



R&D Landscape Survey 2022/ 2023

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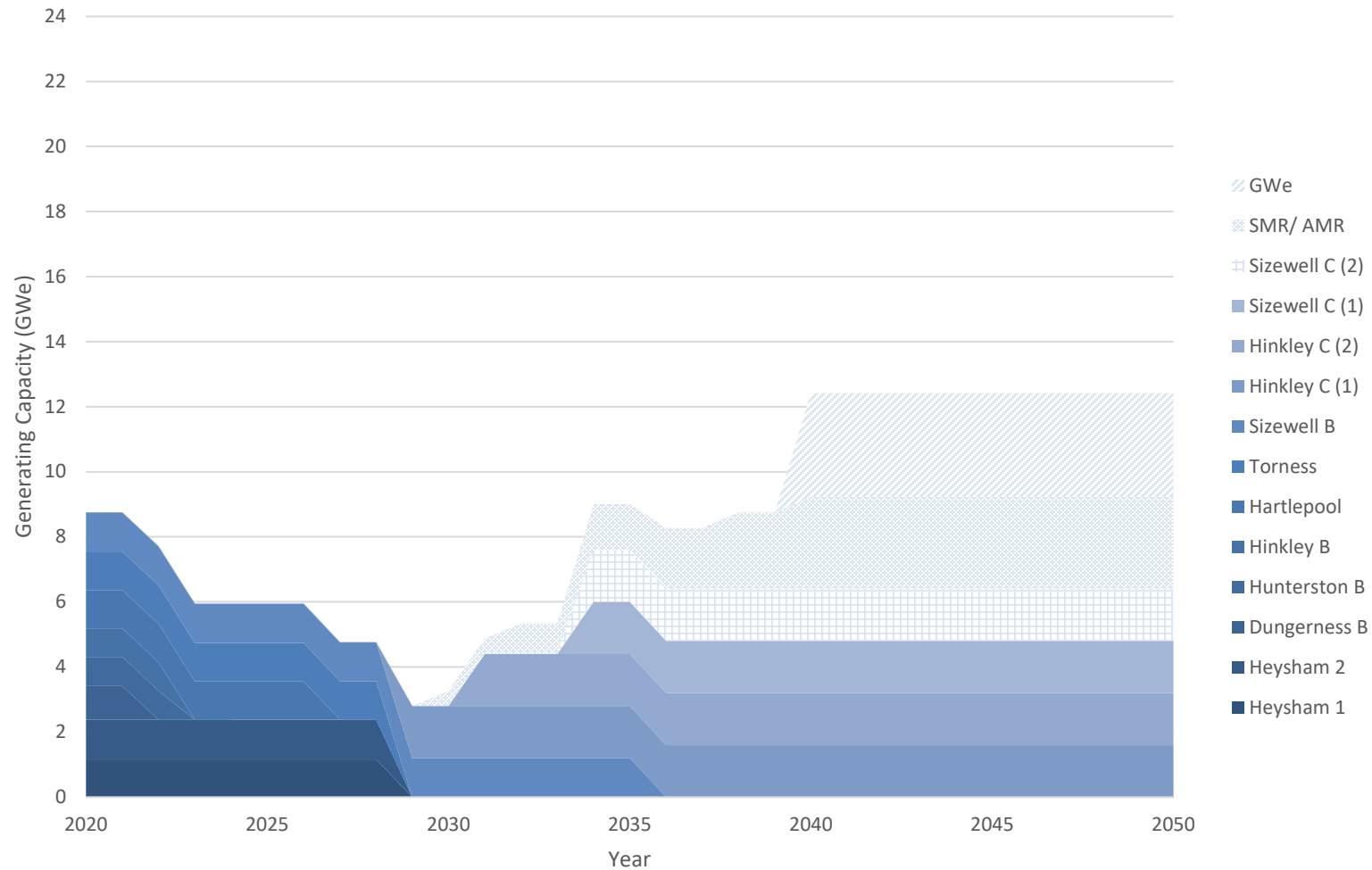
Overview

Following previous reviews undertaken in 2013, 2017 & 2020 new research provided insights into the civil nuclear (fission) landscape in FY 2022-23. This has allowed comparison on the impact and progression of nuclear R&D within the UK overtime including:

- Amount of money spent on nuclear R&D overtime
- Areas of focus for research activities in 2022/23
- Investment by organisations working on nuclear fission projects in terms of people & skills
- Geographical, or sub-group differences across the UK
- Insight into the facilities used to undertake nuclear R&D
- Organisations reflections and perspectives on the landscape (new)

