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FUELLING THE CORE:

Apprenticeships, Industrial Strategy, and the Derby Nuclear Skills Academy

A Report by the Lifelong Education Institute

Lifelong Education Institute

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INTRODUCTION

This report explores the development of a Nuclear Skills Academy, which has been established to meet the training and skills needs of the city of Derby's burgeoning nuclear engineering industry. This is a joint initiative between local industry leader Rolls-Royce PLC and the University of Derby, focused on the needs of Rolls-Royce Submarines Ltd, the division responsible for designing and manufacturing propulsion systems for Britain's fleet of nuclear submarines.

The Nuclear Skills Academy (NSA) was launched in September 2022, which is only slightly more than three years ago, but light years away in terms of the political environment in which it was conceived. Liz Truss had just started her brief tenure as Prime Minister. The Russian invasion of Ukraine had begun only a few months beforehand, and defence was not high on the political agenda. The Conservative Government's Industrial Strategy, developed during Theresa May's premiership, was languishing in the political long grass, with no sign of any active implementation. Devolution – including devolution of Adult Education budgets - was proceeding at a slow pace. Skills policy was almost entirely focused on higher education, through the rapid growth of degree apprenticeships and the work beginning on the Lifelong Learning Entitlement, following the passage of the Skills and Post-16 Education Act 2022. At the time of its inception, the NSA was a development grounded in the local skills ecosystem around Derby, not a response to any specific national government initiative.

Fast forward to 2026, and the Academy finds itself at the centre of a vortex of rapidly evolving government policies. The arrival of a Labour Government following the general election of 2024 has already resulted in a new Industrial Strategy with a strong focus on the Nuclear and Defence

sectors, a major acceleration of skills devolution, a much more interventionist apprenticeship strategy, with the promise of a more flexible system under a Growth and Skills Levy, and the creation of Skills England as a national coordinating body. The transfer of responsibility for Adult Skills and apprenticeship policy to the Department for Work and Pensions has added a new dimension to the implementation of the Government's agenda in this area, as will the many proposals in the Post-16 Education and Skills White Paper.

The Nuclear Skills Academy is a pioneering model that demonstrates in practice how national and regional skills needs can be addressed in the context of a skills policy landscape going through major changes under a new government. What lessons can be drawn by institutions and policymakers across the UK from the experience of Derby? To what extent can this local model be replicated in other parts of the country and other strategic industry sectors? What changes to the funding and regulatory system in England would support the further development of this approach in future? And what impact will the reform of the Apprenticeship Levy have on initiatives such as the Nuclear Skills Academy?

With these questions in mind, the report focuses on three key issues:

- The role of apprenticeships – including Higher and Degree apprenticeships – in providing a sustainable framework for skills development.
- The crucial importance of place-based partnerships, primarily between training providers and employers, but also involving local government and a range of other stakeholders, and the factors that contribute to their success.
- The potential role of the UK's modern industrial strategy in supporting and replicating this kind of large-scale local skills initiative.

To address each issue, we have provided a summary of the evolving national policy context to help clarify the opportunities and challenges the Nuclear Academy partnership has faced, and to identify the extent to which this model might provide a template for other similar initiatives across the country. Our findings are mixed; while the architecture of the Nuclear Skills Academy is very well suited to the requirements of a specific industry in a specific location, like most place-based initiatives, this does not necessarily mean it can readily be replicated at scale across the country and in different industry sectors. Nevertheless, many of its core features represent best practice in the design and delivery of highly effective industry training solutions.

THE APPRENTICESHIPS SYSTEM

The apprenticeship system is very well adapted to the needs of this particular project, because the nuclear industry, as exemplified by Rolls-Royce, has all the features of the traditional industries apprenticeships historically served well. The sector is made up of predominantly large companies, operating in a market that is relatively stable and has good prospects for growth and development because of its strategic importance in relation to both defence and the drive to Net Zero. It offers a high volume of secure full-time jobs with long-term employment prospects and clear career development pathways. Successful employees need high levels of skills, so the availability of higher and degree apprenticeships, and of a provider with extensive experience in delivering them, is a critical success factor.

However, a potential risk has emerged due to the current concern that there is a growing imbalance between higher apprenticeships and those at a lower level, which needs to be corrected in order to widen opportunities for young apprentices at lower levels. The decision has already been made that Level 7 apprenticeships will be ineligible for funding from the start of 2026; any further restrictions on the volume and scope of higher and degree apprenticeships would present a significant risk to the Nuclear Academy model.

Access to opportunity is high on the Government's agenda, and there has been a long-standing concern that the apprenticeship system is not as inclusive as it should be. The Nuclear Skills Academy has been relatively successful in recruiting a wide range of applicants and demonstrates that with the right recruitment strategies, it is perfectly possible to recruit high-level technical skills trainees while enhancing the equality and diversity profile of the workforce.

It is clear that the current design of apprenticeships places limits on the ability to replicate this model in other sectors. While a skill development scheme based on apprenticeships would have every chance in industries which share the features of the nuclear sector – for example, Aerospace or Life Sciences – success in other strategically important sectors, such as Creative Industries, Digital Technologies and Construction, would require a significantly different approach with new and different design features.

INDUSTRIAL STRATEGY

The UK's Modern Industrial Strategy, published in June 2025, has very clearly identified the Nuclear and Defence sectors as priorities. Against a background of rising geopolitical tensions and the continuing war in Ukraine, we are promised a specific Defence Industry Strategy in the near future, which, along with initiatives in advanced manufacturing, digital skills and nuclear technology, will potentially turbo-charge investment in skills. But ensuring a productive return on this investment will require a significant overhaul of our education and skills system.

THE IS-8 INDUSTRIAL STRATEGY GROWTH-DRIVING SECTORS

- Advanced Manufacturing
- Clean Energy Industries
- Creative Industries
- Defence
- Digital and Technologies
- Financial Services
- Life Sciences
- Professional and Business Services

The new industrial strategy acknowledges the key problem: "businesses have told us that the skills system is not meeting their needs, with not enough of the flexibility they require to build a modern workforce, equipped with the right skills"[1], and points to the future role of Skills England in managing this challenge. However, with Skills England still under construction, and radical devolution proposals now being implemented, the precise mechanisms through which the Government will balance regional and national priorities remain unclear.

Thankfully for the future of Derby's Nuclear Academy the nuclear industry is sufficiently well clustered

in locations across the UK, has a well-developed industry infrastructure with a relatively small number of big players, and has a clear understanding of its future skills needs, which should enable it to take full advantage of the support being promised through the new industrial strategy. But here, the detailed roll-out of national industry and skills policies will play a crucial role. As with the apprenticeship system, the UK's industrial strategy will need careful implementation to support a nuclear sector that has a footprint in overlapping priority growth sectors, and flexibility will be the key to success.

RECOMMENDATIONS FOR GOVERNMENT:

1. Continue to support Higher and Degree Apprenticeships as a key component of England's apprenticeship system.
2. Prioritise apprenticeship funding to address recruitment and skills shortages and consider alternative ways to incentivise employers to invest more in workforce development and in-house training to raise productivity.
3. To widen access for young people and alleviate pressure on the apprenticeship budget, progressively take apprenticeship funding for 16–19-year-olds out of the apprenticeship levy system, starting by directly funding all intermediate (Level 2) young apprentices.
4. Mandate Skills England to simplify the administrative and regulatory framework around higher and degree apprenticeships, through streamlining the apprenticeship design and approval process and reducing Ofsted's role in inspecting apprenticeship provision.
5. Develop mechanisms to match the classification of apprenticeship subject areas to priority industry sectors to enable effective evaluation of the scope, relevance and impact of apprenticeships in each sector.
6. Through the Growth and Skills Levy, develop a toolkit of shorter, more flexible workforce training strategies, including shorter courses, modular programmes, and online delivery.
7. Move away from LSIPs by supporting Skills England, in partnership with Mayoral Combined Authorities, to develop Regional Education Partnerships that include universities.
8. As part of Higher Education reform, introduce tangible financial incentives for universities to engage actively in local and regional skills partnerships.

RECOMMENDATIONS FOR THE UNIVERSITY OF DERBY:

1. Continue to play an active role in local skills partnerships and play a leading role in the development of the future regional skills partnerships envisaged by Skills England.
2. Raise the profile of the Nuclear Skills Academy as an exemplar of how Higher and Degree Apprenticeship funding can be used to support the Modern Industrial Strategy while at the same time promoting access, equality, and inclusion.

1. INTRODUCTION

BRITAIN'S NUCLEAR INDUSTRY

After lying fallow for a lengthy period, Britain's nuclear industry is developing and expanding rapidly. This is in part due to growing concerns about the UK's defence capability in the face of an escalation in global conflicts and a proliferation of threats from countries opposed to Western liberal democratic values. But it is also driven by concerns over the environment. Successive governments have signed up to a commitment to switch to an economy based on renewable energy rather than fossil fuels, and the new Government has promised to accelerate this transition. The second of Labour's five missions is to "make Britain a clean energy superpower through delivering clean power by 2030 and accelerating to net zero". Hence, despite its intrinsic health and safety challenges, nuclear power is now widely seen as a vital resource. The development of new nuclear power stations, including a new generation of small modular reactors, is central to the UK's current Green Energy strategy.

