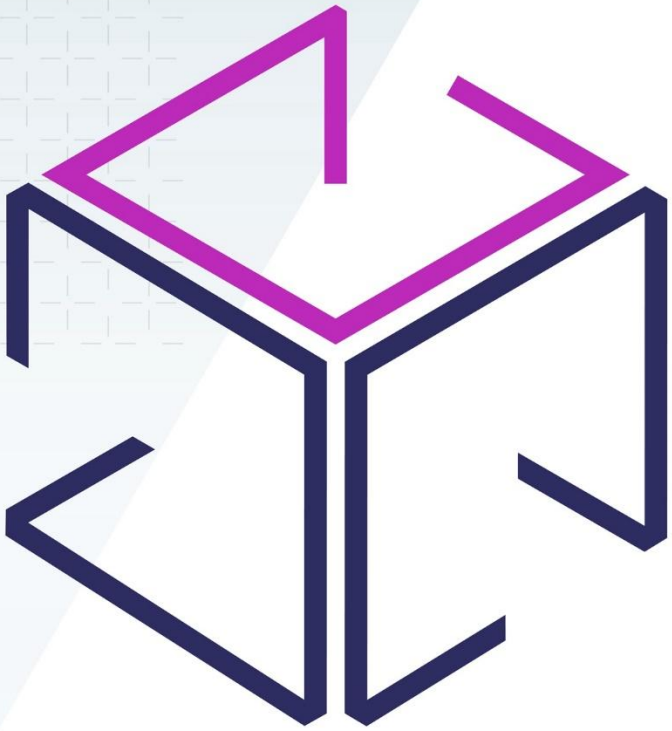
Workforce Foresighting Hub



Design, Manufacture and Construction of Nuclear Small Modular Reactors (SMR) to Deliver 24GWe of Nuclear Power by 2050 for the UK.

Workforce Foresighting Hub Findings Report in Collaboration with NucCol and MTC.

mtc where progress happens

nuccol

July 2025

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Acknowledgements

The Workforce Foresighting process integrates data from the following international data sets:

Skills England IfATE – Institute for Apprenticeships and Technical Education, England

ESCO – European Skills, Competencies, Qualifications & Occupations, EU

ONet – Occupational Networks Online, USA

In accordance with licence and publishing requirements of these organisations for the use of their data sets, the Workforce Foresighting Hub team states that –

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The method and process used in the Workforce Foresighting process is under development and there may be errors and omissions in the data provided.

*This report was produced following workshops undertaken **February – June 2025** using the data set and tools available at that time.*

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Executive Summary

Executive Summary

This report outlines findings from the Workforce Foresighting cycle focussing on Small Modular Reactors (SMRs): manufacture, construction and digital optimisation by 2050. The study is sponsored by Rolls Royce SMR and conducted by NucCol and MTC in collaboration with the Workforce Foresighting Hub (WFH), an Innovate UK (IUK) initiative.

Workforce foresighting is a systemic approach to planning ahead and anticipating future skills and capability needs associated with new technologies and government transformation targets. It involves identifying and understanding the skills required for tomorrow's jobs, ensuring our education and training systems are prepared so that our workforce is ready to adopt new technologies and support future industrial growth. This report sets out the findings of the workforce foresighting study and suggests the next recommended actions required by various stakeholders to ensure a workforce is created that is prepared to effectively implement these new technologies in the sector.

Workforce Foresighting Challenge

The UK government has set an ambition of 24GWe (Giga Watt Electrical Power) of nuclear capacity for the UK by 2050 as part of its Civil Nuclear Roadmap. (Department for Energy Security & Net Zero, 2024). The UK is also committed, with its international partners, to the tripling of nuclear power worldwide by 2050. The challenge will be met in part through a new build programme involving Small Modular Reactors (SMRs), large conventional nuclear power plant (GWe reactors) and Advanced Modular Reactors / Fusion plant; and will link with new plans to expand Nuclear Defence Security. It will also be underpinned by new developments in decommissioning and regulation.

Participants and Stakeholders

As with all cycles of the Workforce Foresighting programme, it is vitally important to get the correct stakeholders involved from the outset. The SMR cycle is no different and we ensured that we reached out to all the companies that would be involved in future SMR projects. Below is a list of participants for this cycle which includes Technology Domain Specialists, Employers and Educators.

Industry Participants	Skills Participants	Technology Participants
RR-SMR	University of Sheffield (AMRC-TC)	RR-SMR
Assystem	UKAEA	UKAEA
Laing O'Rourke	NSAN	Assystem
Cavendish Nuclear	Loughborough University	GE Hitachi
MTC	GBE-Nuclear (NSDG)	NSAN
	MTC	MTC
	EAL	

Interested Parties

Industry Participants	Skills Participants	Technology Participants
Sheffield Forgemasters	Lakes College	BAE Systems
Jacobs	CITB	Holtec
Atkins Realis	ECITB	Westinghouse
	University of Derby	Sheffield Forgemasters

Thanks to all those organisations for their time and commitment to providing insights and data for this study, in the hope that this process will have a significant impact on the sector; where this data set can be updated periodically rather than starting from the beginning with reviewing what exists and what the gaps are manually.

The Findings and Insights

- As part of this study, **145 Future Capabilities** were identified, leading to **22 Future Occupational Profiles (FOPs)** with **4 roles levels**, across **6 supply chain partners.** Surprisingly, gaps were evident in all the Skills England IfATE Apprenticeships currently available (within the limitation of our search) to satisfy the needs of these FOPs. Showing that whilst current apprenticeships may satisfy part of the requirements of the future industry needs, **the gaps need bridging**, and it is across all FOPs

- There is **commonality of Future Occupational Profiles (FOPs)** across all the supply chain partners **except the Regulators**.

- There is a skew towards **high-level education (level 7)** with a focus on Design and Implementation with a requirement for all (industry wide) to be educated on **Nuclear Health, Safety, and the Environment.**

- With the development and deployment of SMR's as a new industry, the other **modulation industries** could use this model and partner in this area across functional areas: digitisation, manufacture, and construction

- Besides the new technical requirements for SMR's we are seeing an **increased emphasis on construction skills** with site preparation and delivery of modules to site.

Next Steps

- Validation and priority selection aligned to government direction with Nuclear Skills Development Group (NSDG)

- Further discussion and validation, on the following which were considered to be priority Future Occupational Profiles (FOPs)
    - Cyber Operational Defence Specialist
    - Nuclear Manufacturing Engineer
    - Automation Maintenance Technician
    - Industrial and Production Engineer
    - Project Engineer
    - Robotics Engineer

- Prioritise most important courses to be developed and rank in order. Understand which can use existing courses with additions/ modification, or to add additional short courses. Develop strategy, short-medium-long term approaches.

- Forecasting future workforce demand and areas of focus across the supply chain. Consult with the Nuclear Skills Plan which includes a Nuclear Workforce Assessment, (Nuclear-Workforce-Assessment-2024.pdf.) This looks at the sector and maps out the expected demand.

- To better understand underlying factors: students, domicile, HR and recruitment, adjacent sectors and attracting people to work in the Nuclear Sector, this can be better understood once it is known where the SMR sites will be located.

- Funding routes and policy for curriculum development and pilot programs.

- As part of causing action, it is intended to work with the following stakeholders: Safety Directors Forum, Destination Nuclear, National Nuclear Strategic Plan for Skills, NSDG and GBE-Nuclear, IUK and Skills England.

1. Introduction

1. Introduction

1.1 Background to Workforce Foresighting

The report “Manufacturing the Future Workforce” (Collier et al., 2020) recommended the Skills Value Chain as an approach to avoid shortfalls in workforce capabilities relating to future innovations (see Figure 1). This is the genesis of the workforce foresighting programme, which is sponsored by Innovate UK and delivered through the Innovate UK Catapult Network.

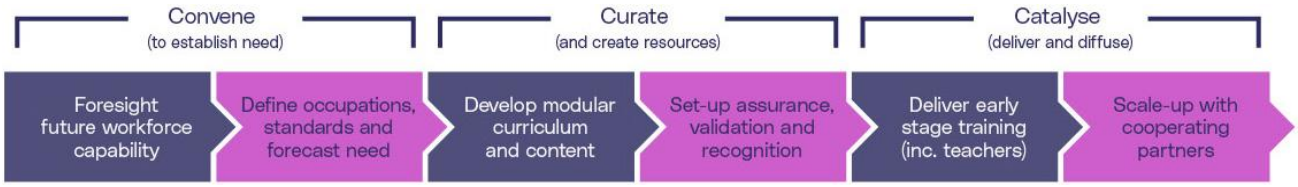


Figure 1: The Skills Value Chain

The first step of the skills value chain is to “Foresight future workforce capability”: This calls for technology, industry, education, and training partners to convene using government as a focal point, to “foresight and articulate future skills needs, standards and qualifications associated with emerging technologies” (Collier et al., 2020).

1.2 Workforce Foresighting - Process Overview

The core of workforce foresighting is convening three groups of relevant specialists to conduct structured, Delphi-style, facilitated workshops to capture and discuss the set of organisational capabilities that will be required to respond to and exploit technology innovation.

Organisational capabilities are captured using a bespoke classification that has been developed by the Workforce Foresighting Hub. The classification uses a structured common language to enable cross sector and cross centre collaboration and integration of data. Additionally, the classification enables data from a number of other national and international open-source workforce datasets to be integrated through the same common language. The data is held in a cloud based “data-cube” that is dynamically growing as each workforce foresighting cycle adds to the shared data relating to future workforce capabilities.

Using cutting edge AI and Large Language Model data tools, the data-cube is used to undertake detailed analysis to ‘map’ future workforce capability requirements against the current education and training provision to identify where existing provision can be used and where new provision, CPD or qualifications are required.

As an agile development project, the Workforce Foresighting Hub team are constantly evolving and improving the detailed workshop process and workshop approach, but always consists of the following stages:

Considering – Clarifying the Challenge to be met (the 'what' and the 'when') and collating solutions (the 'how') as foresighting topic suggestions align with strategic priorities

Identifying – Gain clarity and consensus about the solutions to be put forward – make the case for foresighting

Preparing – The convening of specialists and scheduling of workshops

Carrying out – Run foresighting workshops with experts, collate and analyse data

Communicating – Insights, findings and recommendations gathered from all research in report

Causing action – The driving of action based on the recommendations (promoting progress down the rest of the skills value chain) built on the findings and recommendations of foresighting