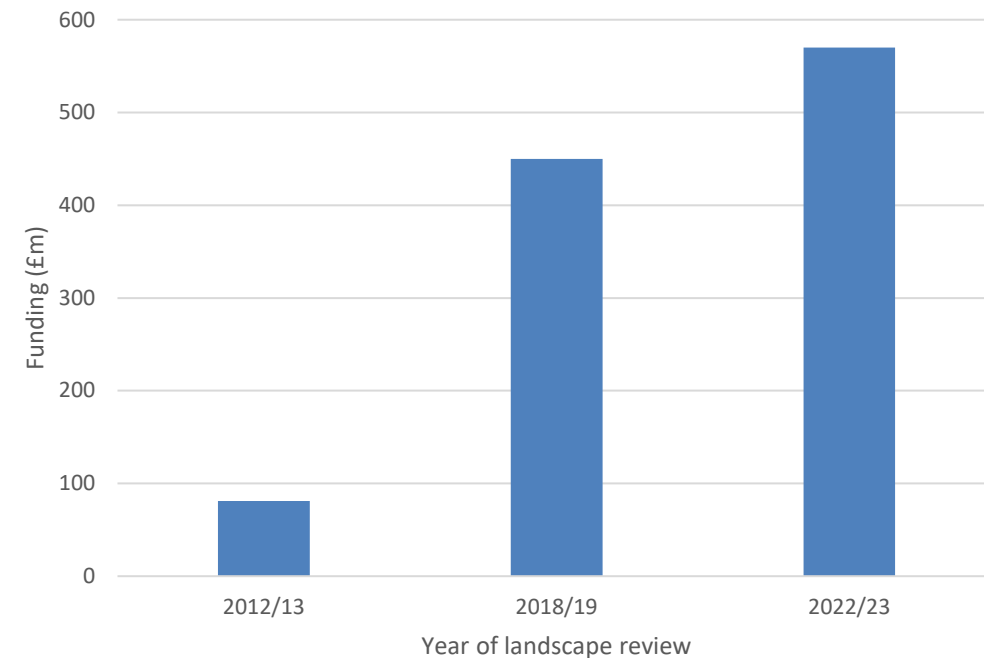


Civil Nuclear Policy Landscape

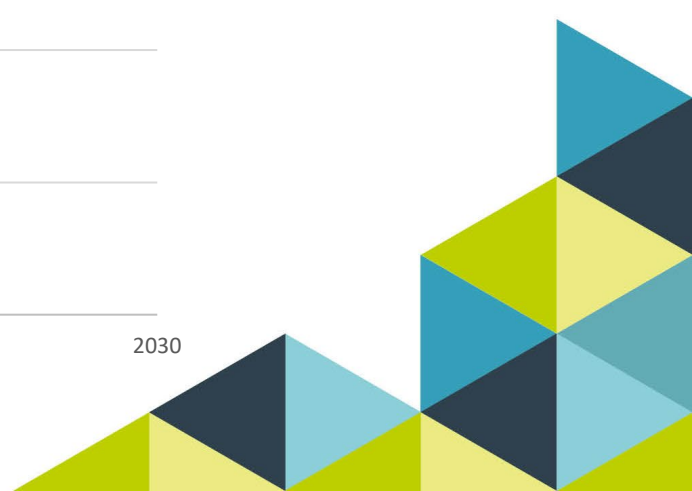
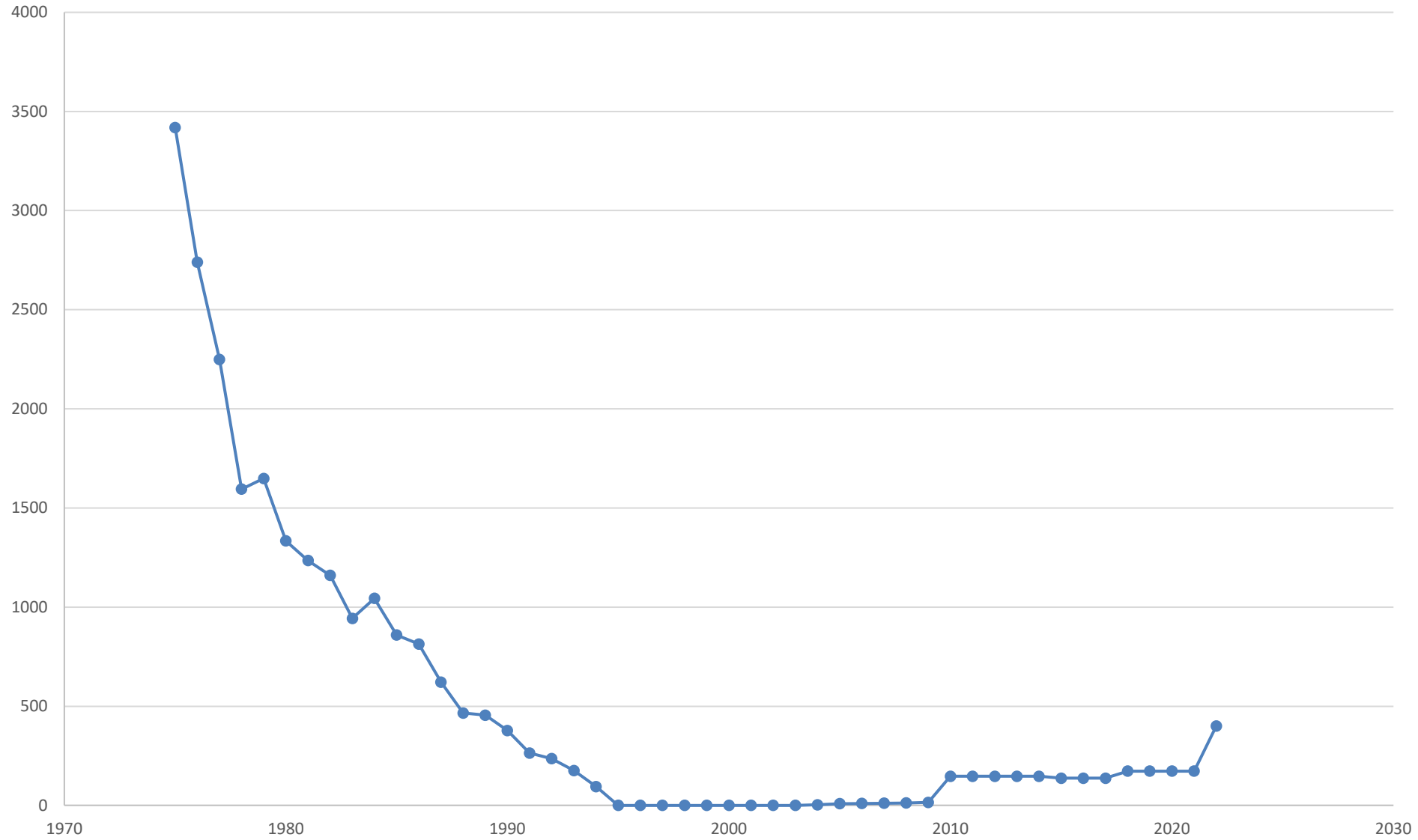


Findings: Funding

- Funding for nuclear R&D in 2022/23 was significantly higher than the last review (by approx. 40%)
- Research suggests funding was in the order of £570m
- Headline spend by organisation type suggests similar funding levels for universities, higher funding for industry/ national labs which has flowed down into a much more diverse and wide-spread supply chain than previous