But after decades of inertia, achieving nuclear industry expansion at pace is far from straightforward, not least because of the challenge of building a skilled workforce. Industry experts estimate that we need an additional 46,000 nuclear engineers by 2030 and that there is overall a need for 350,000 new skilled recruits in disciplines such as project management, civil engineering and IT over the next twenty years to meet the demand[2].

FIGURE 1: UK'S KEY NUCLEAR SITES (FROM "THE UK'S NUCLEAR HISTORY, WWW.GOV.UK, JAN 2018)

According to the most recent assessment of the UK's nuclear workforce, based on 2024 data, it currently employs 97,000 people, half in the civil nuclear sector, half in defence[3]. The majority are male, with only 22% women, 5% Black and ethnic minority, and 8.5% declaring a disability. The industry has long recognised the importance of widening the diversity of the workforce, especially given the challenge of recruiting for expansion. The number employed in the nuclear industry is projected to grow by 20% to reach 120,000 by 2030, with the majority working in the defence sector, which is projected to move from employing 50% to employing 66% of the total by this time.

THE UNIVERSITY OF DERBY AND ROLLS-ROYCE

The partnership between Rolls-Royce PLC – now one of the country's leading nuclear engineering and manufacturing companies – and the University of Derby has the potential to play a critical role in meeting this skills challenge. Their work in developing and launching a Nuclear Skills Academy is a pioneering initiative and an instructive example of how new forms of industry/education collaboration can address

not only regional but also national skills shortages. It touches on two key themes that are currently the focus of much debate: the role of apprenticeships and of industrial strategy.

Built around the delivery of apprenticeship training at scale, the Nuclear Skills Academy is a living test of the extent to which the apprenticeship model offers a sustainable mechanism through which skill and talent pipelines can be opened up. Given the current controversy over the future direction of apprenticeship policy, it provides a case study of what works and what might be the limitations of the complexities of apprenticeship funding, design, and regulation. It also poses questions and offers possible solutions around the way in which a national industrial strategy might relate to regional priorities and provide tangible support to place-based economic development projects.

With the assistance of Derby University colleagues, this report explores in depth the factors that helped create the Nuclear Skills Academy, the processes involved in forging and maintaining the partnership between the university and Rolls-Royce, and its success so far in achieving its goals.

2. POLICY CONTEXT: APPRENTICESHIPS AND INDUSTRIAL STRATEGY IN THE UK

2.1 APPRENTICESHIPS

A BRIEF HISTORY

Apprenticeships have a long history in the UK, stretching back hundreds of years. But in the modern era, the introduction of Modern Apprenticeships in 1994 was the moment when a system in danger of failing to keep up with modern quality requirements was refurbished to meet the demands of a rapidly changing economy and education system. The reforms established the basic components of UK apprenticeships which are still in place today: the involvement of industry experts in the design of apprenticeship frameworks, the combination of knowledge-based study with applied learning in the workplace, and the requirement for apprentices to develop wider skills, such as specified levels of literacy and numeracy, and an understanding of employment rights and responsibilities.

Over the past twenty years, the apprenticeship system has been reformed at regular intervals to address concerns over access and quality, to raise its profile, and to maximise its scope and impact. The Apprenticeships, Skills, Children and Learning Act of 2009 introduced a statutory entitlement to apprenticeships for young people and led to the creation of the National Apprenticeship Service, a dedicated body tasked with overseeing apprenticeship delivery, providing support to employers and apprentices, and promoting apprenticeships.

Subsequently, over the years, other changes were made, all of which are still in place today. Apprenticeship frameworks became standards, a minimum duration of twelve months was established, and strict rules were introduced to ensure that at least 20% of an apprenticeship is spent on "off-the-job" training. End Point Assessment by a body independent of the training provider became mandatory before apprentices could gain their qualification.

In 2015, the Government transformed the funding of apprenticeships by introducing the Apprenticeship Levy. The Levy, which came into effect in 2017, required all UK employers with an annual pay bill of over £3 million to invest in apprenticeship training through a compulsory contribution set at 0.5% of the employer's pay bill, a tax which can only be reclaimed by companies if they employ sufficient numbers of apprentices. Apart from introducing a completely new method of funding apprenticeships, the Levy also ensured that large employers had financial "skin in the game", giving them a direct commercial motivation for getting involved with the recruitment and training of apprentices.

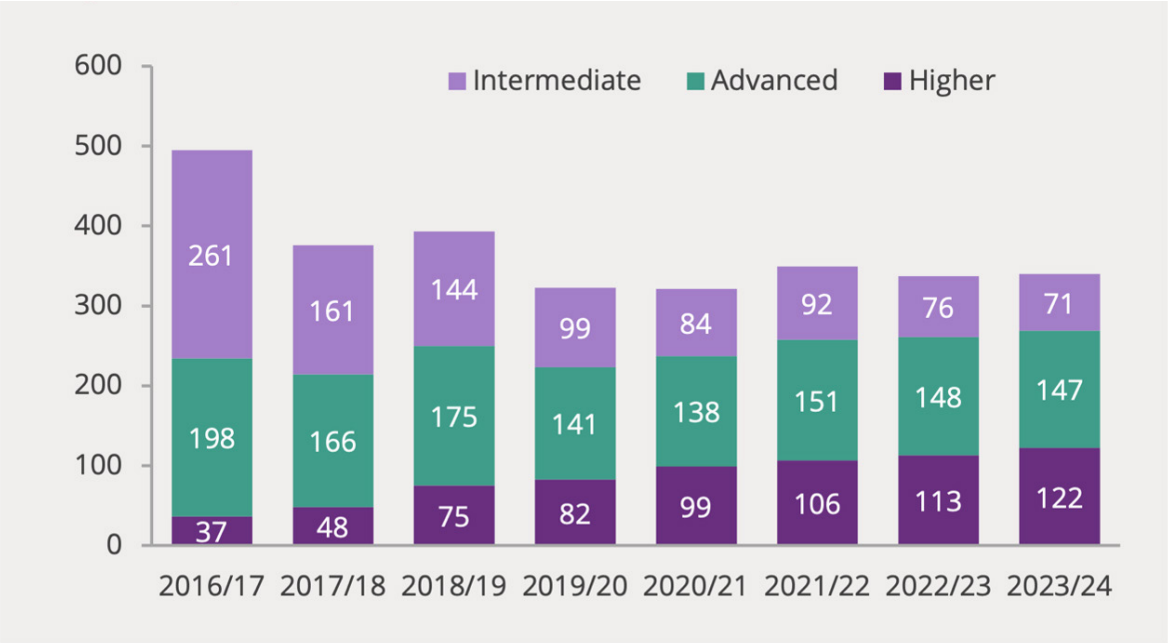
In the same year, degree apprenticeships were introduced alongside the traditional lower-level standards. These have proved extraordinarily popular, with higher and degree apprenticeship starts rising from 13% in 2017/18 to 36% in 2023/24 (15% at degree level), an upward trend that is still continuing strongly. While Advanced Level starts have remained relatively stable, staying at just over 40%, Intermediate Level starts have declined steadily from 374,400 in 2017/18 to 142,700 in 2023/24, and now represent only 21% of the total. The rise in higher and degree apprenticeships has also changed the age profile of apprentices; while 28.4% were under 19 in 2017/18, by 2023/24 this was only 23.2%, a 5% decline over the period, with 25,000 fewer annual starts for young apprentices than five years ago[4].

APPRENTICESHIP LEVELS

NAME	LEVEL	EQUIVALENT EDUCATIONAL LEVEL
Intermediate	2	5 GCSE passes at grades 9-4
Advanced	3	2 A Level passes
Higher	4-6	Foundation Degree and above

These changes were until recently overseen by the Institute for Apprenticeships and Technical Education (IfATE), which was established in 2017, taking over most of the functions of the National Apprenticeship Service. The IfATE played an important role in driving forward apprenticeship reform, working closely with employers, training providers, and professional bodies to develop new apprenticeship standards that better reflected industry needs and standards.

FIGURE 2: APPRENTICESHIP STARTS BY LEVEL IN ENGLAND (2016/17 TO 2023/24, THOUSANDS)



Source: GOV.UK, Apprenticeships: Academic Year 2023/24, Underlying Starts Data

CURRENT CHANGES

We are now on the cusp of another major change in the national apprenticeships system, with a Labour Government already embarked on reform. The move to a new Growth and Skills Levy to replace the existing Apprenticeship Levy - now under the auspices of the Department for Work and Pensions (DWP) - is the most important of the changes in progress. IfATE has been wound up and its responsibilities transferred to a brand-new body, Skills England.