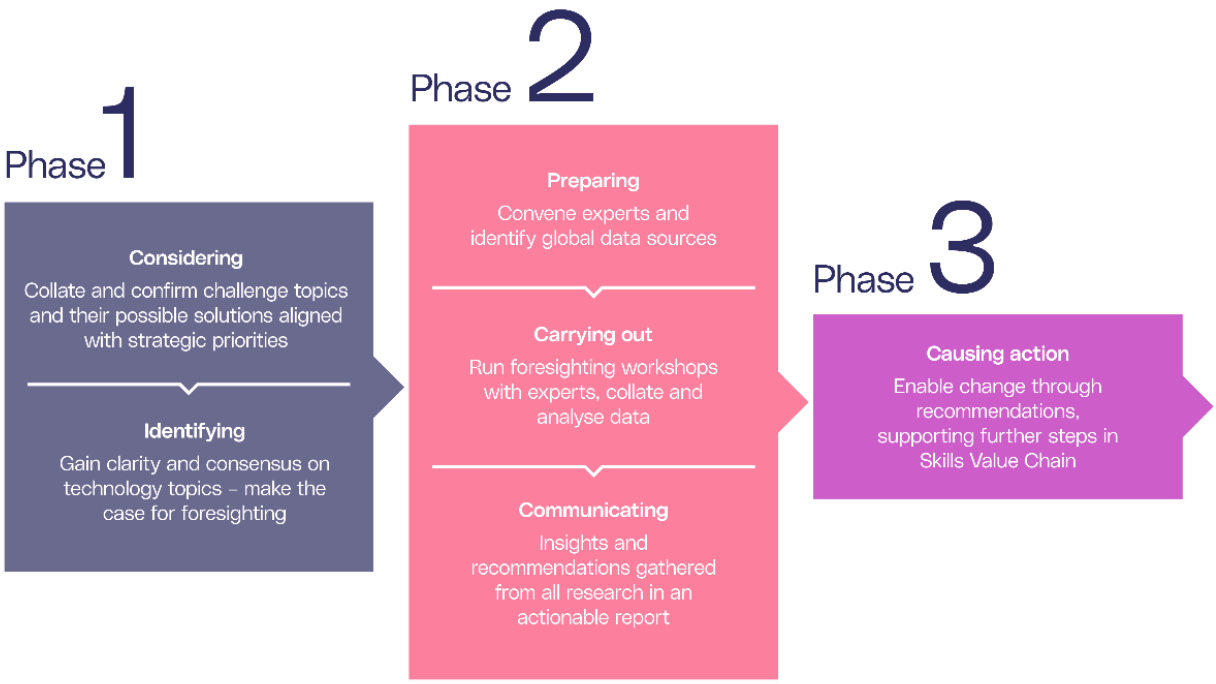


Figure 3 - The workforce foresighting process

1.3 Foresighting vs Forecasting

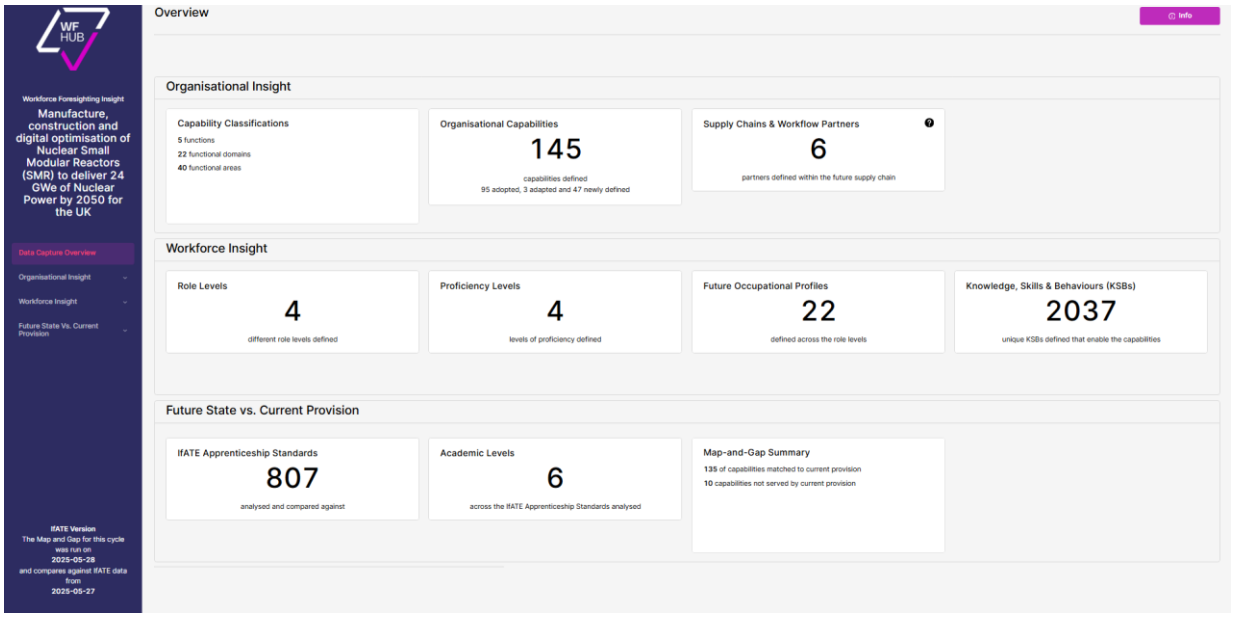
Although this study is focussed on workforce foresighting (capabilities required) it is important to keep in mind parallel findings from forecasting (required capacities and numbers). Forecasting, alongside foresighting, provides vital input to the sector, feeding into recruitment and development targets for employers, and consideration of economic class sizes and recruitment targets for educators. However, it is beyond the scope of the foresighting study to carry out independent forecasting, and as such readers should refer to referenced studies for detail on forecasting.

1.4 Introducing the Visualisation Tool

The Workforce Foresighting Hub's Visualisation Tool is a powerful, innovative system, which will enable the reader to explore and analyse foresighting data to determine the capabilities required for future roles. Links throughout this report make it easy to identify existing standards which meet the needs of these future roles and pinpoint where new standards are necessary to develop a skilled workforce equipped to adopt new technologies.

The data is generated by the foresighting cycles, integrating the expertise of technologists/domain specialists, employers, and educators. The data informs the development of future curriculums and course content as determined by the action plan. Using AI tools validated by human oversight, and by linking to external data sources, the tool identifies differences at the level of occupation/role as well as detailed changes required to help update/refresh knowledge, skills and behaviours thus delivering insights for learners, providers, creators, and assurers of skills.

Detailed instructions on how to use the Visualisation Tool can be found in the appendix.



2. Aligning the Challenge and Solutions with National Priorities

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2.1 Positioning and Context of National Challenge

To scale up UK Nuclear Energy by a factor of x 4. In the Ten Point Plan for a Green Industrial Revolution (HM Government, 2020) and the Energy White Paper 2020, (HM Government, 2020) the government confirmed its commitment to nuclear power and the development of advanced nuclear technologies in Britain. Further in the British Energy Security Strategy (2019 - 2022 Johnson Conservative Government, 2022) and Powering up Britain Energy Security Plan commitments to an overall ambition of delivering up to 24GWe of nuclear power capacity by 2050 have been made to achieve energy security and net zero goals while delivering value for money for taxpayers.

It is estimated that up to **40,000 new jobs will be created by 2030** in the nuclear sector to achieve these targets. The industry currently employs 83,000 and will increase anywhere between 123,000 and 130,000 in this time period. Most of these jobs will be highly skilled, highly paid roles, increasing the skills base within the UK and making the country more competitive around the world. As the **UK** becomes possibly the **first country in the world to bring small modular nuclear reactors** "SMRs" on-line, there is a great opportunity to export the technology, knowledge and skills to other countries who are further behind the curve in implementing these new reactors.

SMRs will be factory built, from smaller units called **modules**, which are transported to site. This reduces the time and cost of building and negates project delays, to ensure delivery and operation on time. These methods are different to those of the GW reactors which have been designed and built the same since the 1950's. New technologies and ways of working will require suitably qualified and experienced personnel (SQEP). This represents a shift change in working practices for the industry, which will include additional knowledge, skills and behaviours and so new qualifications and/or short courses will be required to take into account these changes.

Likewise new technologies, materials and innovation are also required for development of the Advanced Modular Reactors, Fusion Power Plant such as UKAEA's STEP; not forgetting the decommissioning, recycling, and storage of nuclear waste. Hence, the need to review the skills needed for the sector's future workforce; to ensure that the curriculum for educational and training programmes is up to date and can provide the numbers of skilled people at the right time and place.

Skills Insights - Nuclear Skills Delivery Group as detailed in the 'National Nuclear Strategic Plan for Skills' (NSDG, 2024) there are a number of job roles that are facing critical shortages in the UK, for example: Project Managers, Welders, Project Control Engineers, Safety Case Authors, Radiation Protection Advisors etc. Taking into account that other emerging sectors are also after people with some of these skills, such as Hydrogen Production, CCUS, Data Centres, Space Exploration etc..), then there is a need to find innovative ways of increasing

the numbers of people coming into the sector without detracting from the quality of the training provision, to tackle the numbers of required SQEP (Suitably Qualified and Experienced Person(s)) (40,000 by 2030). Yet the breakdown of skills and skills levels is not clear for these numbers.

Whilst relevant existing courses and qualifications exist, it is necessary to look in more detail at future job roles and to better understand if they will continue to meet the need as the new SMR's are designed, tested, and built. Or whether changes to the curriculum or even new apprenticeship(s) are required or additional training courses, to include important areas such as the safety case, equipment qualification and testing, codes and standards, advanced design methods such as design optimisation, and specialist automation techniques for welding, to name a few. It is suggested that this area would form part of the activity / consultation with industry to gauge and to better understand the current and future gaps.

Opportunities exist for staff to transfer from declining sectors such as Oil & Gas, to nuclear, where they have the core skills and qualifications, to then receive a 'top-up' course(s) to bridge the gap. Hence the need to study in more detail the future workforce requirements for the sector and how these might best be satisfied.

New qualifications, production methods and working practices will be needed to take the nuclear industry from a site-based scenario to a factory, production line system of working. The quality requirements for a nuclear production line far exceeds the current requirements in existing production line facilities such as car plants. Whilst some existing qualifications may be able to be tweaked to take into account the increase in quality, additional, higher-level courses may have to be developed.

Other supporting references are provided below:

- Civil Nuclear Roadmap toward 2050 (Department for Energy Security & Net Zero, 2024) targets 24GWe by 2050
- Energy White Paper Powering our Net Zero Future (HM Government, 2020) notes the importance of nuclear power as part of the energy mix and suggests that demand for electrical power generation could be double by 2050
- National Nuclear Strategy Plan for Skills. Building skills for the nation's nuclear capability (NSDG, 2024) Current sector plans set Skills Targets to fill 40,000 new jobs by 2030
- Ministry of Defence (Defence Nuclear Organisation, 2025)
- Advanced Nuclear Technologies - GOV.UK
- Industrial Strategy: Clean Energy Industries Sector Plan

2.2 Potential and prioritised technology solutions to the challenge

When entering this cycle, there were three possible options for a technological solution. These are laid out below with the table identifying which lead technology companies would be involved in the cycle. We gave each technology a rating and although all three options are important for achieving net zero it was agreed that as the SMR programme was in its initial stages, this cycle stood a better chance of getting ahead of the curve in terms of identifying future skill requirements.

	Solution Technology	Possible Sponsor Organisation
Option 1	Small Modular Reactors: Design, Construction & Digital Optimisation	UK SMR/Westinghouse/GE Hitachi/X-Energy/Holtec/UKAEA/BAE Systems/MoD
Option 2	Conventional Reactors: Giga Watt Reactors & Decommissioning	EDF Energy/Westinghouse/GE Hitachi
Option 3	Advanced Reactors including Fusion (using new materials)	UKAEA/Holtec

From the above table, we have presented below the case for each technology solution and how each are relevant to the challenge of meeting net zero by 2050.

1. Small Modular Reactors: Design, Construction & Digital Optimisation

On Tuesday 10th June, the Energy Secretary the Rt Hon Ed Miliband MP announced that Rolls-Royce SMR were selected as the preferred bidder to build the country's first Small Modular Reactors. It is envisaged that a state-of-the-art factory will be built to manufacture the components in a factory setting, rather than on site as the megawatt plants are built. A production line set up may be the preferred option, something which the nuclear sector has not done with previous builds. Working with Rolls-Royce SMR, Great British Energy - Nuclear (GBE-N) will aim to allocate a site later in 2025 and connect projects to the grid in the mid-2030s.

By having these manufacturing facilities set up, it will enable the components of the SMRs to be manufactured 24 hours a day (shift patterns), as they will not be susceptible to the challenges of weather and location as so often belies the megawatt sites such as HPC and SZC.
SMRs are new technology and new working practices will need to be put in place due to the quality requirements associated with nuclear reactors. This report reviews the skills needs, through defining the Future Occupational Profiles (FOPs) and then understanding the skills gaps to be filled. The methodology follows a series of workshops with industrial and academic partners to extract new insights for the future needs. Where the foresighting is supported with a rigorous process where Artificial Intelligence and current data is mapped against the identified future needs to provide the gap analysis to current provision.

Due to the size of future workforce requirements for the whole nuclear sector, we recommend that future Workforce Foresighting cycles will be required for **Giga Watt Nuclear Power Plant & Decommissioning**, followed by **Advanced Reactors including Fusion** as follows:

2. Conventional Reactors: Giga Watt Reactors & Decommissioning

The UK is currently building a new Nuclear Power Station at Hinkley Point B in Somerset (HPC), and plans are well advanced for a second station based at Sizewell in Suffolk (SZC). Both stations will include two European Pressurised Reactors (EPR) designed by EDF, with SZC being a 'mirror image' of HPC. A lot of learning has taken place on HPC where lessons learned will be incorporated into SZC when this station gets final approval later this year (2025). Shortages of key workers and skills were identified at HPC including welders, Project Managers, Project Control Engineers, Radiological Protection Advisors etc. We are mindful that future Giga-Watt reactors that are being planned may have different technologies as they have been designed by companies other than EDF. So, a look at these new technologies and the future skills requirements would be needed before they get approval by government. Alongside nuclear new build, we have decommissioning of the existing nuclear fleet and the storage of used fuel.

The UK is currently looking for a 'Geological Disposal Facility' (GDF) to be sited somewhere in the UK (not Scotland) and discussions are underway with interested councils. This is a 100-year project and so the skills challenges are unknown at this time as the UK have not built a GDF to date. Furthermore, Sellafield are looking to have some 30,000 $1m^3$ stainless steel boxes manufactured to store the used nuclear fuel. Design and manufacture of these boxes has proved to be challenging, and a final design is still to be made.

3. Advanced Reactors including Fusion (using new materials)

Advanced Nuclear Technologies encompass a wide range of nuclear reactor technologies under development. Generation IV and beyond AMRs, which use novel cooling systems or fuels to offer new functionality (such as Industrial Process Heat) and potentially a step change reduction in costs. Development of AMRs are not as advanced as SMRs, so we have the opportunity to get in early with these new designs to help shape the skills and qualifications needed ready for when they come online.

While all the Nuclear Fusion plants are being designed, built, and brought online, Nuclear Fusion is in the background, with prototype experimental fusion reactors being designed and built in France (ITER). The UK is also building a first of a kind fusion reactor at West Burton in Nottinghamshire. Due to the high temperatures involved with nuclear fusion (15 million degrees Celsius), new materials have yet to be developed that can cope with these extremes in temperature. The welding of these 'exotic' materials are also proving to be problematic and again, we have the opportunity to be proactive with the skills and qualification needs of this new technology.

The table below shows the number of people estimated to be required for each technology solution.

	DESIGN UK based organisations will undertake activities that contribute to the design/creation of the solution technology.	MANUFACTURE UK based organisations will undertake activities that contribute to the manufacture/production of the solution technology.	INSTALL/COMMISION UK based organisations will undertake activities to install/commission the solution technology.	OPERATE/MAINTAIN UK based organisations will operate/maintain the solution technology.
Small Modular Reactors: Design, Construction & Digital Optimisation	**100s to 1000s**	**1000s to 10,000s**	**100s to 1000s**	**10s to 100s**
Conventional Reactors: Giga Watt Reactors & Decommissioning	100s to 1000s	1000s to 10,000s	1000s to 10,000s	1000s to 10,000s
Advanced Reactors including Fusion (using new materials)	100s to 1000s	1000s to 10,000s	100s to 1000s	10s to 100s

The table below shows the estimated timings for each technology solution, although these may change due to government and/or industry requirements.

	DESIGN UK based organisations will undertake activities that contribute to the design/creation of the solution technology.	MANUFACTURE UK based organisations will undertake activities that contribute to the manufacture/production of the solution technology.	INSTALL/COMMISION UK based organisations will undertake activities to install/commission the solution technology.	OPERATE/ MAINTAIN UK based organisations will operate/maintain the solution technology.
Small Modular Reactors: Design, Construction & Digital Optimisation	**2026**	**2027**	**2030**	**2050**
Conventional Reactors: Giga Watt Reactors & Decommissioning	2024	2025	2035	N/A
Advanced Reactors including Fusion (using new materials)	2027	2030	2040	2050

2.3 Workforce Foresighting for Chosen Prioritised Technology Solutions

Small Modular Reactors (SMRs) are advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors. SMRs, which can produce a large amount of low-carbon electricity, are:

- **Small** – physically a fraction of the size of a conventional nuclear power reactor.
- **Modular** – making it possible for systems and components to be factory-assembled and transported as a unit to a location for installation.
- **Reactors** – harnessing nuclear fission to generate heat to produce energy.