- Significant increase in R&D especially given the socio-economic landscape (Brexit, COVID, high inflation rates, competing industries etc.)



Funding (£m) inflation corrected to 2022



Staffing and recruitment

In 2022/23 there were 3805 people undertaking civil nuclear R&D in the UK

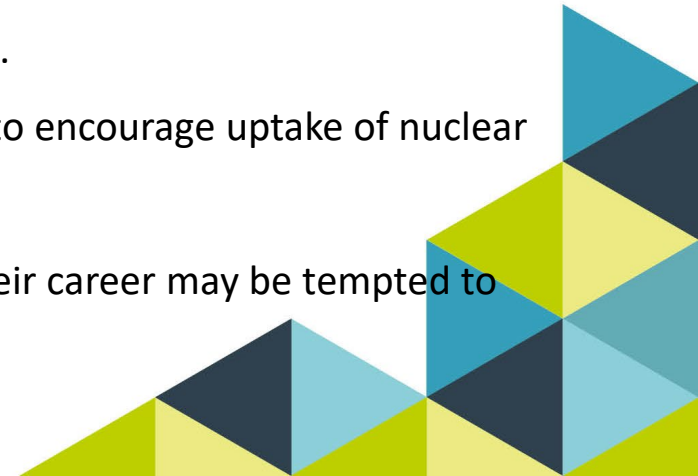
This is similar to the figure quoted in 2018/19 where 3719 FTE were employed.