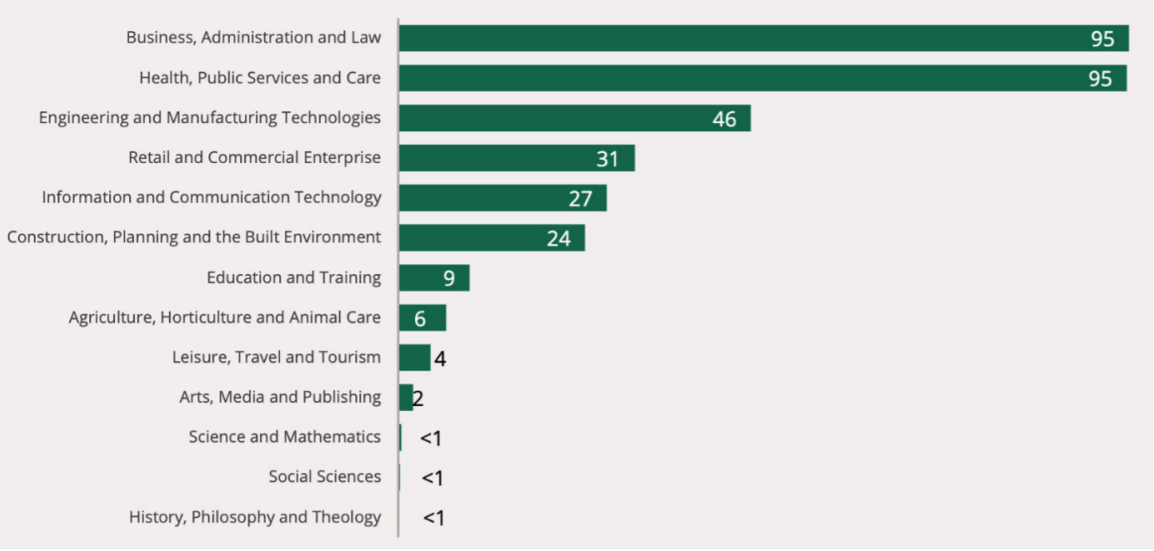
It is too early to evaluate the practical impact of these recent reforms, but the intensity of debate that surrounds them is a sign of just how politically important the future of the apprenticeship system has become. The last 20 years have seen a remarkable upsurge in the public profile of Apprenticeships and their popularity across the political spectrum. All political parties in all four UK nations are enthusiastic in their support for them, and an opinion survey conducted by Public First before the 2024 general election found that "apprenticeships for skilled and technical work" was the public's number one education policy priority for the next government, by a very wide margin[5].

But despite the generally positive mood, there has been a rising chorus of concern about many of the key features of the apprenticeship system as it has evolved, particularly since the key reforms introduced from 2015 onwards. At one level, these concerns are focused on the many practical problems associated with the operation of a complex delivery system, but deeper concerns have emerged about the overall design of the system and how apprenticeships relate to other elements of the UK's education and skills landscape. The arguments centre around three problematic issues: the impact of the Levy, the balance between higher and lower levels of provision, and competing conceptions of the fundamental role of apprenticeships within the wider technical and vocational education system.

THE APPRENTICESHIP LEVY SYSTEM

The apprenticeship levy system has certainly had a major impact on the post-16 education and skills landscape, not least because it has successfully injected a major new source of income into work-based training. But it has proved controversial, and is considered by many to be incentivising employers to consider their training needs from too narrow a perspective, therefore failing to address the most important national skills priorities. This is illustrated by the fact that apprenticeships in two subject sectors – Business and Administration, and Health, Public Services and Care – represented nearly 55% of total starts in 2023/24, in sharp contrast to strategically important sectors such as Engineering and Manufacturing (15%), Digital (8%) and Construction (7%)[6]. In most of the growth sectors identified by the Modern Industrial Strategy, apprenticeship training currently makes only a small contribution to workplace skills strategies.

FIGURE 3: APPRENTICESHIP STARTS IN ENGLAND BY SSA TIER 1 (2023/24, THOUSANDS)

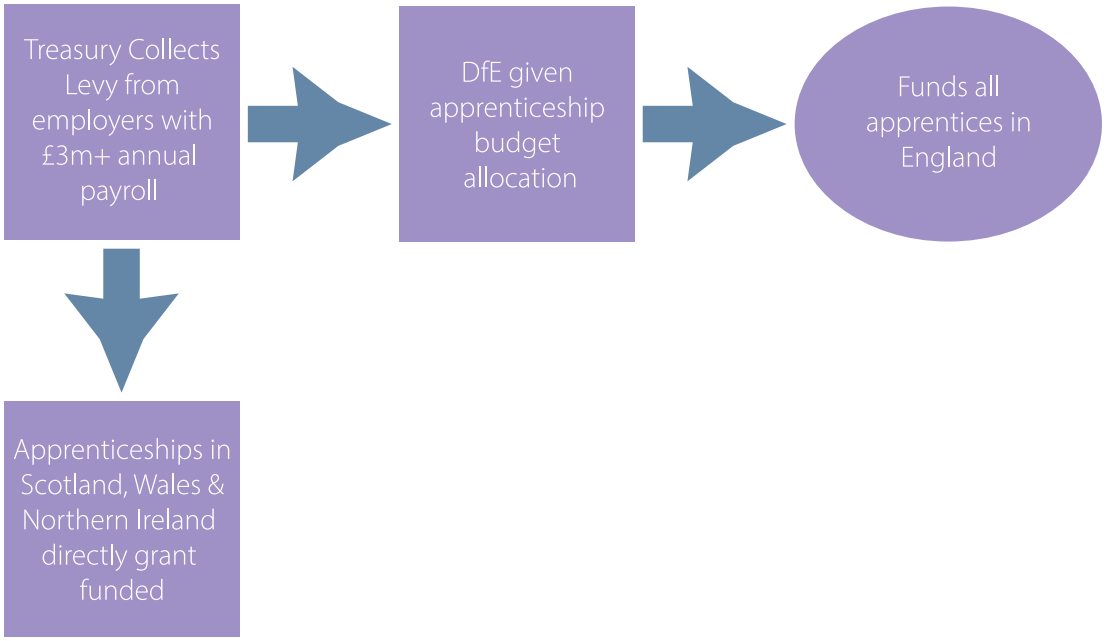


Source: GOV.UK, Apprenticeships: Academic Year 2023/24, Underlying Starts Data

Many employers view the Levy as simply another tax on business, and while many employers of graduates have feasted on degree apprenticeships, companies who predominantly employ staff who are in lower-skilled roles – in sectors such as retail, logistics, and food production – have found it impossible to take advantage of Levy funding. In those industry sectors where standard employment contracts are not the norm, the insistence that apprentices have to be employed full-time for a minimum of twelve months has proved to be an insurmountable hurdle, and efforts to introduce flexible schemes where apprentices can be shared between several employers have foundered. Meanwhile, since the levy was introduced, the number of apprenticeship starts has fallen by 31% overall, but despite this, the budget for apprenticeships is approaching the point where funding is at risk of being insufficient to meet demand.

The Levy system is unlike any other funding system for education and is unique in being directly under the control of the Treasury. The way in which it works is quite complicated, and tracking detailed trends in expenditure is far from straightforward.

The Treasury collects Levy receipts, which reached £4.1billion during the 2024/25 financial year, and according to the Office for Budget Responsibility forecasts, will reach £4.2billion in 2025/26, as inflation drives an increase in employers' wage costs. The DfE budget for apprenticeship delivery is then allocated by the Treasury based on the total amount of Levy receipts and has increased to £3.075billion in FY 2025/26[7]. This pays not only for Levy-funded training in England, but also for 95% of the cost of apprentices taken on by English SMEs. Apprenticeships managed by the devolved governments in Scotland, Wales and Northern Ireland are separately funded by the Treasury through direct grants.



The gap between Levy income and the DfE's (soon to be the DWP's) apprenticeship budget has been criticised for being too large, but has recently reduced to £600m, of which close to 100% is now being utilised. But the growth of degree apprenticeships is absorbing an ever-increasing proportion of the funding available[8]. The pressure on the overall apprenticeship budget has led to escalating calls for spending to be rationed, with some calling for limits on the funding of degree apprenticeships, or on the age of apprentices, or for apprenticeship starts to be restricted only to new employees. Others have called for funding for under-19s, or for intermediate apprentices, or both, to be ring-fenced.

One of the Government's main arguments for the recent decision to stop funding Level 7 (master's level) apprenticeships is to enable more funding to be directed to lower-level apprenticeships, an estimated extra £400m from FY 2026/27. This will certainly provide some welcome headroom for expansion of intermediate and advanced apprenticeships, but with the growth of higher and degree apprenticeships showing no sign of slowing down, the problem of apprenticeship funding reaching its budget limit is going to recur quite soon, and further restrictions may be necessary to ensure the sustainability of the system.

The levy system only applies to the small minority of UK employers who have an annual pay bill of £3 million or more; small and medium employers are directly funded by the government, having to contribute 5% of the annual cost of taking on an apprentice. There have been persistent complaints that the process of accessing apprenticeship funding is too time-consuming and bureaucratic for SMEs, who don't have specialist HR departments and often have limited capacity for supervising and supporting trainees within the business. In 2019, the Federation of Small Businesses reported that 27% of their members felt that the apprenticeship reforms had "harmed their business" and that the rising cost of recruiting apprentices, combined with the requirement for formal off-the-job training equivalent to at least one day a week, was a major disincentive[9].

THE BALANCE OF APPRENTICESHIP PROVISION

The Nuclear Skills Academy would not have been possible without degree apprenticeships. Their growth was unconditionally celebrated by Skills Ministers under the Johnson and Sunak Governments, memorably by the then Skills Minister Robert Halfon, who declared in 2023 that his two favourite words were "degree" and "apprenticeship". But the fear that this expansion was reducing opportunities for younger, less experienced students trying to gain a foothold on the career ladder, has created a backlash against them. The announcement by the Prime Minister in September 2024 of severe restrictions on the funding of Level 7 (post-graduate) apprenticeships was justified by the need for "employers to rebalance their funding for apprenticeships…to invest in younger workers".