SMRs offer savings in cost and construction time, and they can be deployed incrementally to match increasing energy demand. In comparison to existing reactors, proposed SMR designs are generally simpler, and the safety concept for SMRs often relies more on passive systems and inherent safety characteristics of the reactor, such as low power and operating pressure. SMRs have reduced fuel requirements. Power plants based on SMRs may require less frequent refuelling, every 3 to 7 years, in comparison to between 1 and 2 years for conventional plants. Some SMRs are designed to operate for up to 30 years without refuelling.

Manufacture, construction and digital optimisation of Nuclear Small Modular Reactors (SMRs) to deliver 24 GWe of Nuclear Power by 2050 for the UK

2.4 Current and Predicted Scale of Technology Deployment in UK

Small Modular Reactors (SMRs) are being developed and deployed globally, with numerous designs in various stages of development across 19 countries. Due to their modular and factory-built nature, SMR's are expected to have a significant impact on the nuclear supply chain by creating new opportunities, expanding existing ones, and fostering a more robust and sustainable network. This shift will lead to increased demand for specialised manufacturing, engineering, and construction expertise, potentially attracting new companies and skills to the sector.

Further details on the impact of SMRs on the supply chain include:

1. Increased Demand and New Opportunities:

- **Manufacturing Focus:** SMRs will require a greater emphasis on factory fabrication and modular construction, leading to increased demand for specialised manufacturing facilities and technologies.
- **Supply Chain Expansion:** The modular design of SMRs will enable a wider range of suppliers to participate in the construction process, potentially leading to a more diverse and resilient supply chain.
- **New Supplier Relationships:** SMR projects will likely involve new relationships with suppliers in areas like advanced manufacturing, robotics, and automation, as well as those with expertise in managing complex projects.

2. Enhanced Efficiency and Reduced Costs:

- **Standardised Components:** SMRs utilise standardised components, which can lead to streamlined production processes, reduced costs, and faster construction times.
- **Factory-Built Modules:** The factory-built approach allows for better quality control, reduced construction risks, and shorter project timelines.
- **Streamlined Supply Chain:** A more standardised and modular approach can help streamline the supply chain, reduce waste, and improve efficiency.

3. Potential for Job Creation and Economic Growth:

- **High-Skilled Jobs:** The SMR supply chain will require a highly skilled workforce, including engineers, technicians, and manufacturers, creating numerous long-term job opportunities.
- **Economic Impact:** The SMR industry can contribute significantly to economic growth by creating new industries, supporting existing businesses, and attracting investment.
- **Global Competitiveness:** By investing in SMR technology, the UK can enhance its competitiveness in the global nuclear market and become a major player in the clean energy transition.

4. Challenges and Considerations:

- **Regulatory Hurdles:** SMRs will need to navigate complex regulatory landscapes, which could pose challenges for some suppliers.
- **Safety and Security:** Ensuring the safety and security of SMRs and their supply chain will be critical to gaining public acceptance and investor confidence.
- **Resource Availability:** Meeting the demand for SMRs will require a well-developed supply chain for nuclear fuel and other essential materials.

3. Findings and Results

3. Findings and Results

3.1 Methodology and Findings

Summary information is provided with a narrative based on the underlying data which is also provided using bespoke visualisations to enable greater insight and access to detail. The report is aligned to the needs of those responsible for workforce planning – employers, educators, and skills providers. There are three steps used to communicate our findings in the report, as follows:

Step One – How will the Supply chain change - Organisational Changes

Exploration of organisational changes provides insights into how organisations will need to adapt their current capabilities to implement the solutions that respond to the challenge addressed by the foresighting project.

Typically, organisational changes will also require the adoption of new capabilities and a change in the distribution of these capabilities across supply chain partners. The change in capabilities within an organisation as well as their supply chain partners will determine the changes knowledge and skill changes required by the role groups within the workforce of each Supply Chain partner.

Step Two – How will the Workforce change - Occupational Changes

A set of 'Future Occupational Profiles' (FOPs) is produced by the foresight process that demonstrates how current occupations may need to change in the future. FOPs are generated using a combination of attributes from the underlying capability classification and from data collected in the workshops. The FOP generation algorithm works to group capabilities into logical sets reflecting role levels, function, proficiency and capability similarity. As part of the foresight process the generated FOPs are reviewed, revised, and distilled by the Employer group. The agreed set of FOPs are then compared with selected current education provision; the default reference is the set of Institute for Apprenticeships and Technical Education (IfATE, Skills England) apprenticeship standards; to assess which current training and education provision could be used in the future. Two bespoke metrics - match and surplus - are used to evaluate the alignment of current provision with the set of FOPs proposed. Summaries are presented of the key findings related to each Supply Chain partner.

Findings are aimed at both Employers, and Education and Training Providers, and identify matches and gaps in future training needs compared with current provision to guide further detailed investigation.

Step Three – How the current Education provision meets the future need - Highlighted Changes to Future Provision

The report identifies suggested changes to education and training provision – principally apprenticeship standards that will deliver the knowledge, skills and behaviours required by future occupations. In some cases, this will include the development of short courses and continued professional development (CPD) to upskill the current workforce to meet future needs. Additionally, foresighting outputs can be used to develop programmes, qualifications, and apprenticeship standards for new entrants to the workforce joining via apprenticeship, taught qualification, or other training programme.

The insight and data in this part of the report are primarily aimed at educators training providers, apprenticeship standards bodies and awarding organisations. Combined with insight arising from the Supply Chain capability changes, the provision insight offers an effective way for employers to identify training opportunities that align to their future needs.

3.2 Step One – How will the Supply Chain change - Organisational Changes Insight

Organisation functions

The Workforce Foresighting process uses an information architecture built on five functional areas which are common to any business:

Design	The function of an organisation that focuses on activities relating to product, service, or solution design.
Implement	The function of an organisation that focuses on activities relating to producing / making / providing its products or services.
Logistics	The function of an organisation that focuses on activities relating to procurement, delivery, materials, or services necessary for operations – service / manufacturing, etc.
Support	The function of an organisation that focuses on activities relating to users, in-service support, repair / maintenance, recycling, end of life disposal.
Enterprise	Core functions of an organisation - e.g., strategic planning, leadership and management, human resources, digital backbone and data systems, integration of relevant statutory / regulatory requirements and compliance.

The functional structure is developed to levels of detail that enable the foresight process to reference external data sets including ONET (US) Occupational Information Network [9F[1]],

[1] ONET - Occupational Information Network - https://www.onetcenter.org/

ESCO – European Skills, Competences, Qualifications and Occupations[10F[2]], Skills England IfATE (UK) Institute for Apprenticeships and Technical Education[11F[3]] .

The five root functions comprise around 40 domains which are broken down to around 140 functional areas. The architecture is used to position ~ 25,000 capability statements which are the building blocks used in the workforce foresight process. Each capability statement has several attributes - some are static and reflect the position of the capability statement in the architecture, whilst others are dynamic and are assigned values through a cycle and set of workshops.

The data architecture is implemented in a bespoke 'data-cube' which underpins the foresight process, workshops, and enables extensive use of Large Language Models (LLM) and AI tools. Additionally, a key feature of the data-cube is that the data from each foresight topic cycle is added into the data set and can then be used, where relevant, in future cycles. This ensures that the capabilities of the system are dynamic and up to date.

Identifying the Future Supply Chain Capabilities

At the start of this programme there were 3 organisations tendering within the UK SMR competition: Rolls Royce SMR, GE-Hitachi, and Holtec.

In June 2025, the Energy Secretary the Rt Hon Ed Miliband MP announced that Rolls-Royce SMR were selected as the preferred bidder to build the country's first small modular reactors. It is envisaged that a state-of-the-art factory will be built to manufacture the components in a factory setting, rather than on site as the megawatt plants are built. A production line set up may be the preferred option, something which the nuclear sector has not done with previous builds. Working with Rolls-Royce SMR, Great British Energy - Nuclear will aim to allocate a site later in 2025 and connect projects to the grid in the mid-2030s.

Rolls Royce SMR were a key contributor to the foresighting activity including identifying the Supply Chain Capabilities. Rolls Royce SMR may now need to rapidly recruit and deploy people with the right skills at the right time and place.

The following charts and graphs summarise the changes in the set of capabilities that will be required by the supply chain (Supply Chain involved in production) in the future. The pie-charts reflect the distribution of capabilities across the five functions of the capability classification. The future state data is captured in three technology focused workshops. The current state data is derived from information collected on apprenticeship standards used across the current supply chain partners in the sector. This latter information is not as detailed as that produced by the workshops but is indicative and used to provide a point of comparison.

[2] ESCO - European Skills, Competences, Qualifications and Occupations - https://esco.ec.europa.eu/en
[3] IfATE – Institute for Apprenticeships and Technical Education - https://www.instituteforapprenticeships.org/

These initial pie charts (below, see Figure 2) summarise the focus that will be required by the whole supply chain, across the five functions. As the Nuclear SMRs is a new industry emphasis has been placed capabilities in **'Design'** and **'Implementation'.**

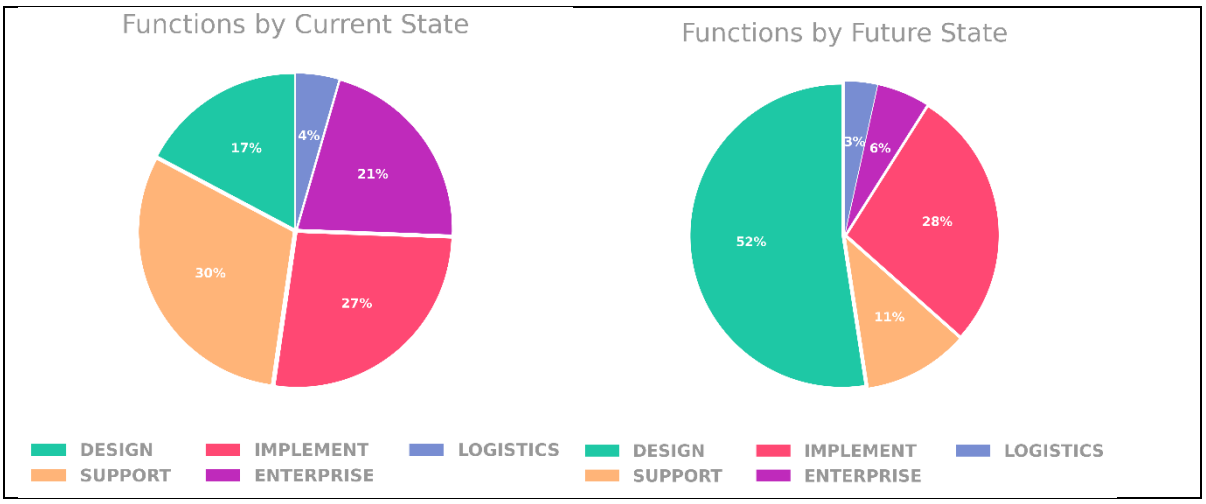


Figure 1: Current and Future – Whole Supply Chain - Capability Function Distribution %

Whilst the information on current and future Supply Chain capabilities is useful to indicate relative changes, factors such as volume of activity will also determine which functions may have greater future significance. The graphs below (see Figure 3-7) show the distribution of capabilities assigned at domain level within the five main functions for this cycle. These graphs provide insight into the relative importance of each domain for the sector in the future.

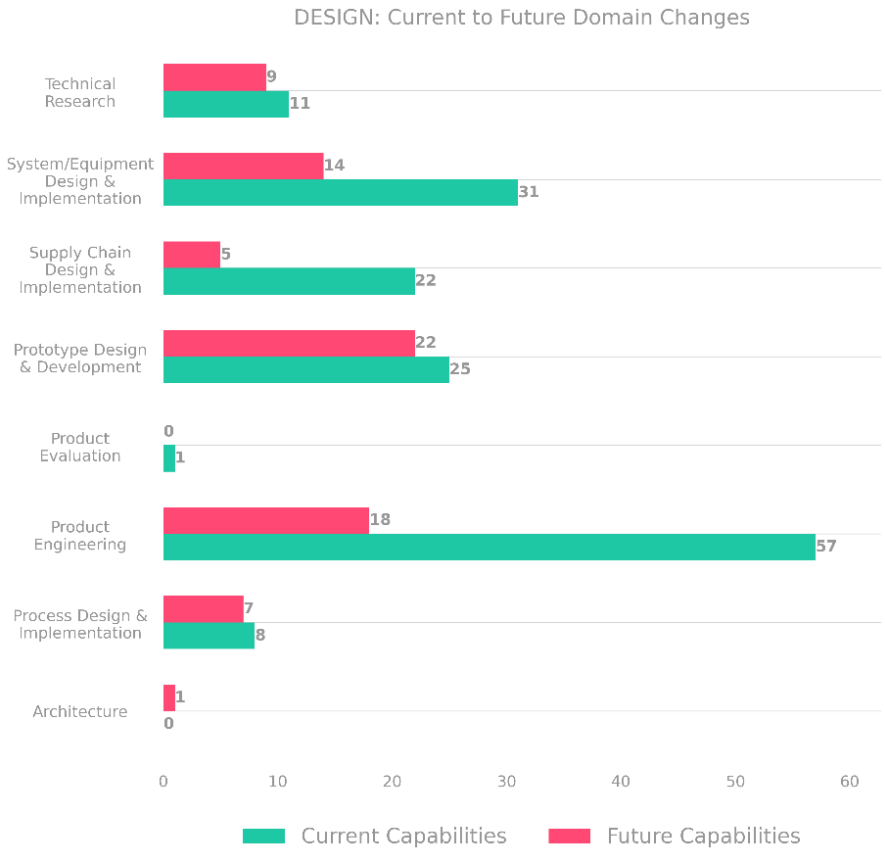


Figure 2: Design Future Domain Spread of Capabilities

Design Domains

The **'Design'** function has the highest number of organisational capabilities **with 76 out of a total of 145 capabilities** for this cycle, reflecting the cycle focus on the **prototype design & development and product engineering** domains.