Number in academia are down in this review compared to previous (962 FTE 2023 compared to 1237)

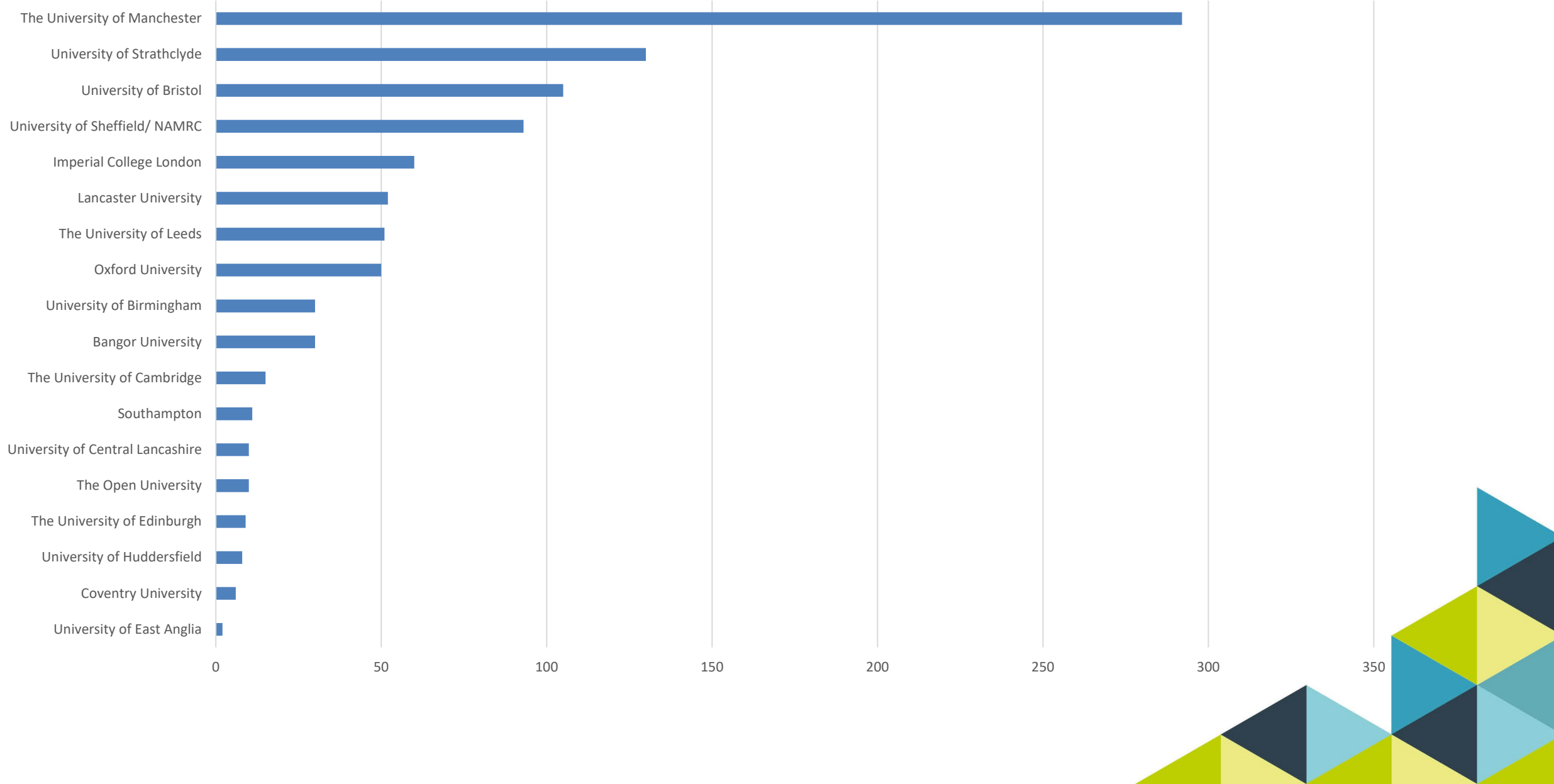
Numbers in industry are up in this review compared to previous (1536 FTE 2023 compared to 944)

There is a recognition that many experts in the sector are close to retirement age, and that industry needs to step up recruitment efforts to secure the next generation of nuclear experts