A report published by the Social Market Foundation ("A Level of Uncertainty: How to resolve the debate over the future of Level 7 apprenticeships", Tom Richmond, Jan 2025) noted that one in six new apprentices

are now university graduates who already have degrees and called for a complete ban on graduates being able to access publicly funded apprenticeships. This was followed immediately by a report by the original architect of the levy system and leading expert on post-16 education policy, Baroness Alison Wolf (Revitalising apprenticeships: A blueprint for skills and economic growth, Social Market Foundation, January 2025), which went further, not only agreeing with the idea of taking degree apprenticeships out of levy funding completely, but urging the Government to ring-fence apprenticeship funding for young apprentices, to only part-fund over 25s, and to devolve large parts of the system to mayoral combined authorities. This is because "Apprenticeship must be restored to its provenly effective and historic role, providing young people with in-depth training in a new occupation."[10]

While these recommendations have been vigorously criticised by many in the sector, there's little doubt that the Labour Government, with its strong focus on widening opportunities for disadvantaged groups within the UK, is broadly sympathetic to the idea of prioritising the needs of young people from low-income backgrounds, as the Level 7 decision illustrates. The planned introduction of a new category of Foundation Apprenticeships specifically tailored to the needs of 16–18-year-olds is further tangible evidence that the Government has been persuaded by the arguments being put forward.

In the context of a renewed emphasis on access and inclusion, the apprenticeship system has for some time, been under critical scrutiny for its track record in recruiting from all sections of the UK's diverse population. The latest data on overall participation indicates that some progress has been made; the number of female apprentices has remained steady at just over 50%, while the proportion from Black and ethnic minority backgrounds has risen slightly to 17.4%, and those with learning difficulties and disabilities have also increased to 16.6%[11]. But the figures vary considerably from sector to sector, with, for example, only around 10% of women taking Engineering apprenticeships. The balance between the role of the apprenticeship system in supporting economic growth and its social role in providing access to opportunity will be a consistent theme for the foreseeable future.

WHAT EXACTLY IS THE ROLE OF APPRENTICESHIPS?

Alison Wolf's trenchant and long-held views are a reminder that, beyond the criticisms of the practical operation of the apprenticeship system, there is another, deeper layer of concern. Many observers of the UK's post-16 education system have commented on the extraordinary level of policy "churn" around technical and vocational education. One recent report listed the 30 significant policy interventions introduced by national governments since 1999: 6 Acts, 9 Reviews, 4 White Papers, 3 Green Papers and 8 major strategy documents[12]. However, the problem is not simply the number of policy initiatives, but the lack of a coherent and consistent strategic framework behind them, which has led to a confusing, fragmented and in some cases contradictory post-16 terrain.

Where do apprenticeships sit within this evolving environment? The answer is now distinctively different in the devolved nations, which have gone down quite separate paths in developing apprenticeships and other technical and professional programmes. But in England in particular, the introduction of T levels, the arrival and departure of traineeships, the introduction of skills boot camps, and the push for Higher Technical Qualifications, have muddied the water as to the distinct place of apprenticeships as a pathway for technical training. At undergraduate level – levels 4 -7 – the options are straightforward: a traditional degree or a degree apprenticeship are the two routes taken by almost all students. But at levels 2-3, the relative merits of different pathways are less clear, and there are now significant variations between UK nations, with under-19s comprising only 23% of apprenticeships in England and Wales, but 37% in Scotland and 52% in Northern Ireland.

This increasingly complex picture makes it hard to identify with any clarity the place of apprenticeships within the UK's vocational and educational skills system. Are they still seen as an alternative pathway to higher skills and better employment for those who are not best suited to progressing down a traditional academic route from school to university, as is the case in countries like Germany and Switzerland, and is the position of experts such as Alison Wolf? Are they now being positioned as the preferred training route for those aspiring to, or already within higher technical and professional occupations? Or are they now a replacement for the in-service training opportunities employers offer to raise workplace performance and productivity and to support career development, as the recently floated idea of "apprenticeship units" being offered through the Growth & Skills Levy seems to indicate?

In practice – in England at least – they are performing all these roles, but this is causing increasing tensions between the design and delivery of programmes for young, inexperienced trainees and older, more experienced professionals. In addition, there is an obvious risk that the finite resource of the apprenticeship levy system is in danger of being stretched beyond capacity, leading to a situation in the not-too-distant future where difficult choices have to be made between the priority given to the various roles that apprenticeships can play as part of a national post-16 education system.

REFORMING THE APPRENTICESHIP SYSTEM

One straightforward way of preserving apprenticeships as a vital first step on the career ladder for school leavers would be to remove funding for 16–19-year-old apprentices from the levy system completely and directly fund them alongside their peers on classroom-based courses. As this may be prohibitively costly in the current government spending climate, a first step could be to directly fund those under 19s on Level 2 (intermediate) apprenticeships, which make up less than half of the approximately 42,000 annual starts in this age category. Funding these students at the current average rate for full-time FE students of £7,350 a year would not only cover the direct costs of apprenticeship training but also provide scope to provide greater support, such as enhanced career support, employability skills, wellbeing and mental resilience to young people who often lack confidence and maturity.

This would free up a significant proportion of the overall apprenticeship budget and be far preferable in the short term to introducing further restrictions on Higher and Degree apprenticeships. Before the defunding decision, a strong case was made for retaining funding for Level 7 apprenticeships in sectors such as accountancy and healthcare, where they form an important part of the skills pipeline, and the case for most Level 4-6 apprenticeships is equally strong, especially when viewed through the lens of Britain's growth and productivity challenge. There is undoubtedly a degree to which the apprenticeship levy is funding in-house training that employers should be investing in, but until a workable alternative model for supporting this kind of workforce upskilling is devised and introduced, it will be important not to throw the baby out with the bathwater by undermining higher-level apprenticeship delivery.

2.2 THE ROLE OF AN INDUSTRIAL STRATEGY

MODERN INDUSTRIAL STRATEGY

The publication of a consultative paper in October 2024, "Invest 2035 – The UK's Modern Industrial Strategy", was the Government's first attempt to produce a national Industrial Strategy since November 2017, when a White Paper, "Industrial Strategy – Building a Britain fit for the future", was published by then Prime Minister Theresa May. Instead, in March 2021, HM Treasury published a new document which was explicitly not badged as an industrial strategy, "Build Back Better – Our plan for growth", with a foreword from Prime Minister Boris Johnson and the Chancellor of the Exchequer, Rishi Sunak. It contained a chapter on skills and included a specific commitment to "take steps to improve the apprenticeship system for employers, through enabling the transfer of unspent levy funds and allowing employers to front-load apprenticeship training".

While these new flexibilities were broadly welcomed and have been adopted by some large employers, they have not had a significant impact, and it was recently revealed that only 2.7% of levy-paying firms actually made any transfers of unspent levy funds in 2022/23. Tinkering at the edges of a fundamentally inflexible system has proved ineffective in raising the volume of apprenticeship starts or increasing the uptake of apprenticeships by SMEs.

A central government-led industrial strategy should enable a more strategic approach to the question of the place of apprenticeships within the employment and skills landscape. By providing greater clarity and direction around the use of apprenticeships and other skills strategies within key growth industries, introducing more systematic mechanisms to match skills supply and demand at sectoral and regional levels, and developing a more structured and consistent system for business–education provider collaboration, the skill strategies that result from the Modern Industrial Strategy published in June 2025 could play a significant role in supporting initiatives such as the Nuclear Skills Academy.

APPRENTICESHIPS AND INDUSTRIAL STRATEGY

The challenge involved in aligning investment in apprenticeships with the UK's strategic growth industries is considerable. The Industrial Strategy prioritises eight "growth-driving" sectors: Advanced Manufacturing, Clean Energy Industries, Creative Industries, Defence, Digital Technologies, Financial Services, Life Sciences, and Professional & Business Services. It also identifies Frontier industries – those at the cutting edge of innovation – and Foundational industries, such as Chemicals and Construction, which provide critical inputs to the eight priority sectors, now labelled as the IS-8. However, as noted above, data on starts for 2023/24 indicates considerable misalignment between those areas where there are high volumes of apprenticeships and the IS-8 sectors, although there are a variety of problems in getting a detailed picture at the granular level of the contribution of apprenticeship training to workforce development.

The problem is a technical one: the definitions used for industrial growth sectors align poorly with the definitions used to track apprenticeship participation, making it hard to evaluate the role of apprenticeships in key sectors. While Life Sciences is undoubtedly a component of Health, Public Services and Care, it is likely to be only a small part, while other subjects, such as Science, will also be relevant. Although we know that Britain's armed forces are amongst the largest employers of apprentices, there is no reliable way of correlating apprenticeship take-up with the needs of the defence industry, which in any case includes many private companies which supply not only the armed services but also other industries. The Industrial Strategy implicitly acknowledges this difficulty by opting to use a mixture of Standard Industrial Classification codes and other data sources to define the various sectors in question, and comments that a great deal of further work will need to be done to arrive at a clear and consistent set of definitions.