The reduction across the board of the number of capabilities required in the future shows a focus on those specifically required, (possibly) as a result of the shift from the engineering design toward SMR development and implementation (manufacture).

The current / future comparison for **'Design'** reflects the foresighted transition to an increase in new products, engineering, and evaluation ahead of the development and implementation phase.

Enterprise Domains:

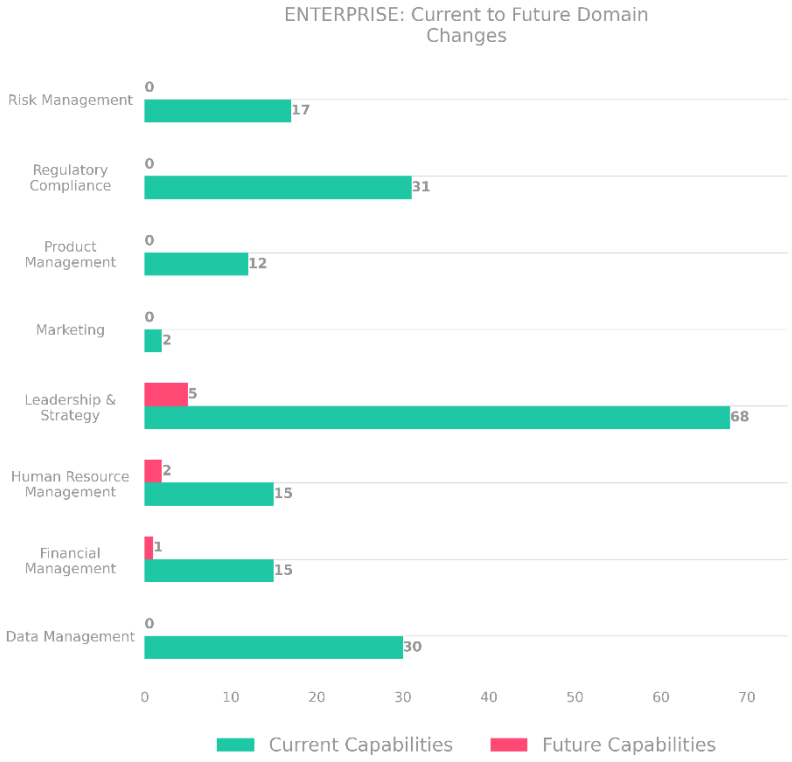


Figure 3: Enterprise Future Domain Spread of Capabilities

The '**Enterprise' function** with 8 capabilities out of 145. Most capabilities sit in the "Leadership & Strategy" domain. Here we can see a growing focus on a reduced set of **'Enterprise'** capabilities, in the domains of "**Leadership and Strategy**," "**Human Resources**" and "**Financial Management**" including identifying new business partnerships for this emerging technology.

The current / future comparisons in the **'Enterprise'** area show the importance of leadership and growth of human resources to 'Implement' the expected increase in manufacturing capacity required to satisfy the future volume/need.

Implementation Domains

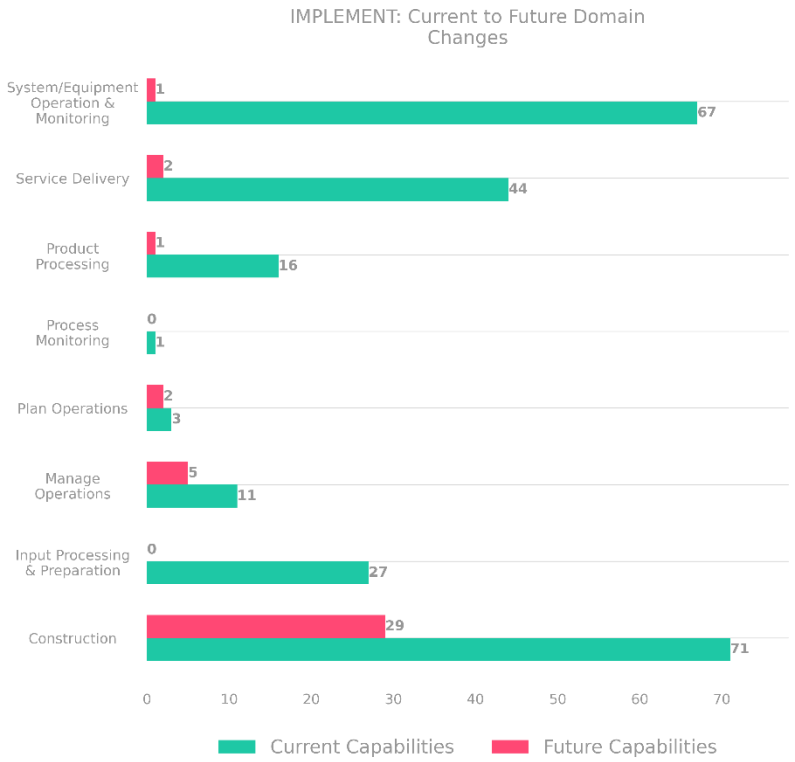


Figure 4: Implementation Future Domains Spread of Capabilities

Of the 145 cycle capabilities for the cycle, **40 sit in the "Implement" function** with most future capabilities in the '**Construction' domain**. With a spread of managing, planning, and delivering operations. Here, we see a shift toward a focus on construction and managing operations to deliver the manufacturing and construction of the new factory and sites for SMR's.

Logistics Domains

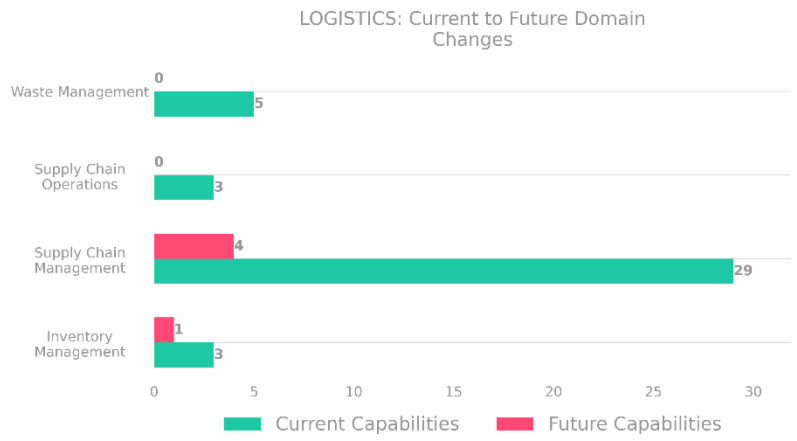


Figure 5: Logistics Future Domains- Future Spread of Capabilities

Only 5 capabilities out of 145 sit in the 'Logistics' function, reflecting the importance of **Supply Chain Management**, for the supply of essential components for SMR manufacturing & construction. Of those five capabilities, they operate in the functional areas of identifying and working with suppliers; monitoring inventories; coordinating logistics; and providing transport services.

The current and future comparison for 'Logistics' is as expected for organisations gearing up to work at a higher scale of production.

Support Domains

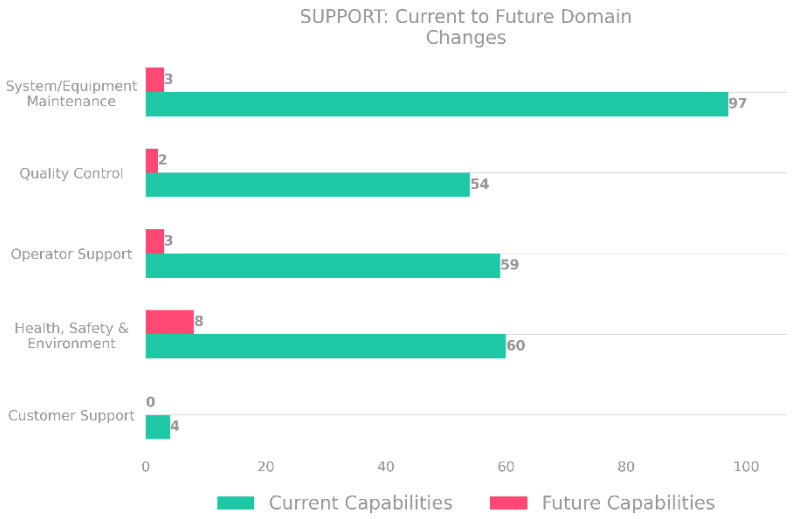


Figure 6: Support Future Domains - Future Spread of Capabilities

The **'Support'** function has **16 capabilities of the 145 for the cycle**, with the **'Health, Safety & Environment'** domain being the highest. The current and future 'Support' comparison reflects a shift toward a more focused area of capabilities across the domains under the 'Support' function.

The current and future 'Support' comparison reflects the current prominent levels of Health and Safety – the reduction in proportions may be due to the focus on 'Design' and 'Implement' during data gathering and analysis.

Visualisation Instructions

Detailed instructions can be found in the appendix.

Visualisation Data Link	What is it and what can it be used for?
Data Capture Overview | HVMC Foresighting	*The page provides details of the capabilities required by each supply chain partner and the supply chain as whole. The information is presented using the Capability Classification Framework, Design / Implement / Logistics / Support / Enterprise and can be interrogated and then exported to suit specific user requirements and interest.* *The information provided also identifies capabilities supported by existing provision, and where there may be gaps that require new development to support to equip the future workforce.*

3.3 Step Two – How will the Workforce change - Occupational Change Insight

Insight into occupational change uses the understanding of how capabilities will change across business functions (section 3.2) to inform proposals for how occupations and their associated skills sets for each supply chain partner may need be revised to reflect change for each role level within that partner.

Supply Chain partner organisation types

The workforce foresighting process recognises that different partners in a Supply Chain will require appropriate capabilities, and these are determined and agreed in the initial workshops. In this cycle, the following Supply Chain partners were identified and then used during participant workshops and data analysis to determine the organisational needs:

- **SMR Prime**
  The main developer of SMRs is a Systems of Systems integrator, designs and manufactures advanced nuclear reactors, providing scalable, safe, and efficient energy solutions. They collaborate with suppliers to source high-quality materials and components, ensuring reactor integrity and reliability. Their expertise in regulatory compliance and project management facilitates seamless integration into existing energy infrastructures. Supply chain stakeholders benefit from their innovative technology, commitment to sustainability, and strong, collaborative relationships that drive mutual success.

- **Regulators**
  Regulatory bodies ensure safety, security, and environmental protection, including Office for Nuclear Regulation (ONR) and Environment Agency (EA) in England, Scottish Environmental Protection Agency (SEPA) and Natural Resources Wales to ensure that the nuclear industry operates safely and responsibly, protecting both people and the environment. Note: Although included as one of the supply chain partners, emphasis was placed on nuclear engineering. More work on this cycle can be picked up at a later date once the design of the SMRs have been finalised and Regulators have a better understanding of the workings of SMRs.

- **Large Component Manufacturer**
  Producers (Tier 1 and 2) of essential components such as steam generators, reactor vessels, heat exchangers, pumps, pipework etc. They may not always be UK based companies as the UK does not have the capability to produce certain items.

- **Component Supplier**
  These will be Tier 2, 3 & 4 companies who will supply systems, components, and services to the SMR factory/site. These could include valves, pumps, fasteners, electrical switches, supports, piping, and specialist services such as consultancy etc.

- **Module Factory**
  Offsite manufacturing factory to produce up to 1500 shipping container sized modules, which are clustered, to provide the necessary systems within the nuclear SMR. Larger components such as the RPV & Turbine Island may also be retrofitted in this factory and QA prior to delivery to site by transportation. The factory is presumed to be directly owned /controlled by the Prime.

- **Sites, Civils MEHVAC Engineers EPC**
  Integrated Engineering and Construction Services. The site where the SMR will be built will need preparation and nuclear concrete foundations and services installed by a civil engineering organisation and contractors to specification, prior to delivery and installation of the modules and major components from the module factory. The site will also need to be made secure (fencing/ perimeter) and can also include a canopy against adverse weather conditions whilst the modules are installed. EPC contractor provides a full engineering, design, construction, supply, and installation service

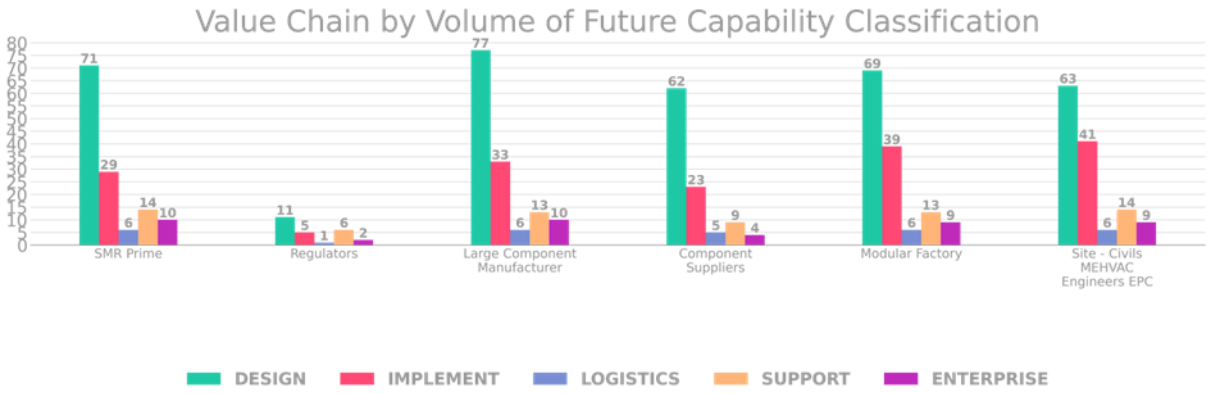


Figure 7: Distribution of Functions across each Supply Chain Partner by the number of capabilities

The bar charts shown above in Figure 8 illustrates the distribution of capabilities by function across the Supply Chain Partners. These capability sets are used to form the set of Future Occupational Profiles within each Role Level. Here we can see the focus of the sector on pre-the manufacturing and construction of SMR's of the preparation with **'Design' & 'Implementation'**.