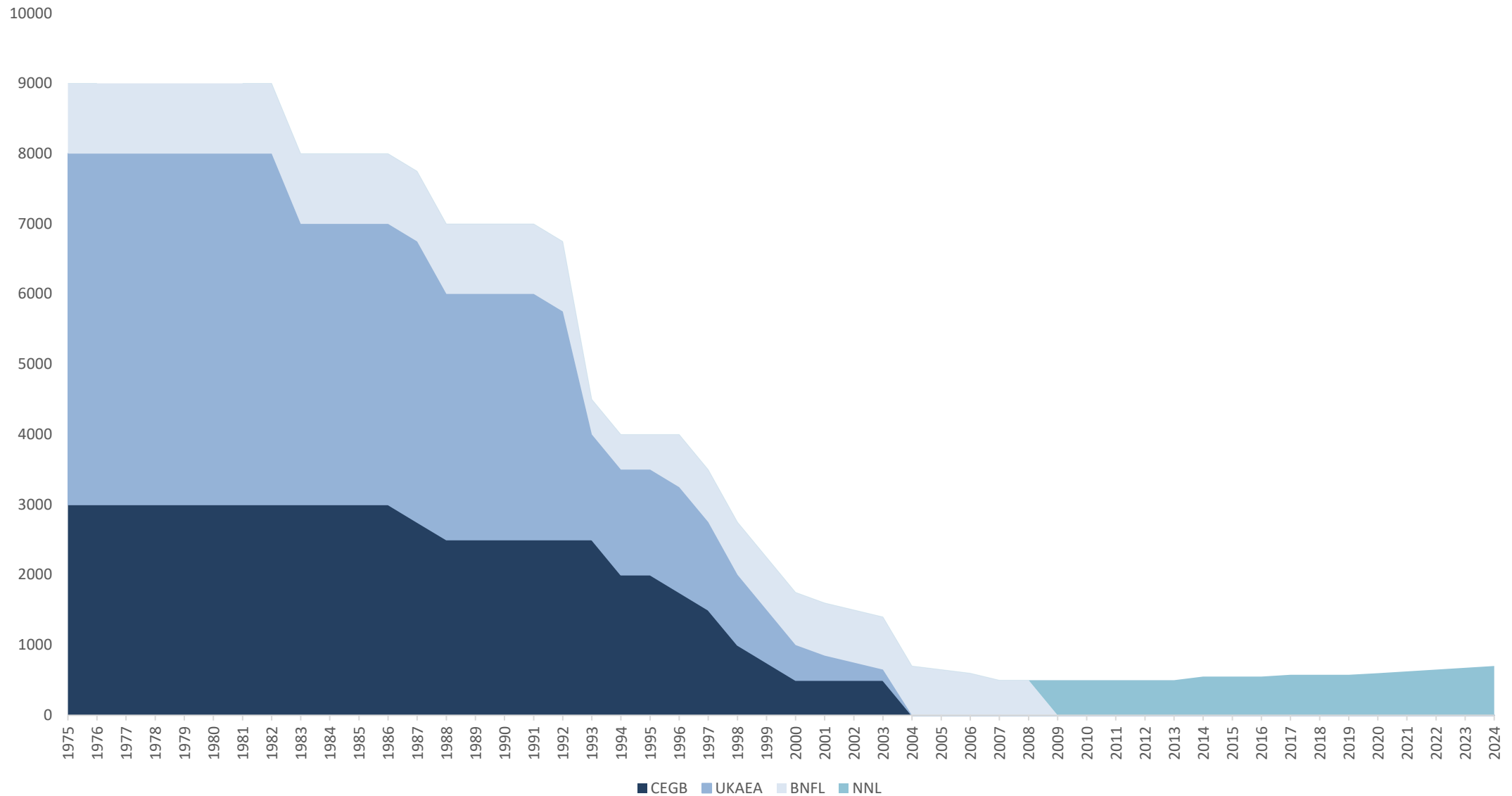
- Some urge the sector to be creative in approach to fulfilling capacity (e.g. to keep older workers on part time after they would typically have required, or to quickly upskill individuals that have similar skills but work outside of nuclear)
- Some have concerns that a drop in academic funding could impact the pipeline of expertise.
- Many recognise that there should be better collaboration between industry and academia to encourage uptake of nuclear as a career.
- Consistency of funding is again seen as a threat, as some worry that those at the start of their career may be tempted to leave the UK or the sector due to the lack of a stable career.