Looking specifically at the nuclear industry, it could be classified as part of the Defence sector, the Clean Energy sector, or the Advanced Manufacturing sector. Apprenticeship starts in Clean Energy Industries are likely to be recorded across multiple apprenticeship subject categories, and there is a similar problem with Advanced Manufacturing. In any case, given that nearly half of higher and degree apprenticeships are in Business and Law, we can estimate that at best only 8,700 level 4-7 engineering apprentices start each year, and the figure is likely to be much lower.

In summary, it is clear that while a reinvigorated Industrial Strategy might play a key role in facilitating initiatives such as the Derby Nuclear Skills Academy, there is a lot of work to be done to make this a reality. Two new bodies, the Industrial Strategy Advisory Council and Skills England, will have to work in tandem to find effective ways of identifying skills needs and analysing the extent to which they are being addressed by existing skills supply lines, from apprenticeships to Higher Technical Qualifications to traditional university degrees. They will also have to take into account the geographical footprint of sectors such as the nuclear industry and balance place-based with national requirements.

3. THE NUCLEAR SKILLS ACADEMY

The Nuclear Skills Academy stands at the intersection between the UK's skills policy, industrial strategy and defence capability. Launched in September 2022, it is a dedicated training institute established by the University of Derby and a division of Rolls-Royce plc. It provides apprenticeship training for 200 students a year across all aspects of Rolls-Royce Submarines Ltd (RRSL), including Engineering, Manufacturing, and Business. Based at the Infinity Centre Enterprise Zone in Derby, the Academy is supported by the Nuclear Advanced Manufacturing Research Centre, the National College for Nuclear, and Derby City Council. It received direct funding support from Innovate UK, which awarded a grant of £1.3m to enable the purchase of specialist training equipment and IT facilities.

Image courtesy of the University of Derby

SUCCESS FACTORS

The creation of the NSA in just 8 months – from project inception to opening - demonstrates that in the right circumstances, universities can respond to urgent employer needs at pace and scale. There are a number of critical success factors behind the project's speedy and effective implementation.

First is the distinct organisational culture of the university. With its origins in the middle of the 19th century, the former Derby College of Higher Education became the University of Derby in 1992 and is unusual in having incorporated former FE colleges into its structure. It has a strong focus on technical and vocational education, responding to the needs of its flourishing regional industries such as automotive, railway, and aerospace engineering, which continue to have a strong profile through the presence of companies such as Toyota, Alstom, and Rolls-Royce. The university educates over 2,400 Higher and Degree Apprentices, making it one of the largest apprenticeship providers in the university sector.

The University has committed itself to being "an applied university of today and for tomorrow", a vision embedded in its 2018-30 Strategic Framework. The strategy has at its core a commitment to working with industry to provide innovative solutions, through research expertise, to global sector challenges, and to secure a pipeline of skilled, high-quality talent at all career stages. This has required the university to adopt a proactive approach to working with industry to understand their requirements and create long-term plans to upskill current employees, while responding to current acute shortages. While not limiting itself to any fixed geography, the strategy has a strong place-based focus, recognising that as the only university in Derbyshire, it is an anchor institution for the city region and therefore has a specific role as a civic partner.

Derby has been nationally recognised for its expertise in developing and supporting the workforce of the future, most recently through the award of a Gold rating in the 2023 Teaching Excellence Framework. In addition, the University appears in the Top 20 in the UK for both overall student satisfaction and teaching quality[13]. A key foundational element of this success is the University's commitment to partnership working with industry through its Industry Advisory Boards. This direct engagement with professional bodies and employers ensures that curricula are industry-led, are regularly refreshed, and consequently meet the higher skills needs of students as well as regional and global economies. More than 300 of Derby's programmes confer professional accreditation alongside the University's degree award, with an increasing number offering industry-recognised certification of co-curricular learning.

The second factor is the University's development of a dynamic and responsive framework that enables it to maximise opportunities from innovations in skills delivery, growth in apprenticeships, and alignment with local and national strategies. This has not been easy; addressing the combined need for relevance, pace, and cost-effectiveness has meant rapid development of all aspects of the university's operating model.

Derby's approach to local skills demand–supply matching, including its specific partnership strategy with local and regional employers, has evolved rapidly. Over the last 7 years, the University has supported over 2,000 SMEs and businesses through its Innovation and Research activity, making strategic use of external funding – such as European Regional Development Funding – to generate funds which created a combined value of over £24m that has been reinvested into local business and innovation. Collectively, the University's approach to skills-matching partnerships is based on four core principles:

- Ensuring strategic alignment between the University's expertise and strengths and the partnership opportunities that arise.
- Building relationships that enable a detailed understanding of the needs and requirements of the industry.
- Taking a holistic approach to industry engagement, recognising the interconnectedness of the agendas relating to innovation & research and learning & teaching.
- Being ready and able to respond to opportunity at the pace required.

The third factor is the university's pre-existing relationship with the key partner in the NSA initiative, Rolls-Royce, whose largest global engineering centre has been based within the city of Derby for over 120 years. Since the 1930s, the company's aero-engine manufacturing operations spread to locations across the UK and abroad, while its car production operation was moved out of Derby in 1946, but the city has continued to provide a base for its engineering development, manufacturing, and testing facilities, now called the Derby Production Test Facility, and Rolls-Royce still employs thousands of people in the city. Over decades, the University of Derby has developed numerous contacts and initiatives with the company, so it already had well-established professional relationships and a good understanding of each other's operations. This mature and long-standing relationship greatly facilitated the development of the NSA from 2021 onwards.

Image courtesy of the University of Derby

3.1 DESIGN AND OPERATION

TRAINING DESIGN

Rolls-Royce's base within the city of Derby is home to Rolls-Royce Submarines Ltd (RRSL), whose 4,000 world-class experts design, manufacture, and support the nuclear propulsion technology that powers the Royal Navy's submarines and has maintained the UK's at-sea nuclear deterrent for over 60 years. RRSL has an ambitious growth strategy to consolidate its reputation as a pioneer in delivering innovative power and propulsion solutions. Growth opportunities beyond RRSL's immediate submarine business are focused on the global drive to develop sustainable, small-scale nuclear power and fusion energy generators. However, RRSL recognised that these once-in-a-generation opportunities risk being hampered by an acute skills shortage that threatens to limit the company's ability to take advantage of these business opportunities, and undermine the position of the UK as a global leader of nuclear engineering excellence.

To meet this challenge, Derby University and a dedicated Rolls-Royce team worked in lockstep to mobilise other partners, including the City Council, the National College for Nuclear, and the Nuclear Advanced Manufacturing Research Centre, with each partner contributing their specialist expertise, whether that related to needs within the nuclear industry, physical space, curricula design and development, accreditation or funding. The result is an Academy that delivers apprenticeship provision (including degree apprenticeships) from Levels 3-6 (A-level to degree level). The choice of a model-based around apprenticeships was driven by three key factors:

1. While having an eye on upskilling existing employees where necessary, the clear immediate priority was to greatly increase the number of individuals joining the nuclear industry and therefore requiring intensive initial training.
2. Training related to nuclear engineering is necessarily long and specialist, lending itself to the multi-annual structure of most apprenticeships.
3. The apprenticeship model is perfectly adapted to providing learners with the right combination of robust academic knowledge and practical work-based experience.

The Nuclear Skills Academy takes a holistic approach to its delivery, in terms of both its breadth and depth. Indeed, whilst STEM skills shortages in areas such as engineering are acute, shortages also exist for companies like Rolls-Royce in other areas, including business and management. The NSA is therefore ensuring that skills needs are addressed across a range of specialisms, with current provision in:

- Level 3 Craft Apprentices, including welding, machining, fitting and inspection
- Level 4 Nuclear Engineering Technician Apprentices
- Level 6 Nuclear Engineering Degree Apprentices
- Level 6 Nuclear Business Degree Apprentices

These are all long programmes, ranging from 3-4 years in length, providing appropriate breadth and depth with a long-term view to students' future careers. They combine base knowledge in Nuclear Engineering (such as Nuclear Safety and Nuclear Physics) with core modules in Manufacturing, Electrical, and Mechanical Engineering. This ensures that, upon graduating, graduates are broad engineers with the ability to flex, problem-solve, and respond to the evolving skills needs in the future of the nuclear industry, or indeed in other related industries.

Similarly, the Business Management scheme covers all the core support functions of business, including project management, procurement, planning and control, business management, finance and commercial, as well as sub-functions such as risk, export control, and estimating. This gives apprentices a breadth of experience that will allow them to appreciate how different functions interact and to flex to business requirements in the future across a broad industry spectrum.

At an operational level, the NSA is formally located and managed by University staff within the University's Apprenticeship Hub, with management reporting lines through to the Director of the Institute of Education & Skills and the Pro Vice-Chancellor of the College of Science & Engineering. Strategic oversight is exercised by a governance Board with representatives from all partners to the initiative.

The creation of the Nuclear Skills Academy is the cornerstone of a novel resourcing strategy that is providing new talent for Rolls-Royce Submarines Ltd's business opportunities alongside traditional recruitment, as well as delivering skills development, high-quality employment opportunities, and economic growth for the region. The NSA has been recognised across the nuclear sector and was awarded the Employer and Training Provider Partnership Award at the UK Nuclear Skills Awards 2023.