It can also be observed that the profiles are broadly similar across the supply chain partners, apart from Regulators. Showing **commonality of needs**, which is useful when planning the future actions/ skills interventions required.

Visualisation Instructions

Detailed instructions can be found in the appendix

Visualisation Data Link	What is it and what can it be used for?
Supply Chain Capabilities	*This page provides an overview of the identified capabilities at a Supply Chain Partner level.* *By selecting/deselecting each Supply Chain Partner you can review the capabilities identified as required in that area of the Supply Chain.* *This can be used to generate organisational capability profiles for each area of the Supply Chain to help prioritise and focus the acquisition of new capabilities that will be required in the future.* *It can also be used to generate combined organisational profiles, where an organisation may be involved in more than one area of the Supply Chain.*

Role Levels

The foresighting adopts the concept of Role Levels to represent future occupations. Utilising this approach acknowledges that the workforce is not homogeneous, and there are various levels of proficiency required across a workforce. Requiring different qualifications and training and types of vocational or academic qualifications. Additionally, the role-level approach seeks to avoid presuming that the future workforce will be operating at a different level to the current state. Role Levels determined through workshops:

RL	Role Level	Description	Grade / Experience	Academic level
1	Technician / Operator	Use engineering knowledge and understanding to apply technical and practical skills. Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems, or services. Accept and exercise personal and team responsibility. Includes welders, pipe fitters, craft skills etc	0 to 5 yrs experience, in addition to time to achieve qualification	Eng Tech Level 1/2/3
2	Technician / Supervisor	Use engineering knowledge and understanding to apply technical and practical skills. Support the design and development including test and validate. Carry out manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems, or services. Contribute to testing and validation by informing engineers on requirements. Accept and exercise personal and team responsibility. Includes supervisory charge hand etc	3 to 5 yrs experience, in addition to time to achieve qualification	Eng Tech Level 3/4/5
3	Technical Engineer	Use a combination of general and specialist engineering knowledge and understanding to apply existing and emerging technology. Apply appropriate theoretical and practical methods to design, develop, manufacture, construct, commission, operate, maintain, decommission and re-cycle engineering processes, systems, services, and products. Includes Project Management, engineers, controllers etc.	Director, Manager 0 to 3 yrs experience, in addition to time to achieve qualification	Incorporated Engineer, IEng Level 6/7 limited experience
4	Professional Engineer	Use engineering knowledge and understanding to apply technical and practical skills. Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems, or services. Accept and exercise personal and team responsibility. Includes Programme Management and enterprise skills, Finance, People Management, Business Management, etc	Director, Manager 4 to 8 yrs experience, in addition to time to achieve qualification	Chartered Engineer, CEng Level 7 and Above or equivalent experience

Proficiencies

Each of these role levels will require proficiency that reflects their role and the needs of each Supply Chain Partner. The foresight process uses a three-point scale to capture and differentiate the proficiencies required. This information is used both in the generation of the Future Occupational Profiles, and to assist the definition of training needs identified. Within the workforce foresight process proficiency is defined as:

Awareness (A) - Has a foundational knowledge of tools, technology, techniques relevant to sector, industry, or organisation. Sufficient comprehension to know where to seek further information/details as necessary for a particular issue.

Practitioner (P) - Has the ability to apply and use independently a tool, system, or process. Understands the implications, consequences, and impact for their role/function. A Practitioner knows what key actions are required and in what context.

Expert (E) - Has detailed knowledge of process, system, tool, or technology. Can support others and identify improvements required for a process, system, or tool. An Expert can implement improvements personally or direct and guide others.

During the workshops participants applied their insight to assign proficiency for each Role Level to each capability. Individual responses were aggregated by the system to arrive at a consensus.

A summary of the distribution of required proficiency for the role levels in this cycle are shown in the table below and the bar charts (Figure 9) across the 22 Future Occupational Profiles (FOPs) which are distributed across the supply chain partners.

It can be seen from the figures that there is more emphasis on higher skills levels required in the nuclear industry for SMR Manufacturing and Construction. This is as a result of the focus of this cycle being more on the design and implementation stage of the build with this being a new industry.

Role Level \ Proficiency	Technician / Operator	Technician / Supervisor	Technical Engineer	Professional Engineer
Awareness	1	5	11	1
Practitioner	9	33	86	54
Expert	3	8	131	85

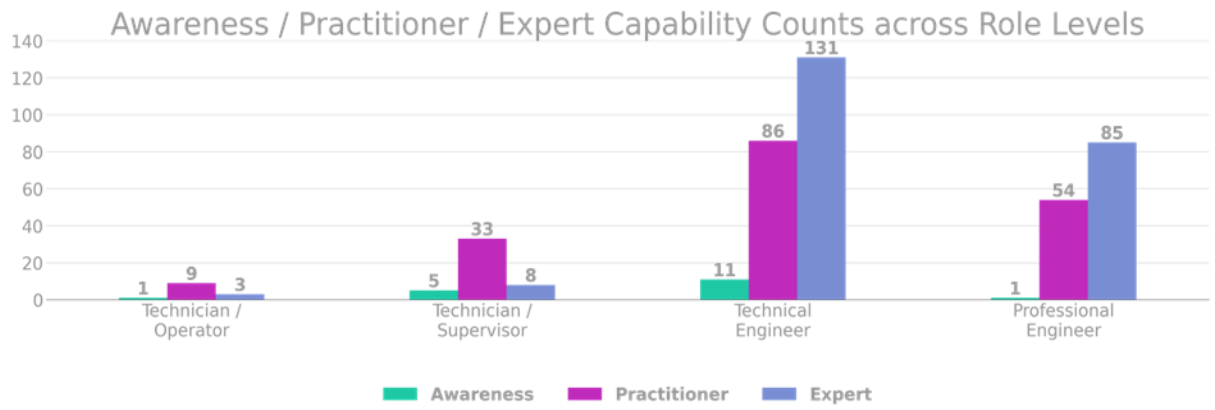


Figure 8: Proficiency details by Role Level with number of capabilities per FOP proficiency

Future Occupational Profiles

FOPs are used to describe and suggest occupations, or roles, that may be required in the future and provide a framework to indicate capabilities and related duties. They can be used to review the impact on current roles and the adaptation that may be required in the future.

Educators can review current apprenticeship standards against the requirements of the FOPs and interpret which need to be changed to fill the gaps between the current and future state.

Employers can consider existing apprenticeship standards and make a judgement on adapting an existing apprenticeship standard to upskill their workforce to meet the requirements of a particular FOP.

FOPs and indicative skills need

Combining proficiency with the identified FOPs, the following graphs indicate the priority needs across the supply chain for each Role Group to deliver future capabilities.

Technician / Operator Role Level FOPs:

In this cycle the Technician / Operator role level was defined as occupations and roles requiring Level 1 to 3 qualifications or apprenticeships.

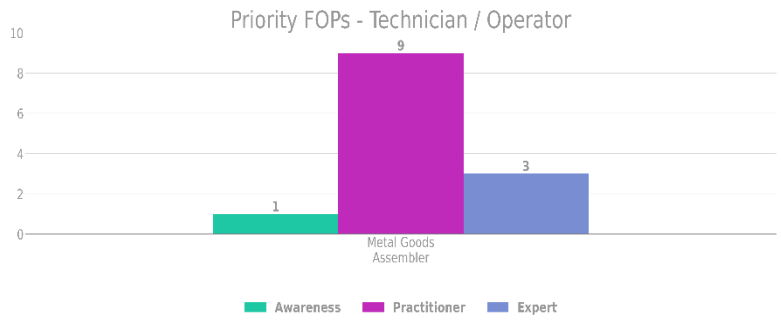


Figure 10: Priority FOPs - Technician / Operator Role Level with number of capabilities per FOP by proficiency level

Technician / Supervisor Role Level FOPs:

In this cycle the Technician / Supervisor role level was defined as occupations and roles requiring Level 3 to 5 qualifications or apprenticeships.

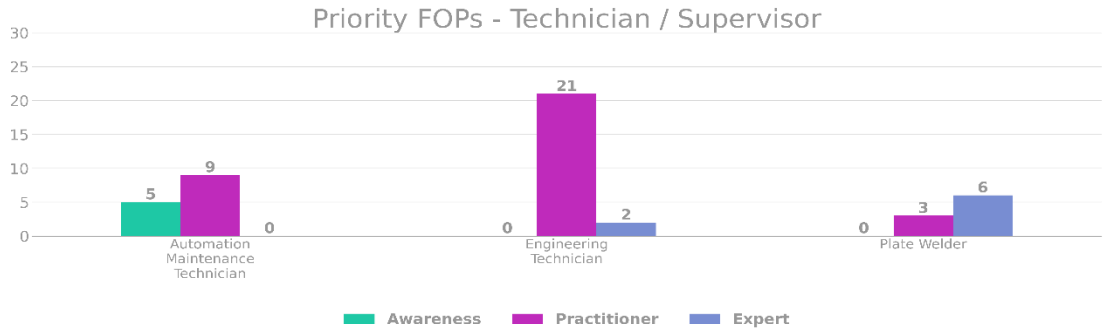


Figure 11: Priority FOPs - Technician / Supervisor Role Level with number of capabilities per FOP by proficiency level

Focus could be placed on functional areas like **Install Equipment**, **Create Engineering Designs**, and **Build Facilities & Structures** to ensure operational excellence, technical precision, and operational readiness.

Technical Engineer Role Level FOPs:

In this cycle the Technical Engineer role level was defined as occupations and roles requiring Level 6 to 7 qualifications or apprenticeships.

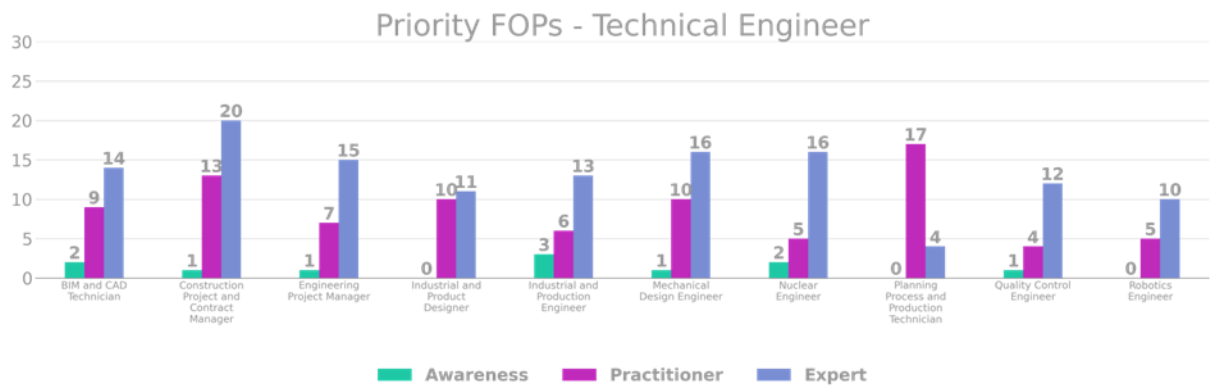


Figure 12: Priority FOPs - Technical Engineer Role Level with number of capabilities per FOP by proficiency level

With complex project delivery and innovation, a priority is in building expert-level capability in key domains such as **Project Management**, **Product Design & Development**, **Digital Engineering**, **Robotics & Automation** with a particular focus on functional areas like **Create Engineering Designs** and **Plan & Manage Construction**.

Professional Engineer Role Level FOPs:

In this cycle the Professional Engineer role level was defined as occupations and roles requiring Level 6 to 8 qualifications or apprenticeships.

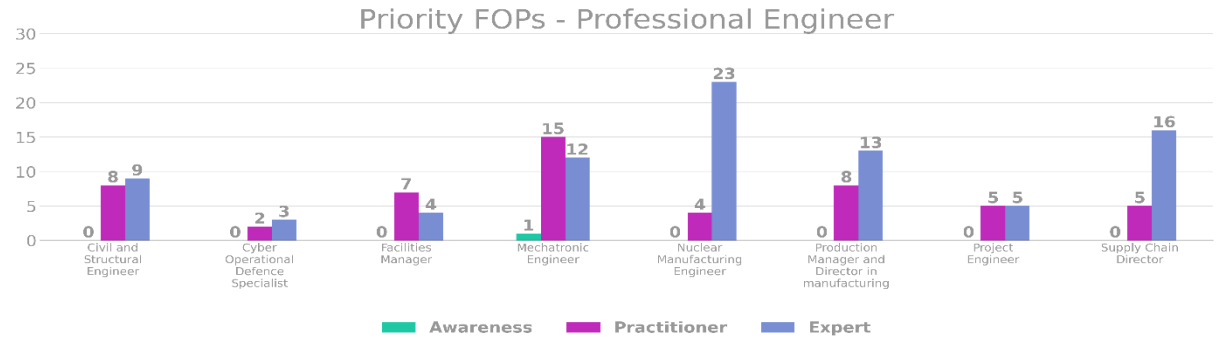


Figure 13: Priority FOPs - Professional Engineer Role Level with number of capabilities per FOP by proficiency level

Nuclear manufacturing/ engineering expertise is a must. **Prototype Design & Development**, **Product Engineering** and **Construction** are strong Expert domains and critical areas for innovation and delivery. Alongside: **Create Engineering Desings**, **Design Systems and** Application to lead on technical excellence. Is **Health, Safety & Environment** and **Maintain Safety & Security** at practitioner level highlighting a need to develop more strategic leadership in these areas at Professional Engineer Role Level.

FOPs across Supply Chain Partners

The distribution of Future Occupational Profiles (22 in total) by Role Level and supply chain such are shown in the table below. It can be seen that most of the FOPs cut across four of the five supply chain partners. This is a useful indication as it means that the skills already exist widely across the whole sector and will aid in the movement of people between supply chain companies as the SMRs moves through the various stages of construction.