Number Of Employees Working On Nuclear Research and Development



Government R&D staff levels over time



Facilities

Four in five (81%) say that new facilities are needed to undertake future R&D in the UK Majority of respondents said NNUF was a great asset to the sector and wanted to ensure it continued

- The most often mentioned facilities needed for future R&D are 1) NNUF 2) research reactors and 3) test reactors.
- Respondents also mention facilities for research on decommissioning and storage- particularly active handling/ hot cells. As well as Next Generation Pulsed Power Machines, access to thermal neutron source and high luminosity gamma sources.

“We cannot develop nuclear capability without a **dedicated Research and/or Test reactor**; access to JH reactor is not enough.”

“**A research reactor is needed** for materials and component testing. And it can be used for training.”

“More dedicated and connected national assets established in the proximity of key nuclear sites would be highly desirable. A **connected network of decommissioning R&D assets, coordinated through a national hub** would have the potential to achieve major savings from the public purse and enhance the UK's position of global excellence into decommissioning R&D.”



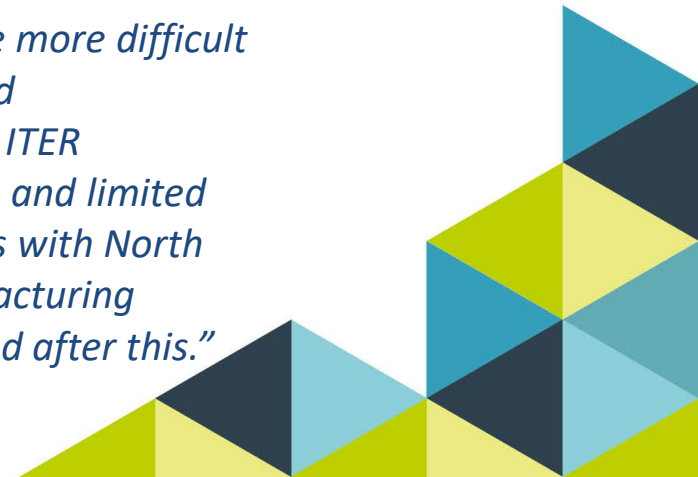
Collaboration

The sector feel that they have a common purpose, face shared challenges and that they should be 'rowing in the same direction'

- Individuals from across the sector feel they should collaborate and work in a more 'joined up way' but need Government help to do this.
- They recognise that there are barriers to collaboration and knowledge sharing (e.g. competition law) & pressure from parent bodies but on the whole want to try to overcome these, they just don't know how
- Common feeling that Government should create an environment in which collaboration is encouraged, but that each different actor has a role to play.

"Nuclear activities are poorly connected. The community is small enough in the UK for everyone to work closely together on delivering the nuclear project. This would help focus on the key gaps in skills, capabilities and manufacturing / engineering technologies that are sector-wide, and break down silos."

"Collaboration is occurring but has become more difficult and occurs in retrospect instead of planned programmes. For 2023, the EURATOM and ITER programmes were difficult to engage with, and limited R&D activities replaced these. Programmes with North America in materials and advanced manufacturing started to progress prior to 2019 and stalled after this."



The sector is very confident in its ability to innovate

Qualitatively, respondents feel the sector, both academically and in industry is strong in its scientific capabilities and in its ambition to innovate within the sector.

Three in four (74%) think the UK nuclear sector is 'Good' or 'Very good' at deepening and developing knowledge through R&D facilities

What is currently in place?

- A strong knowledge base, with increased knowledge growth and new ideas (noted through CDT program and more PhDs)
- Working partnerships with industry (though note through existing relationships)

"We have some of the best nuclear scientists, even thinking on a global scale."

"We're a small country but that means we need to be clever and get the best out of what we've got."

What is needed to improve?

- A desire for testing facilities in the UK – currently use testing facilities abroad

"So we've got a wonderful research materials community in the UK so we can develop new nuclear materials but we have no idea how they actually perform."

Outputs

19%

One in five think the UK nuclear sector is 'Good' or 'Very good' at raising necessary financial resource to do research

26%

One in four think the UK nuclear sector is 'Good' or 'Very good' at recruiting people resources needed for R&D in a timely manner

81%

Four in five say that more or better collaboration is required to advance R&D in the UK

81%

Four in five also say that new facilities are needed to undertake future R&D in the UK and that there is too much pressure on some niche specific facilities to do the range of R&D work required for an advanced fuel programme.