RECRUITMENT AND FORWARD PLANNING

Both the University and Rolls-Royce are anchor organisations within their city and region. It is for this reason that a critical element of the local business context relates to social mobility and inclusive recruitment practices. The University is skilled at attracting and retaining local talent, with almost one third of Derby's graduates coming from within the city or county and 69% of those graduates choosing to remain within the area after graduation. The local population of students have pride in their city and region, and this has translated into the Nuclear Skills Academy's recruitment, with over 1,200 applications received for its first cohort.

The Academy has instituted an attributes-based recruitment process for its apprentices that maintains academic quality but puts just as much emphasis on behaviours, attitudes, and aptitude rather than prior attainment of specific qualifications. As a result, Rolls-Royce has been able to recruit a significantly more diverse cohort than previously achieved, for instance by recruiting 18% women into the Academy in the first apprenticeship cohort: a 10% increase on the current engineering workforce demographic. Within the first

cohort of 200 apprentices who began their studies in September 2022, 60% were local to the city, with 30% coming from the wider region. Placed in the context of the fact that more than one third of households in the city fall within the most deprived in England when ranked according to the index of multiple deprivation, the fact that 90% of the Nuclear Skills Academy apprentices are local and have a full-time job and salary as they learn, has significant implications for social mobility in the city.

Building on this capacity to attract regional talent, the commitment to recruit 200 nuclear apprentices per year for at least the next 10 years is groundbreaking and is expected to be a key driver of not only regional development but also the projected annual expansion of between 2,500-6,000 additional nuclear recruits that the industry requires nationally.

For this reason, the long-term future of the Nuclear Skills Academy is being carefully managed across five phases, which reflect a commitment to inclusivity and sustainability. The NSA provides recruitment and training solutions not just for critical specialist roles, but for succession planning, cross-training from other industries into nuclear, and mid-career upskilling. The five-phased development plan will extend the Academy's provision into all points on the career path:

PHASE 1	200 new apprenticeships (with a commitment to 200 new apprentices annually)
PHASE 2	Mid-career re-training to allow recruitment and training of staff from other sectors/industries
PHASE 3	Transfer of in-company nuclear training to the Academy, with the University leading on tuition delivery
PHASE 4	Leveraging the NSA model to support partners
PHASE 5	Development of MSc and PhD offering, alongside leadership development

Further ambitions already exist in relation to the potential for growth into the broader UK nuclear supply chain to develop the skills needed to meet future demands, both civilian and military. Building upon the success of the Nuclear Skills Academy and recognising that this is likely to produce the highest concentration of NSQEP (Nuclear Suitably Qualified and Experienced Personnel) in the UK, there is a clear opportunity to develop unique, high-calibre skills solutions for a wide range of defence and civil nuclear supply chains.

THE CHALLENGE OF REGULATION

England's current apprenticeship system is subject to an array of administrative and regulatory bodies that extend across both Further and Higher Education provision. Universities offering Higher and Degree Apprenticeships not only have to approve and monitor the quality of programmes as part of their internal

degree validation process, but also have to deal with IfATE (now absorbed into Skills England), who are responsible for the design and quality assurance of apprenticeship standards at all levels, with industry sector bodies whose professional qualifications are often embedded into the apprenticeship, with the Department for Education who manage the digital system for distributing levy funding, with Ofsted, who conduct inspections of apprenticeship provision, and with the HR and training systems of each employer they engage with.

The heavy hand of regulation causes two principal problems which came to the fore when establishing the NSA. First, the complexity of the administrative and regulatory environment is frustrating to employers, especially to companies that are adept and agile in business practice and meeting market demands; they simply cannot understand the level and extent of regulation, which even when described as light touch, is limiting. Second, for the education partners within the NSA who were seasoned at navigating the regulatory maze, moving at pace is rarely possible and leveraging the capacity to do so is always a challenge.

Given these dual challenges, establishing the NSA in 8 months was a notable achievement. The scale of the project and its critical importance to both Rolls-Royce and the university meant that there was a high level of preparedness to invest the time and resources needed. Programme development, alignment to the apprenticeship standards and validation approval to meet quality requirements were all expedited without sacrificing quality thoroughness. All NSA partners had to accept the need to proceed at risk, which entailed being prepared to move on to the next step without waiting for the outcome of the previous one. The path was smoothed by the trust already forged between the two principal partners through their shared history of collaborative working and, consequently, their willingness to walk the regulatory and approval burden in each other's shoes. For example, the University of Derby was prepared to take on trust the evidence of skills demand that Rolls-Royce presented, without needing to conduct any independent validation of market demand, which would normally be required to establish the business case. In turn, Rolls-Royce accepted that quality education provision is based on a thoroughgoing programme design and validation process and that it was necessary for them as lead employer to proactively engage in the process of shaping the curriculum.

The third and final element assisting the navigation of the regulatory approval was the distinctiveness of the programmes under development. The decision to build the project around an apprenticeship offer was partly motivated by the need to appeal to the Rolls-Royce supply chain, which is largely composed of SMEs who have a basic familiarity with craft apprenticeships at sub-degree level and in many cases substantial prior experience of how the apprenticeship model works. Extending this to higher and degree apprenticeship standards specific to the nuclear industry meant that SMEs found it easier to see their skills needs directly reflected in the portfolio, thereby securing their engagement. The process was also greatly helped by the fact that, in contrast to other industry sectors, IfATE has successfully produced a relatively straightforward and compact set of standards in nuclear engineering, which perhaps reflects the fact that there are relatively few companies in the sector and a high degree of consensus over the key elements of technical training.

The regulatory burden around Higher and Degree apprenticeships needs to be significantly reduced. Given the experience and expertise within the HE sector in the design and validation of degree courses, there is no need to add a further burdensome layer to a process that works well. Skills England should adopt a light-touch approach, trusting institutions and their employer partners to take the lead and using AI to streamline the process of matching university degrees to the requirements of apprenticeship standards. Given the robust quality standards within universities, there is only a limited need for an additional inspection process, and the role of Ofsted should be restricted to remote monitoring of Higher and Degree apprenticeships quality data, only intervening with a direct inspection when there are signs that standards have fallen below an acceptable minimum threshold, or where specific concerns are raised over specific programmes by participants or stakeholders.

PROGRESS SO FAR

The NSA's first recruiting year 22/23 quickly established it as the largest provider of the Nuclear Scientist and Nuclear Engineer Degree Apprenticeship. This continues, and the apprenticeships now account for 40% of all starts in 2023/24 from eight providers (84 of the 211 starts nationally). The number of students starting the Nuclear Scientist and Nuclear Engineer (Integrated Degree) Higher Apprenticeship increased by over 60% in a single year (52 starts in 22/23 to 84 starts in 23/24).

Nationally for 2022/23, Engineering and Manufacturing apprenticeships have an achievement rate of 60.02% increasing to 63.70% on average in 2023/24. The NSA provision has an indicative (due to cohort completion in 2025) achievement rate of 92.1% making it 28.4% higher than the most recently published national achievement averages in the same subject area. Current NSA retention is 92.40% compared to a national average of 65.28% in 2022/23 and 64.78% in 2023/24, putting NSA 27.62% higher than the most recently published national retention averages.

In addition, in 2023/24 the University of Derby had the highest number of students starting the Engineering Manufacturing Technician Advanced Apprenticeship of all providers in England (39 starts) and is the 4th largest provider of the Pipe Welder Advanced Apprenticeship (of 17 providers with starts to this framework in 2024/25 so far).

The University recognises that outstanding student outcomes are a consequence of an outstanding student experience. Derby has invested in the pedagogic innovation of their educational delivery, delivering Educational Gain for all students. It levels the playing field, no matter what the background of the students. Recognition for the apprentices has been forthcoming, with two apprentices placed as finalists in the Derbyshire & Nottinghamshire Apprenticeship Awards 2024, nominated for Advanced Apprentice of the Year and Engineering Apprentice of the Year. In addition, due to the facilities at the NSA providing one of the largest welding workshops in the region, University of Derby apprentices won First and Second prize in the Skill Weld Regional Finals and then went on to be Silver Medallists in the National World Skills Competition.

The NSA is now in its third year of operation. So far, there has been no problem in hitting the annual target of 200 starts, or in maintaining the project's initial success in attracting a high proportion of local students and a good range in terms of diversity. This is a good start, and the University will continue to monitor progress in access, diversity, and inclusion as part of its ongoing evaluation of the positive impact of the initiative.

3.2 THE LOCAL PARTNERSHIP ECOSYSTEM

LOCAL SKILLS IMPROVEMENT PLANS

Collaborative partnerships around regional skills development have, over the years, moved steadily up the national policy agenda. In 2022 the previous Government introduced the policy of Local Skills Improvement Plans (LSIPs) as the main mechanism for achieving coherent, regionally focused strategies to identify skills priorities and drive better alignment between providers, local authorities, and employers, handing to Employer Representative Bodies (ERBs) – mainly, but not exclusively, regional Chambers of Commerce - the responsibility for creating them. In the words of the DfE guidance document, the intention was to "embed a stronger and more dynamic relationship between employers and providers within local skills systems"[14].