RL	FOP	SMR Prime	Regulator	Large Component Manufacturer	Component Suppliers	Modular Factory	Sites – Civils MEHVAC Engineers EPC
1	Metal Goods Assembler			o	o	o	o
2	Automation Maintenance Technician			o	o	o	o
	Engineering Technician			o	o	o	o
	Plate Welder			o	o	o	o
3	BIM and CAD Technician	o		o	o	o	o
	Nuclear Engineer	o	o	o	o	o	
	Engineering Project Manager	o		o	o	o	o
	Mechanical Design Engineer	o		o	o		
	Mechatronic Engineer	o		o	o	o	
	Project Engineer	o		o	o	o	o
	Industrial and Product Designer			o	o		
	Quality Control Engineer	o		o	o	o	o
	Industrial and Production Engineer			o	o	o	
	Planning Process and Production Technician			o	o	o	
	Robotics Engineer			o	o	o	o
	Facilities Manager			o	o	o	o
	Construction Project and Contract Manager						
4	Supply Chain Director	o		o	o	o	o
	Cyber Operational Defence Specialist	o		o	o	o	o
	Production Manager and Director in manufacturing			o	o	o	
	Nuclear Manufacturing Engineer			o		o	
	Civil and Structural Engineer						o

Visualisation Instructions

Detailed instructions can be found in the appendix.

Visualisation Data Link	What is it and what can it be used for?
Prototype Future Occupational Profile (P-FOP) Matrix | HVMC Foresighting	*This page provides a detailed breakdown of future occupational profiles that could be required in the future workforce. These were generated using a combination of attributes collected through the workshops and an algorithm. These suggested profiles were then reviewed and ratified by small groups of employers who were able to add/remove capabilities and uprate/downrate proficiency levels required.* *You can view all the FOPs in a role level by selecting one (or more) of these from the drop down. This will then allow you to select the FOPs aligned to that role level.* *The populated table allows you to review and compare different FOPs within or across role levels. You can view the capabilities in each FOP and the assigned proficiency levels.*

3.4 Step Three – How the current Education provision meets the future need - Highlighted Changes for Future Provision

The Workforce Foresighting process has developed two metrics to quantify the alignment between a FOP and a current standard or qualification:

Fit – expressed as a %, it is a measure of the proportion of a FOP that is covered by an existing standard or qualification.

Surplus – expressed as a %, it is a measure of the not relevant material in an existing standard that is not required for a FOP.

An ideal existing qualification or standard would have a high fit and low surplus – this implies good coverage of the FOP but with little material that is not relevant to the FOP. Conversely a poor candidate would have a low fit and high surplus. Using these two metrics it is possible to quantitively evaluate, rank, and compare a range of existing provisions against a set of FOPs describing future needs.

Our interpretation is represented by a simple nine-box model to position the suitability of a given current occupational standard to a future occupational profile:

Factor scores

Fit Factor	Fit score	Surplus Factor	Surplus score
0 - 32%	1	81-100%	1
33-65%	2	51-80%	2
66-100%	3	0 - 50%	3

(Multiplying the Fit score by the Surplus score gives a Suitability Grid score of 1-9 as below)

Suitability Grid

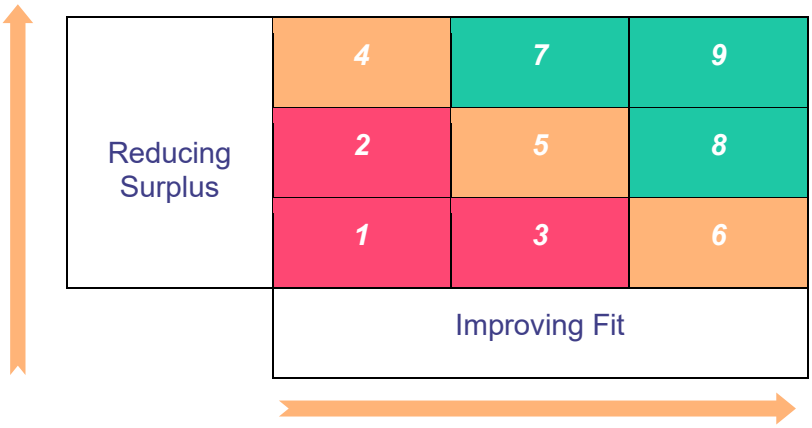


Figure 14: Fit Factor scores and Suitability Grid

Using this score and indicated 'RAG status' the following interpretations can be made:

High Suitability – 7,8,9 – for standards that have good coverage of FOPs.
Represents good candidates from current apprenticeship standards used as the basis of development to meet FOP requirements and inform elements of short course and CPD provision.

Some Suitability– 4,5,6 – for standards that have only partial coverage of FOPs.
These are likely to require extended work to meet FOP requirements, further review of the data may be necessary. They are likely to contain some useful information to inform elements of short course and CPD provision.

Low Suitability – 1,2,3 – for standards that have poor coverage of FOPs.
These are unlikely to be adaptable to meet future needs but may contain some useful information to inform elements of short course and CPD provision, which can be assessed using the data visualisation tools.

FOP findings compared with current standards

Using the approach described above and applying the 'RAG' scores to each FOP indicating the suitability of current apprenticeship standards selected from the Skills England IfATE set, the following table begins to identify areas of action and concern for the provision of future skills for each Supply Chain Partner to respond to the challenge.

All Future Occupational Profiles (FOPs) have Some to Low suitability to Skills England IfATE provision and may require new or adapted training programs highlighting critical areas where targeted capability development will be essential to meet future operational demand.

Supply Chain Partner - SMR Prime

Role Level (RL)	Selected Future Occupational Profiles	Current Suitability Summary
Technical Engineer	Nuclear Engineer	Low
Technical Engineer	Mechanical Design Engineer	Low
Technical Engineer	Engineering Project Manager	Some
Technical Engineer	BIM and CAD Technician	Low
Technical Engineer	Quality Control Engineer	Low
Professional Engineer	Supply Chain Director	Low
Professional Engineer	Mechatronic Engineer	Low
Professional Engineer	Project Engineer	Some
Professional Engineer	Cyber Operational Defence Specialist	Low

Detailed breakdown:

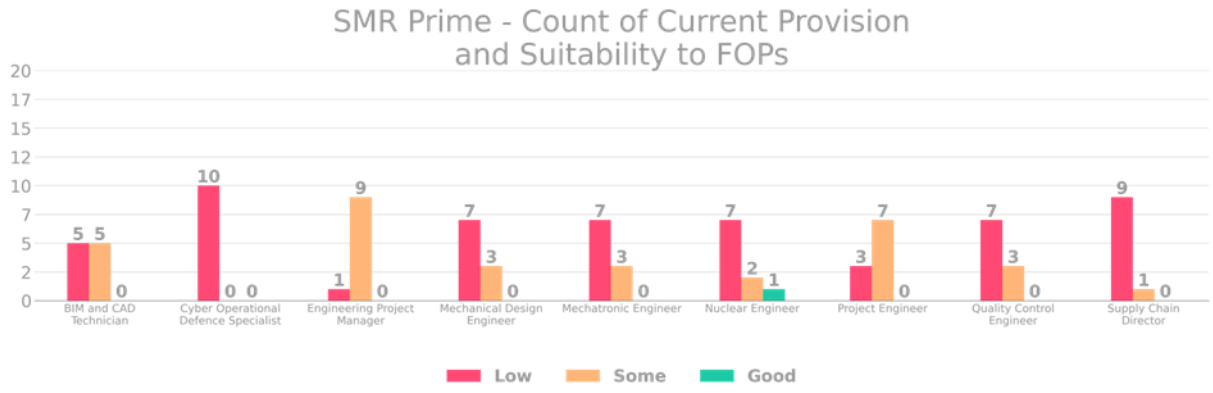


Figure 15: Suitability Summary - SMR Prime

Supply Chain Partner - Regulators

Role Level (RL)	Selected Future Occupational Profiles	Current Suitability Summary
Technical Engineer	Nuclear Engineer	Low

Detailed breakdown:

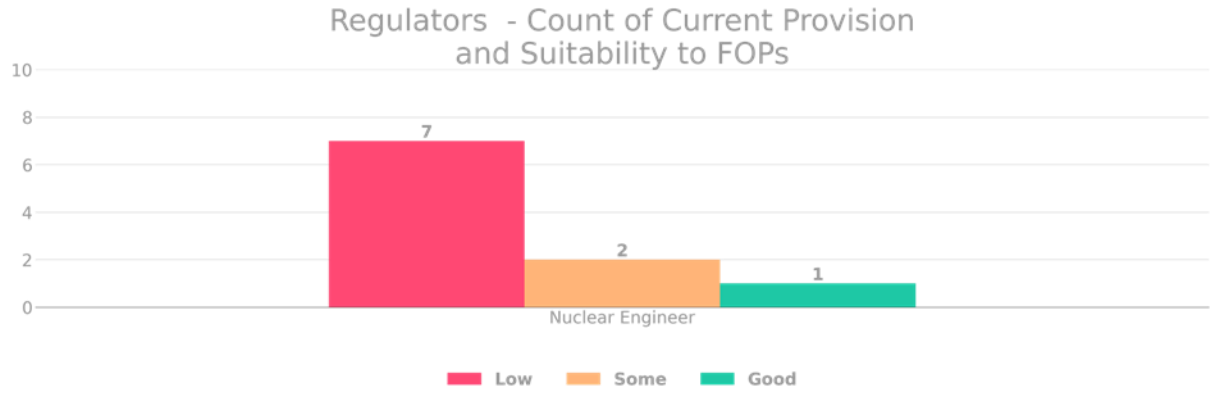


Figure 16: Suitability Summary - Regulators

Supply Chain Partner - Large Component Manufacturer

Role Level	Selected Future Occupational Profiles	Current Suitability Summary
Technician / Operator	Metal Goods Assembler	Some
Technician / Supervisor	Plate Welder	Some
Technician / Supervisor	Automation Maintenance Technician	Low
Technician / Supervisor	Engineering Technician	Low
Technical Engineer	BIM and CAD Technician	Low
Technical Engineer	Quality Control Engineer	Low
Technical Engineer	Planning Process and Production Technician	Some
Technical Engineer	Nuclear Engineer	Low
Technical Engineer	Robotics Engineer	Low

Technical Engineer	Industrial and Production Engineer	Low
Technical Engineer	Industrial and Product Designer	Low
Technical Engineer	Engineering Project Manager	Some
Technical Engineer	Mechanical Design Engineer	Low
Professional Engineer	Supply Chain Director	Low
Professional Engineer	Production Manager and Director in manufacturing	Low
Professional Engineer	Project Engineer	Some
Professional Engineer	Nuclear Manufacturing Engineer	Low
Professional Engineer	Cyber Operational Defence Specialist	Low
Professional Engineer	Mechatronic Engineer	Low
Professional Engineer	Facilities Manager	Some

Detailed breakdown:

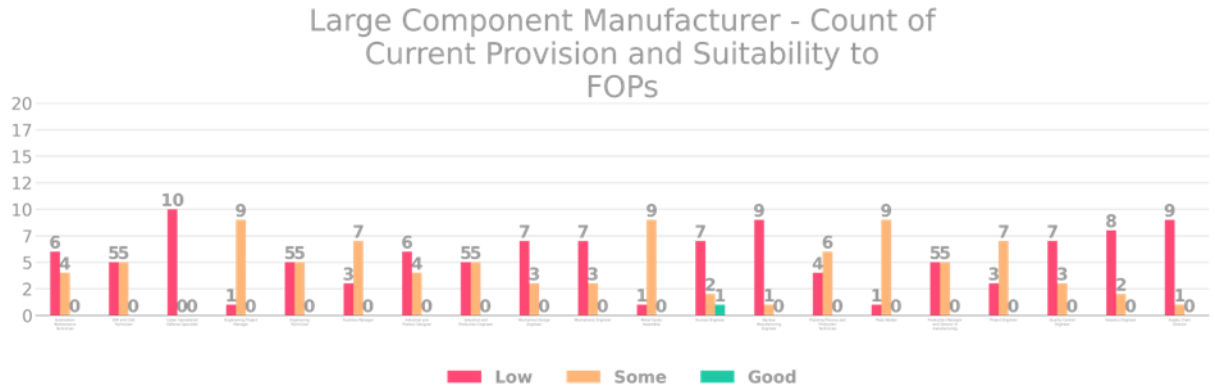


Figure 17: Suitability Summary - Component Supplier

Supply Chain Partner - Component Suppliers

Role Level	Selected Future Occupational Profiles	Current Suitability Summary
Technician / Operator	Metal Goods Assembler	Some
Technician / Supervisor	Automation Maintenance Technician	Low
Technician / Supervisor	Plate Welder	Some
Technician / Supervisor	Engineering Technician	Low
Technical Engineer	Mechanical Design Engineer	Low
Technical Engineer	Industrial and Production Engineer	Low

Technical Engineer	Engineering Project Manager	Some
Technical Engineer	Industrial and Product Designer	Low
Technical Engineer	Robotics Engineer	Low
Technical Engineer	Quality Control Engineer	Low
Technical Engineer	Nuclear Engineer	Low
Technical Engineer	Planning Process and Production Technician	Some
Professional Engineer	Facilities Manager	Some
Professional Engineer	Cyber Operational Defence Specialist	Low
Professional Engineer	Project Engineer	Some
Professional Engineer	Supply Chain Director	Low
Professional Engineer	Production Manager and Director in manufacturing	Low
Professional Engineer	Mechatronic Engineer	Low

Detailed breakdown:

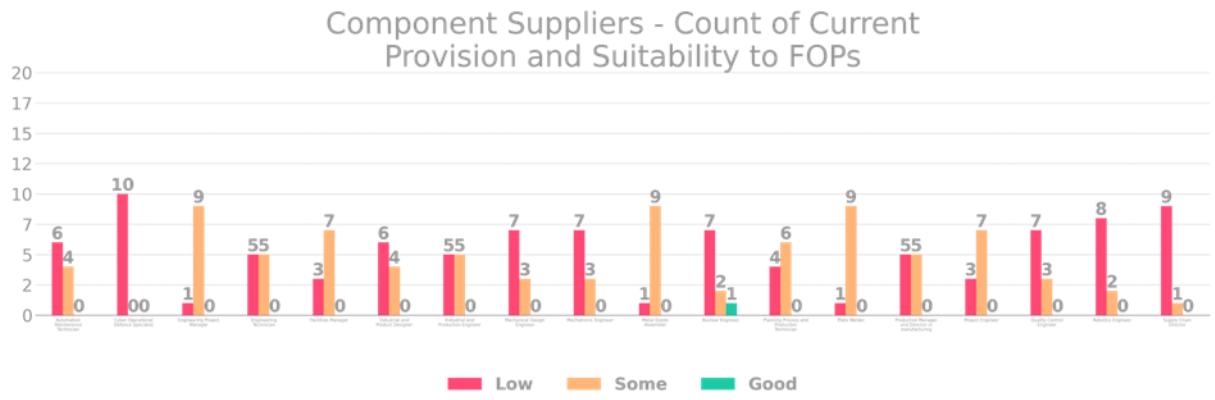


Figure 18: Suitability Summary - Component Supplier

Supply Chain Partner - Modular Factory

Role Level	Selected Future Occupational Profiles	Current Suitability Summary
Technician / Operator	Metal Goods Assembler	Some
Technician / Supervisor	Automation Maintenance Technician	Low
Technician / Supervisor	Plate Welder	Some
Technician / Supervisor	Engineering Technician	Low
Technical Engineer	Industrial and Production Engineer	Low
Technical Engineer	Engineering Project Manager	Some
Technical Engineer	BIM and CAD Technician	Low
Technical Engineer	Robotics Engineer	Low
Technical Engineer	Quality Control Engineer	Low
Technical Engineer	Planning Process and Production Technician	Some
Technical Engineer	Nuclear Engineer	Low
Professional Engineer	Supply Chain Director	Low
Professional Engineer	Facilities Manager	Some
Professional Engineer	Mechatronic Engineer	Low
Professional Engineer	Production Manager and Director in manufacturing	Low
Professional Engineer	Project Engineer	Some
Professional Engineer	Nuclear Manufacturing Engineer	Low
Professional Engineer	Cyber Operational Defence Specialist	Low

Detailed breakdown:

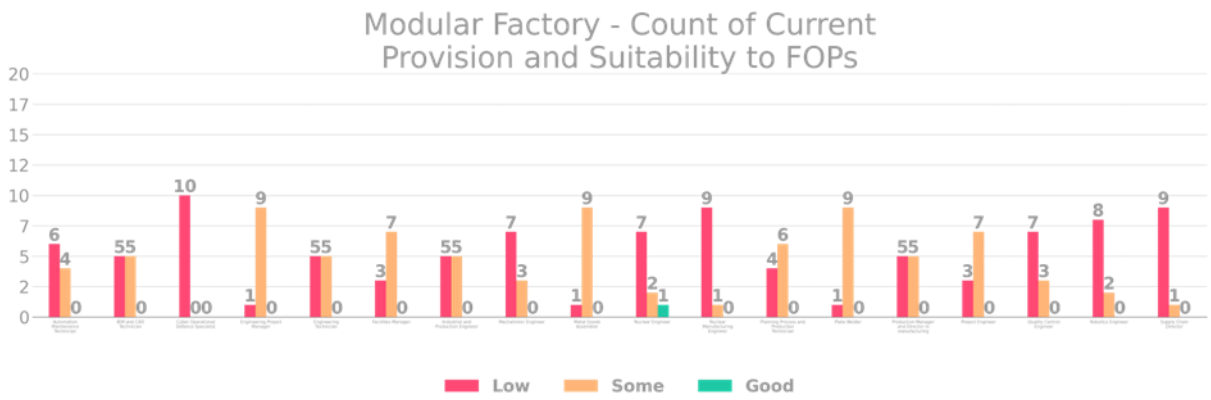


Figure 19: Suitability Summary - Modular Factory

Supply Chain Partner - Site - Civils MEHVAC Engineers EPC

Role Level	Selected Future Occupational Profiles	Current Suitability Summary
Technician / Operator	Metal Goods Assembler	Some
Technician / Supervisor	Engineering Technician	Low
Technician / Supervisor	Automation Maintenance Technician	Low
Technician / Supervisor	Plate Welder	Some
Technical Engineer	Construction Project and Contract Manager	Some
Technical Engineer	Engineering Project Manager	Some
Technical Engineer	BIM and CAD Technician	Low
Technical Engineer	Quality Control Engineer	Low
Technical Engineer	Robotics Engineer	Low
Professional Engineer	Supply Chain Director	Low
Professional Engineer	Facilities Manager	Some
Professional Engineer	Project Engineer	Some
Professional Engineer	Civil and Structural Engineer	Low
Professional Engineer	Cyber Operational Defence Specialist	Low

Detailed breakdown:

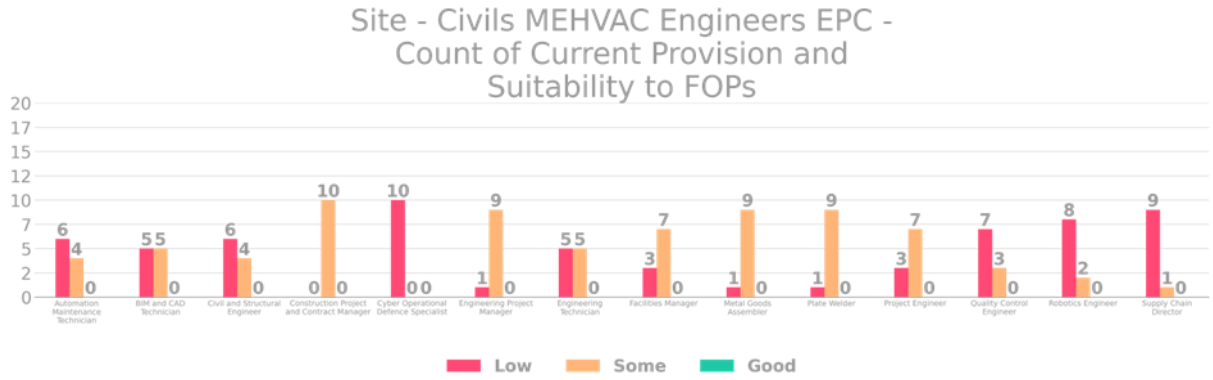


Figure 20: Suitability Summary - Site - Civils MEHVAC Engineers EPC

Link to full data set - Visualisation Instructions

Visualisation Data Link	*What is it and what can it be used for?*
FOP Detail	*This page allows you to review a specific Occupational Profile, including the capabilities contained within it and the Knowledge, Skills & Behaviour (KSB) tags associated with the capability.* *You can select an individual Role Level and linked FOP in the two available dropdowns. The table in the lower section of the page will then be populated with all relevant capabilities.* *The search control above the table allows you to filter content of any of the columns of data. A key piece of functionality in this table is the presence of the KSB tags associated with the capabilities.*
Future KSBs Summary	*This page provides a view of the complete set of capabilities within the cycle along with all the associated KSB tags which are linked to them. It is the superset of all details displayed on the Fop detail page.* *This is used to:* • *To review the identified Knowledge, Skill and Behaviour tags for a given capability, to support development of future education and learning material.* • *To review the requirements from a capability level, rather than a role level/occupational profile grouping.*
Capabilities Matched to Current Provision	*This page allows you to review and compare individual capabilities against 'Duty' statements in an Apprenticeship / Occupational Standard.* *You can select individual capabilities to review their specific matches.* *These matches are shown in the bottom panel, including the Standard, the Level, and the Duty Statement this is matched to.* *You can filter in several ways to focus your review:* • *By the Capability Classification Framework (left-hand panel).* • *By capabilities that **are** served by the reference mapping framework – the default is Institute for Apprenticeships and Technical Education (IfATE) provision.* • *By capabilities that **are not** served by the reference mapping framework, e.g., IfATE provision – these are capabilities required in the future that may require new/bespoke training and CPD materials to be developed to upskill/re-skill the workforce.* *This page can be used to identify where existing provision may exist across the broad spectrum of Apprenticeship standards, and not just within a narrow range of sector-specific Standards.* *The data also allows you to identify where provision may already exist to support specific capabilities.*
Fit & Surplus Factors	*This page allows you to review the 'Fit' and 'Surplus' of Prototype Future Occupation Profiles (FOP) against existing training provision e.g. Institute for Apprenticeships and Technical Education (IfATE).* *It is possible for the 'Fit' and 'Surplus' comparison to total over 100%, as they are two separate calculations based on a two-way comparison.*

Fit & Surplus Matrix	*This page is a visual representation of the 'Fit and Surplus Factor' insight. You can visually review 'Fit' and 'Surplus' of Prototype Future Occupation Profiles (FOP) against existing training provision e.g. Institute for Apprenticeships and Technical Education (IfATE).* *This can help you identify which provision may align strongest, or which may require adaptation, to provide the suitable provision fit for each future role.* *It will help you focus in on which provision to focus your attention for analysis.*
FOP Capability Matches	*This page allows you to view the matches between Capabilities and Institute for Apprenticeships and Technical Education (IfATE) Duty Statements. Clicking the arrow next to a number in the 'Matches' column will open a popup with more detail for each Capability.* *Each capability also includes Knowledge, Skill, and Behaviour Tags, to support with scaffolding future education provision.* *You can review individual Prototype Future Occupational Profiles (FOPs) or review all FOPs under a Role Level, to give a more holistic view of Capabilities and Matches* *Where a future capability has been matched to existing provision (currently, by default, IfATE apprenticeship standards) it is possible to interrogate the data and identify specific statements in standards that align to enable identification of existing training materials and activities that could be used or adapted to meet future requirements.* *This can be used to review the capability requirements for Role Levels and FOPs, from Job / Occupation level through to Knowledge, Skill, and Behaviour level*

4. Conclusion and Next Steps

4. Conclusion and Next Steps

4.1 Summary of Key Insights

- As part of this study, **145 Future Capabilities** were identified, leading to **22 Future Occupational Profiles**, with **4 Roles Levels**, across **6 supply chain partners**. This information will be of use to HR specialists and the leadership of the industrial organisations involved with SMR manufacture and installation.

- Surprisingly, gaps were evident in all the courses currently available (within the limitation of our search) to satisfy the needs of Future Occupational Profiles (FOPs). All courses for each supply chain partner were in the low to some suitability category. (Amber to Red). Showing that whilst current apprenticeships may satisfy part of the requirements of the future industry needs, the gaps need bridging, and it is across all FOPs.

- There is a commonality of future capability profiles across all supply chain partners except the Regulators. This commonalty will provide a strong talent (cluster of SQEP) pool and progression once developed. It is also beneficial for collaborating organisations to sponsor shared training programs to be of critical mass to ensure their viability. (An important consideration for educationalists when considering whether to develop new training programmes).

- There is a skew towards high-level education (level 7) with a focus on ‘Design’ and ‘Implementation’ with a requirement for all (industry wide) to be educated in Nuclear Health, Safety, and the Environment. This should be accessible to all participants in industry alongside Cybersecurity, which is also a significant industry requirement.

- With the development and deployment of SMR’s as new industry, the other modulation industries could use this model and partner in this area across functional areas: digitalisation, manufacture, and construction.

- Besides the new technical requirements for SMR’s we are seeing an increased emphasis on construction skills with site preparation and delivery of modules to site. These have and are changing rapidly with the take-up of digitalisation, modelling & simulation (BIM) and the adoption of automation tools (robotics).

The table below counts the number of Skills England (IfATE) standards by Suitability Score for each FOP. For the purpose of this report, we have utilised the suitability grid to highlight the top ten Skills England IfATE standards that support each FOP. The table identifies if they have low, some or high suitability and colour-coded their overall suitability. The use of the data visualisation tool is recommended to access the next layer of detail and review the specific standards that have been identified as having Some Suitability or Low Suitability.

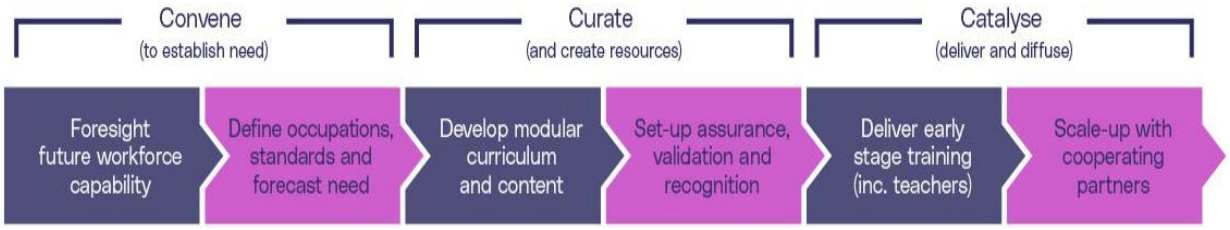
Role Level	Primary Supply Chain / Supply Chain Partner	Future Occupation Profile	Suitability			
			Low	Some	High	Overall RAG
Technician / Operator	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Metal Goods Assembler	4	6	0	Some
Technician / Supervisor	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Automation Maintenance Technician	9	1	0	Low
Technician / Supervisor	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Engineering Technician	9	1	0	Low
Technician / Supervisor	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Plate Welder	6	4	0	Some
Technical Engineer	Site - Civils MEHVAC Engineers EPC	Construction Project and Contract Manager	5	5	0	Some
Technical Engineer	Large Component Manufacturer, Component Suppliers	Industrial and Product Designer	6	4	0	Low
Technical Engineer	Large Component Manufacturer, Component Suppliers, Modular Factory	Industrial and Production Engineer	6	4	0	Low
Technical Engineer	Large Component Manufacturer, Component Suppliers, Modular Factory	Planning Process and Production Technician	6	4	0	Some
Technical Engineer	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Robotics Engineer	8	2	0	Low
Technical Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers	Mechanical Design Engineer	7	3	0	Low
Technical Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers,	Engineering Project Manager	2	8	0	Some

	Modular Factory, Site - Civils MEHVAC Engineers EPC					
Technical Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Quality Control Engineer	8	2	0	Low
Technical Engineer	SMR Prime, Large Component Manufacturer, Modular Factory, Site - Civils MEHVAC Engineers EPC	BIM and CAD Technician	7	3	0	Low
Technical Engineer	SMR Prime, Regulators, Large Component Manufacturer, Component Suppliers, Modular Factory	Nuclear Engineer	8	2	1	Low
Professional Engineer	Site - Civils MEHVAC Engineers EPC	Civil and Structural Engineer	7	3	0	Low
Professional Engineer	Large Component Manufacturer, Component Suppliers, Modular Factory	Production Manager and Director in manufacturing	8	2	0	Low
Professional Engineer	Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Facilities Manager	2	8	0	Some
Professional Engineer	Large Component Manufacturer, Modular Factory	Nuclear Manufacturing Engineer	9	1	0	Low
Professional Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers, Modular Factory	Mechatronic Engineer	8	2	0	Low
Professional Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Cyber Operational Defence Specialist	10	0	0	Low
Professional Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Project Engineer	6	4	0	Some
Professional Engineer	SMR Prime, Large Component Manufacturer, Component Suppliers, Modular Factory, Site - Civils MEHVAC Engineers EPC	Supply Chain Director	9	1	0	Low

4.2 What this means for Industry and the Workforce

Collective Action

Foresighting has been developed to provide insight and the detailed information required to enable action by relevant stakeholders but is the first step of the Skills Value Chain. Collective action will be required by all stakeholders to ensure that the changes identified by foresighting – to the supply chain, the workforce and education provision are implemented.