As far as the NSA initiative was concerned, however, the LSIP process proved largely irrelevant for two reasons. Firstly, in the absence of a Mayoral Combined Authority covering the Derby area, the regional LSIP had the difficult task of pulling together stakeholders across a wide geography that had little economic coherence and contained a patchwork of disparate local authorities. D2N2, as the area was called, comprised Derby, Derbyshire, Nottingham and Nottinghamshire, and included a huge range of employers and industry sectors, some based in sprawling rural areas, some in urban concentrations, with very different perspectives and priorities, as the LSIP reflects[15]. Despite the efforts of the ERB – in this case, the regional branch of the Federation of Small Businesses – who engaged with over a hundred different organisations, the June 2024 progress review had little tangible to report, other than more structured coordination between the region's seven FE colleges.

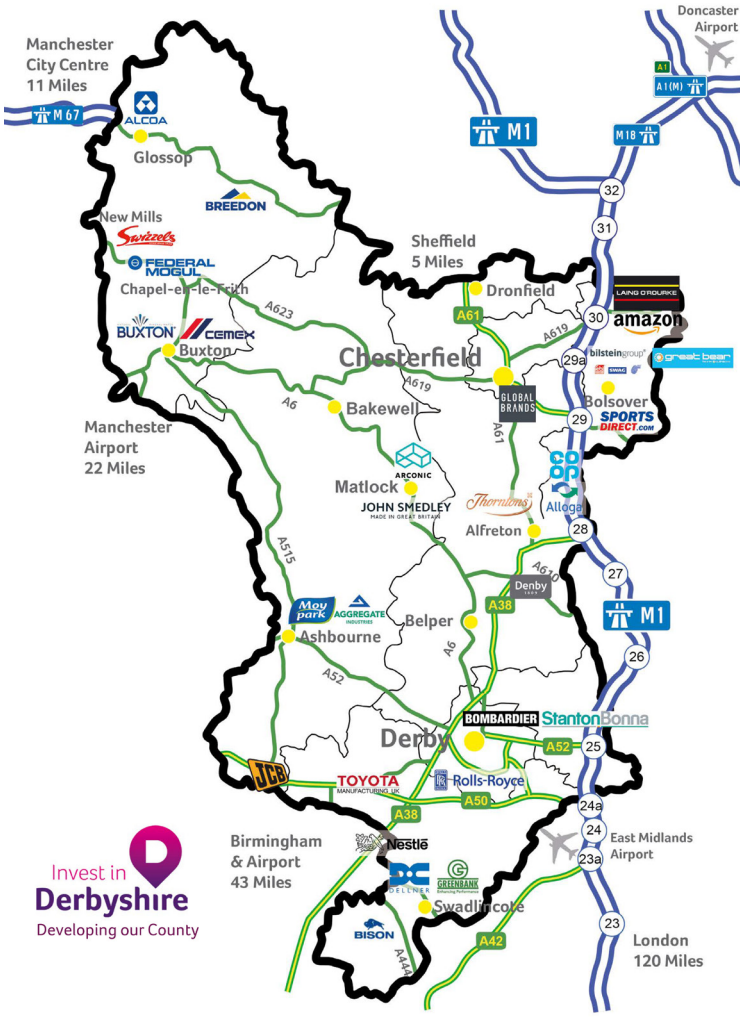
This is because the previous LSIP process explicitly excluded the higher education sector, which is the second key reason it was peripheral to the NSA development. A whole range of potentially valuable activities – knowledge exchange projects, vocational degrees, applied research, higher and degree apprenticeships – could not be woven directly into the LSIPs in any region, and the University of Derby was left as little more than a spectator in the process.

Since the NSA was launched, the Derby region has now become part of the East Midlands Combined County Authority (EMCCA), formed in March 2024, covering Nottinghamshire and Derbyshire. Moreover, with the imminent arrival of Skills England in 2025, the key functions of LSIPs are highly likely to be subsumed into regional spokes of the Skills England hub, and new guidance on LSIP development for 2026 includes

universities and other Higher Education Institutes. By setting devolved authorities as the default position for regional government, the December 2024 White Paper on English Devolution is almost certain to pave the way for the positioning of Mayoral Combined Authorities as the driving force behind future local skills coordination. This opens up the prospect that future developments and extensions of the NSA initiative will benefit from a stronger and more integrated partnership framework, with closer linkages between regional and national dimensions of sectoral skills strategies, and better integration between skills providers delivering at all levels.

THE DERBY PARTNERSHIP

Despite the limitations of the previous LSIP model, local partnership was at the heart of the NSA initiative, which was able to take advantage of a well-developed local skills partnership ecosystem. Delivering on regional skills through the nuclear industry demands a wide range of engagement with technical curriculum experts, specialist national industry and regulatory bodies, local recruitment intermediaries, local planners, politicians, and other community-based stakeholders.



Helpfully, the University was already actively involved in this agenda. Not only were Industry Advisory Boards already in train, but the University was a Consortium partner in the East Midlands Institute of Technology, work on which had been completed in the months previous to developing the NSA. The signature feature of Institutes of Technology is a three-way partnership between FE, HE, and employers, with employer engagement central not only in their running but in the programme design and recruitment. Derby could thus draw upon that experience as a guide and model for helping stakeholders navigate the various levels of engagement and clarify the ways in which they could best support the NSA development.

There are three types of partner organisations involved. Some, like Rolls-Royce and Innovate UK, have provided direct funding or time to support the NSA; others – like Derby Council, the Nuclear Advanced Manufacturing Research Centre, and the National College for Nuclear - have facilitated access to resources such as buildings and technical expertise. A third category of partner has provided political and PR support to the project, maintaining its positive public profile. The exemplary work of the University and Rolls-Royce Submarines Ltd in successfully coordinating this range of partners was recognised when it won the "Employer & Training Provider Partnership Award" at the 15th annual UK Nuclear Skills Awards held in Manchester in 2023.

The strength of the partnerships developed around the NSA is further reflected in the opening in December 2024 of the Midlands Regional Hub for Nuclear Skills as part of a new initiative, the National Nuclear Strategic Plan for Skills, launched in May that year. This will be the third regional hub so far established, following one in the North West sponsored by the Nuclear Decommissioning Authority, and one in the South West, sponsored by Babcock Ltd. It is already clear that the NSA is contributing to an emerging national network of centres and is therefore proving to be a national model for meeting the skills needs of the nuclear industry.

4. CONCLUSIONS AND RECOMMENDATIONS

The Derby Nuclear Skills Academy is undoubtedly a success and provides strong evidence of the effectiveness of apprenticeships, and particularly degree apprenticeships, in meeting recruitment challenges and skills shortages. Given the current debate over the future shape of the apprenticeship system, it is a timely reminder that with the right ingredients in place, the apprenticeship delivery model is one of the most effective solutions to delivering high-quality technical training. These ingredients include the structure of the nuclear industry, the organisational culture of the university provider, and the maturity of local partnerships.

APPRENTICESHIPS AND INDUSTRY SECTORS

Given their current structure and design, apprenticeships work best with industry sectors with the following characteristics:

- A high proportion of large employers
- Relatively stable market conditions, enabling organisations to plan their workforce needs over the long term
- Offering a high volume of full-time employment contracts
- Offering long-term employment prospects, with clear career development pathways
- A predominance of companies with well-developed HR and administrative infrastructure
- An established tradition of apprentice recruitment.

Fortunately, the nuclear industry exhibits all of these "apprenticeship compatible" characteristics and is therefore very well placed to take full advantage of a skills strategy based on apprenticeships. Because it has evolved as a national collaborative network linking companies, regulators, and government, the industry also offers fertile ground for replicating the NSA model, or variations of it adapted to local circumstances, across the UK. This is already underway, with the creation of the National College for Nuclear in 2016 acting as a catalyst for a network of providers, clustered mainly in Cumbria, Somerset and Suffolk, to invest in specialist facilities and expand specialist courses, with apprenticeships a key component of the offer. However, the majority of providers have so far been FE Colleges, and the main focus has been on nuclear power generation rather than nuclear defence technology. Although colleges deliver good quality higher education, the involvement of more universities, such as Derby, will enable the expansion of degree-level skills training to be accelerated, and at the same time assist in enabling the provision to embrace all aspects of the nuclear industry.

From a wider perspective, the apprenticeship-led model developed by Derby and Rolls-Royce could, in theory, be replicated relatively easily in sectors with similar characteristics to the nuclear industry. Of the eight sectors identified as priorities in the Modern Industrial Strategy, three of them – Advanced Manufacturing, Defence, and Life Sciences – share most of the characteristics outlined above and are already benefiting from the growth of apprenticeship provision at higher levels, although work needs to be done to harness them into a national network similar to the one emerging in the nuclear sector and thus maximise their overall impact. But in at least three other priority sectors – Clean Energy Industries, Creative Industries, and Digital Technologies – only a small minority of employers exhibit apprenticeship-compatible characteristics, and there is a critical question around the suitability of the apprenticeship model to meet their skills needs.

The apprenticeship system is poorly adapted to industrial sectors where few workers begin their careers on full-time permanent employment contracts. The majority of businesses in these sectors find it prohibitively difficult to support trainees through lengthy apprenticeship programmes and struggle to adapt to the off-the-job training requirement embedded in the delivery model. This is reflected in the relatively low take-up of apprenticeships in these sectors.

All the evidence is that in the modern economies of the developed world, there is a steady decline in the number of firms with apprenticeship-compatible characteristics. More and more companies, including those operating in many of the Government's key growth sectors, are SMEs and micro-businesses, tending to employ staff on part-time and short-term contracts, and in many cases no longer offering standard employment contracts at all. Unless the apprenticeship system, alongside other vocational and technical training schemes, adapts to this new reality, there is a risk that it will become less and less relevant to the needs of growth industries.

INDUSTRIAL STRATEGY PRIORITY SECTORS – APPRENTICESHIP COMPATIBILITY

Using six "compatibility" factors, this table rates the potential for apprenticeships to play a strong role in the eight priority sectors from the Modern Industrial Strategy.

APPRENTICESHIP COMPATIBILITY RATING		
SECTOR	APPRENTICESHIP COMPATIBILITY	COMMENTS
Advanced Manufacturing	High	Strong in 2 of the 6 Frontier areas, aerospace & automotive.
Clean Energy Industries	Low	Market still forming, many new firms, skills & careers unclear.
Creative Industries	Low	Much temporary/freelance work unsuited to apprenticeships.
Defence	High	Armed Services amongst largest apprenticeship employers.
Digital and Technologies	Medium	High level of skills disruption due to technological change
Financial Services	Medium	Strong in accountancy, less so in e.g. insurance and investment.
Life Sciences	High	Rapidly growing use of degree apprentices.
Professional and Business Services	Medium	A patchwork of specialisms, most requiring L4-6 apprenticeships.

High: 5-6 characteristics
Medium: 3-4 characteristics
Low: 0-2 characteristics

THE LIMITS OF THE APPRENTICESHIP SYSTEM

The apprenticeship system has become increasingly out of step with other approaches to the design of adult skills programmes, which emphasise the importance of flexible, "bite-sized" short courses which enable busy working adults to accumulate credits towards an overall qualification in stages at their own pace over time. Modular course design, which enables credit accumulation, is at the heart of the Lifelong Learning Entitlement, due to be rolled out in 2026/27, with individuals able to take a series of 30 credit modules – equivalent to 12-13 weeks of learning – funded through the student loan system. But even though LLE courses will be a third of the length of full time courses, a variety of employers have already commented on the practical difficulties of supporting their employees to take on such sizeable chunks of learning and have argued that the kind of targeted in-work upskilling that they urgently need to offer their staff requires short, intensive courses rather than longer, broader training programmes. Learning how to use, for example, new digital systems or new green technology processes is often best done through hours or weeks of training, not through months or years of study.

Year-long or multi-annual programmes such as apprenticeships are not an effective solution to many of the training challenges faced by businesses of all types. This misalignment between the design of post-2017 apprenticeships and the training needs of a range of industries may well be a contributing factor behind the fall in apprenticeship starts in many industry sectors. Once again, the Government's planned reform of the Levy will be an opportunity to address this problem, but it is quite unclear how apprenticeships can be divided up into short course "apprenticeship units" without losing many of their core quality features.

The defunding of the majority of Level 7 apprenticeships is not an immediate problem for the NSA project, although it may well require a rethink of Phase 5 of the delivery plan, which envisaged master's and PhD programmes coming on stream. Most, if not all, of the potential applicants for any future Level 7 provision may well be within the newly established age limitation of under 22 years old. However, any further move to restrict higher and degree apprenticeship funding or eligibility will pose an immediate risk to the NSA initiative and as budget pressures caused by the growth of higher and degree apprenticeships are likely to be an ongoing issue, the Government needs to carefully consider ways of protecting it, and other IS-8 key priority sectors, from any form of rationing of apprenticeship funding.

INDUSTRIAL STRATEGY AND PARTNERSHIP

In relation to the issues around Industrial Strategy and partnership, the Government's new policies are promising, but only as more details emerge of their implementation will an assessment of their likely impact be possible. In relation to Derby, the most important policy reform will be to bring universities fully into local

and regional skills partnerships linked to the IS-8 priorities. This is very likely to happen soon; there are strong indications that the "major package of reforms" promised for the Higher Education sector by the Education Secretary in November 2025 will include measures to greatly enhance the place-making role of universities. In a recent speech, Skills Minister Jacqui Smith mused aloud, "higher education is an integral part of the skills landscape at a more local level….What more then can we do to encourage this role and to ensure that partnership and collaboration with each other, with further education, with local government, with employers and with communities can flourish…?"[16]. The implementation of the policy reforms set out in the Post-16 White Paper, published in October 2025, will be of critical importance to all universities committed to a place-based development strategy, and to the University of Derby's aspirations to widen and deepen its role as an anchor institution within the regional skills ecosystem.

FUELLING THE CORE

The creation of a partnership initiative between a key industry sector and a major university is an important case study of how the nation's skill challenge can be addressed in practice. It has begun its journey at a time when once again education and skills policy landscape is in flux, so the NSA's future success will, to a great extent, depend on how exactly the new landscape of accelerated devolution, a more flexible Growth and Skills Levy, greater coordination through Skills England, and an enhanced Industrial Strategy will affect its evolution.

The model is already proving to be a powerful and effective one, because it is so well tailored to the needs of the UK's growing nuclear industry. But it is precisely this close fit between training need and training design that is helping it work so well, and although the Nuclear Skills Academy could be replicated in other sectors, the key lesson it highlights is the need for bespoke solutions to be developed to meet the diversity of employment and skills requirements in different industries and geographies. This requires a wider toolkit of training methods to be deployed – including short, modular, online and blended courses – and a regulatory regime which encourages flexibility and adaptability and is a lot simpler to navigate.

Skills could be described as the active core of a modern economy, energising growth, productivity, and prosperity. To fuel that core, we need forward-thinking employers like Rolls-Royce, excellent training providers like the University of Derby, and a policy environment that encourages them to achieve critical mass.

RECOMMENDATIONS FOR GOVERNMENT:

1. Continue to support Higher and Degree Apprenticeships as a key component of England's apprenticeship system.
2. Prioritise apprenticeship funding to address recruitment and skills shortages and consider alternative ways to incentivise employers to invest more in workforce development and in-house training to raise productivity.

3. To widen access for young people and alleviate pressure on the apprenticeship budget, progressively take apprenticeship funding for 16–19-year-olds out of the apprenticeship levy system, starting by directly funding all intermediate (Level 2) young apprentices.
4. Mandate Skills England to simplify the administrative and regulatory framework around higher and degree apprenticeships, through streamlining the apprenticeship design and approval process and reducing Ofsted's role in inspecting apprenticeship provision.
5. Develop mechanisms to match the classification of apprenticeship subject areas to priority industry sectors to enable effective evaluation of the scope, relevance and impact of apprenticeships in each sector.
6. Through the Growth and Skills Levy, develop a toolkit of shorter, more flexible workforce training strategies, including shorter courses, modular programmes, and online delivery.
7. Move away from LSIPs by supporting Skills England, in partnership with Mayoral Combined Authorities, to develop Regional Education Partnerships that include universities.
8. As part of the Higher Education reform, introduce tangible financial incentives for universities to engage actively in local and regional skills partnerships.

RECOMMENDATIONS FOR THE UNIVERSITY OF DERBY:

1. Continue to play an active role in local skills partnerships and play a leading role in the development of the future regional skills partnerships envisaged by Skills England.
2. Raise the profile of the Nuclear Skills Academy as an exemplar of how Higher and Degree Apprenticeship funding can be used to support the Modern Industrial Strategy while at the same time promoting access, equality, and inclusion.

ENDNOTES

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ABOUT THE LIFELONG EDUCATION INSTITUTE

Britain faces deep social fractures, entrenched inequalities and a decade of stagnating productivity, while far too many adults find the pathways to reskilling and personal development blocked. To reverse this trend, advanced education beyond the school years must be central to our national strategy. The Lifelong Education Institute proposes a bold, learner-centred model that seamlessly integrates formal and informal learning, academic and vocational routes, with comprehensive wrap-around support—equipping individuals with the skills, knowledge and resilience required to flourish in an era of rapid technological and economic change.

Our approach is built on four interdependent pillars: placing the lifelong learner at the heart of policy design; architecting a truly integrated tertiary education system; forging robust partnerships between government, industry and education providers; and harnessing best practice from across the UK and internationally. By championing universally accessible, flexible and high-quality learning opportunities for school leavers, mid-career professionals, parents returning to work, retirees and everyone in between, we can open new pathways out of disadvantage, ignite innovation and secure a more inclusive, prosperous society. Lifelong education is not a privilege—it is a right we must legislate and protect if the UK is to thrive in the twenty-first century.

Lifelong Education Institute

Fuelling the Core:
Apprenticeships, Industrial Strategy, and The Derby Nuclear Skills Academy

This report examines the Derby Nuclear Skills Academy (NSA), a landmark partnership between Rolls-Royce and the University of Derby. Established in 2022 to secure the talent pipeline for Britain's nuclear submarine fleet, the NSA has become a vital model within the UK's 2026 industrial landscape. As the Government implements a new Industrial Strategy and transitions to a Growth and Skills Levy, this report evaluates how such place-based initiatives can address national skills shortages.

Boasting a 92.1% achievement rate, the Academy proves that high-level technical training can also drive social mobility; 90% of its apprentices are local, and female recruitment has risen to 18%. However, the report warns that policy shifts, including the 2026 defunding of Level 7 apprenticeships, pose risks to this successful model. It offers strategic recommendations for the Government and Skills England to protect degree apprenticeships and simplify regulation. Ultimately, "Fuelling the Core" argues that bespoke, industry-led partnerships are essential to energising the UK's productivity and securing its strategic future.

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