This section summarises the actions required as a result of this foresight cycle.

Employers in the Nuclear sector should take proactive steps, both individually and collectively, to ensure that the development of skilled professionals meets industry needs. It is essential for employers to embrace upskilling and reskilling initiatives across various sectors, actively fostering a pipeline of future talent from schools, colleges, universities, and transferring people from adjacent sectors for retraining.

As the industry evolves, particularly with advancements in technology, greater technical collaboration among partners will be crucial. This collaboration should commence early in the project lifecycle, including the design phase. We may see an increase in working groups and interface design teams, led by industry leaders, to address the specific needs of emerging roles.

Employers should review the organisational changes that have been identified because of the new technology to start to plan for the changes across their entire supply chain. The insights presented here will be invaluable in strategic planning and coordinated thinking. To effectively tackle the anticipated skills gap, the sector must engage with key stakeholders to develop realistic workforce demand forecasts. This includes collaboration with educational institutions and industry organisations to ensure that training programmes are aligned with current and future job requirements. By taking these coordinated actions, the sector can secure a skilled workforce capable of meeting the demands of rapidly evolving technologies.

4.2 What this means for Education

The findings from the foresighting study indicate that future needs can be addressed through modifications/ additions to some existing courses. The capabilities and potential occupational profiles generated through the foresighting cycle suggest that, in general, modifications/ additions to existing courses are sufficient to meet future needs. A modular approach is more likely to be achievable within the required timescales, compared to wholesale course design. (Although there may be a different approach where educators can come together to develop pathways and efficiencies following an integrated course approach for the sector). Clearly there is a need for Industry and Educators to prioritise the next steps and agree which courses to focus on.

Where there are more specialist technical areas that require capability development, these should be addressed through routes such as specialist Masters/ PhD's through engagement with industry. University-led PhD studies can investigate problems and technologies in detail before professionals in industry and RTOs provide support to refine and scale up solutions. It is important that these types of specialist areas are identified in good time. A challenge for academia is to engage with industry proactively, supporting ongoing dialog so that research topics can be identified collaboratively.

4.3 Recommended next steps

The next phase of the foresighting cycle "Causing Action" will focus on translating insights into tangible outcomes.

- A working group will be convened which will collaborate with stakeholders (Employers and Training Providers – FE/HE) to:
  I. Refine and validate FOPs and capability sets based on industry feedback.
  II. Develop forecasts for component volumes and workforce demand.
  III. Development of selected skills for the sector.

- As we are looking to modify existing courses and/or introduce new courses, it is imperative that organisations such as Skills England (IfATE), RUK and other funding bodies are included, as we walk through the next steps of the workforce Foresighting process.

- Validate FOPs (consider demand / forecast piece)

- Establish an action plan to address short-term and mid-term actions (see below)

- Identify a 'champion' for the development of selected skills for the sector.

- As part of this study, we have suggested 2 further foresighting cycles in the nuclear domain:
  - Giga Watt Nuclear Reactors & Decommissioning
  - Advanced Modular Nuclear Reactors (including Fusion Reactors)

Recommended Actions

To ensure the UK nuclear sector is prepared to meet future demands, particularly in the area of Small Modular Reactors the following actions are recommended:

A/B Review and Dissemination of Findings	Convener and Sponsor to set up working group possibly through GBE-Nuclear (NSDG) to take the findings and recommendation and create an action plan and advance through the Skills Value Chain to cause action. It is essential to share the findings widely among stakeholders, industry groups, and local skills bodies. This will promote access to the insights gained and influence the strategic direction of workforce development initiatives.
C Short-term action	As part of the working group, educators and employers should collaborate to deliver timely short-term training solutions for the current workforce. This is to cause action regarding developing short term training solutions for the future workforce. This includes developing and offering Continuing Professional Development (CPD) courses that address immediate skills gaps and ensure workers are equipped with the necessary competencies.
D Mid-term actions	The ongoing working group mid-term action planning should include a concerted effort to integrate new skills and knowledge into existing training programs. Educators and employers need to update curricula and training standards to reflect the evolving demands of the construction sector, ensuring that both current employees and new entrants are adequately prepared. This may include working with apprenticeship providers, as well as with universities to outline degree changes.
E. General action for Educators to support Employers' demand for future skills	Employers and educators must work together to review and influence the update of IfATE Skills England standards and relevant qualifications. This involves using the insights from the Foresighting process to inform the development of new standards and qualifications that align with future workforce needs.
F Further foresighting subjects	The working group should seek additional sponsors and propose further subjects for Foresighting. This continuous cycle of Foresighting will help to stay ahead of emerging trends and technologies, ensuring the workforce remains adaptable and prepared.
G Lesson Learnt	The Workforce Foresighting Hub should promote the value gained from participation in workshops. Sharing lessons learned will help to refine the Foresighting process and enhance the quality of future outputs

Closing Statement

By addressing these recommended actions, the nuclear sector is significantly more likely to secure a skilled workforce capable of meeting the demands of SMR Manufacture & Construction. These strategies emphasise the importance of coordinated efforts from educators, employers, and stakeholders to bridge the skills gap and support the UK's ambition to lead in the global nuclear economy.

The recommendations in this report emphasise the importance of immediate and coordinated efforts by educators, employers, and other stakeholders to address the growing skills needs by the UK Nuclear industry. The actions are divided into short-term and mid-term strategies to ensure a smooth transition towards the UKs objective to be a global leader in SMR technology.

By undergoing this Workforce Foresighting cycle on SMRs and the results shown in the report, we suggest that doing nothing based on the findings is not an option. New nuclear technologies present a huge opportunity for the UK, both in the UK market and potential export to other countries looking to embrace the SMR programme into their energy infrastructure. The likely size of any future SMR market is likely to be in the billions of pounds, with a future workforce in the region of 150,000 workers (across both civil nuclear and defence). It is now up to the nuclear industry and all relevant stakeholders to take the findings of this report to the next level, working together to bridge the skills gaps to ensure that the right skills are in the right place, at the right time.

5. Appendix

5. Appendices

Section	Title
5.1	Cycle timeline
5.2	Access to output data - link and authorisation
5.3	Glossary - common language
5.4	Visualisation links and illustrations

5.1 Cycle timeline

Workforce Foresighting cycle started the Carry Out phase in February 2025. The Carry Out phase concluded in June 2025. The Findings report was prepared following the data validation period and published in July 2025.

5.2 Access to output data - link and authorisation

Data Capture Overview

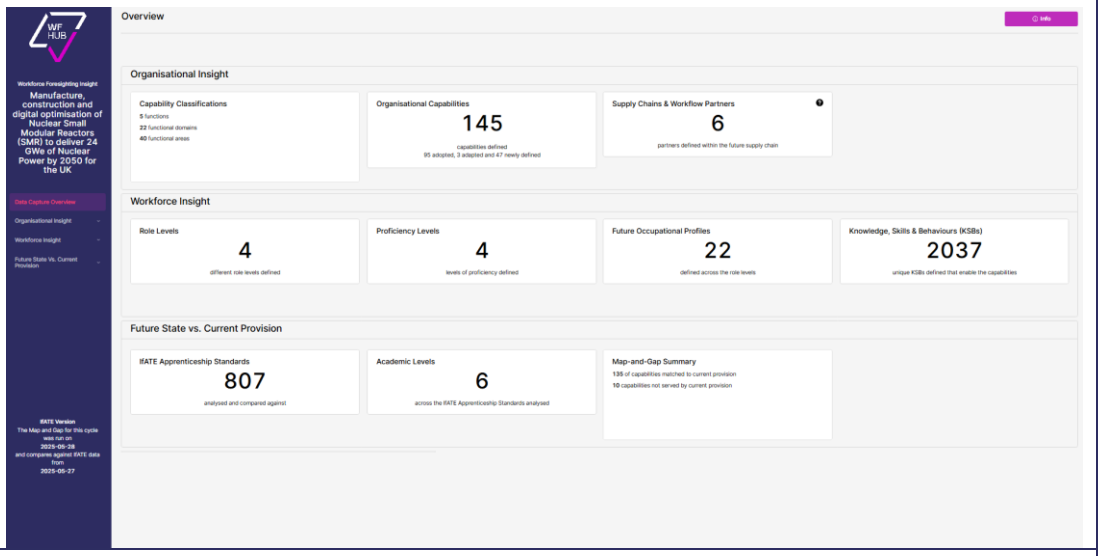
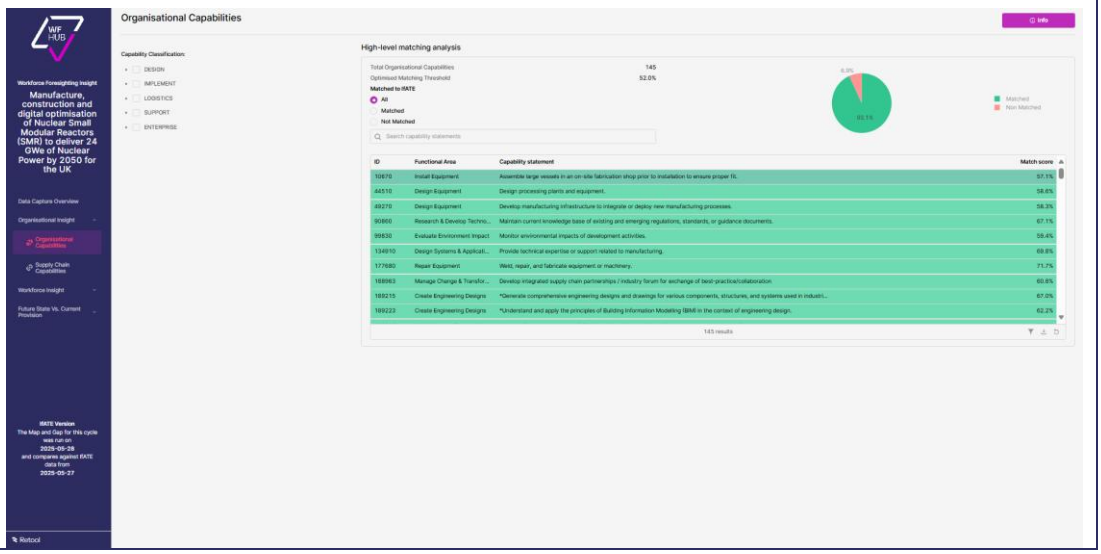
5.3 Glossary - common language

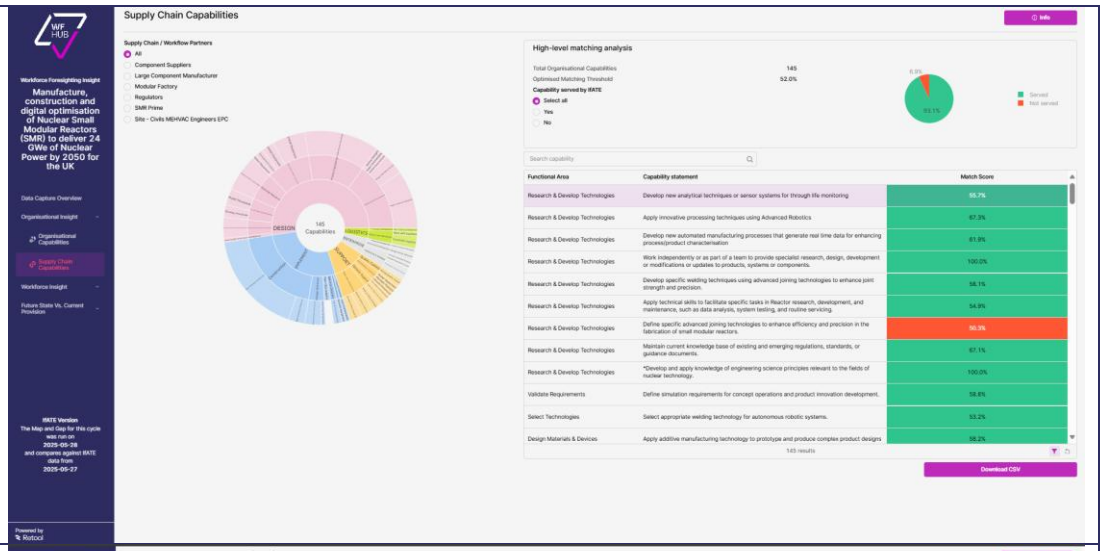
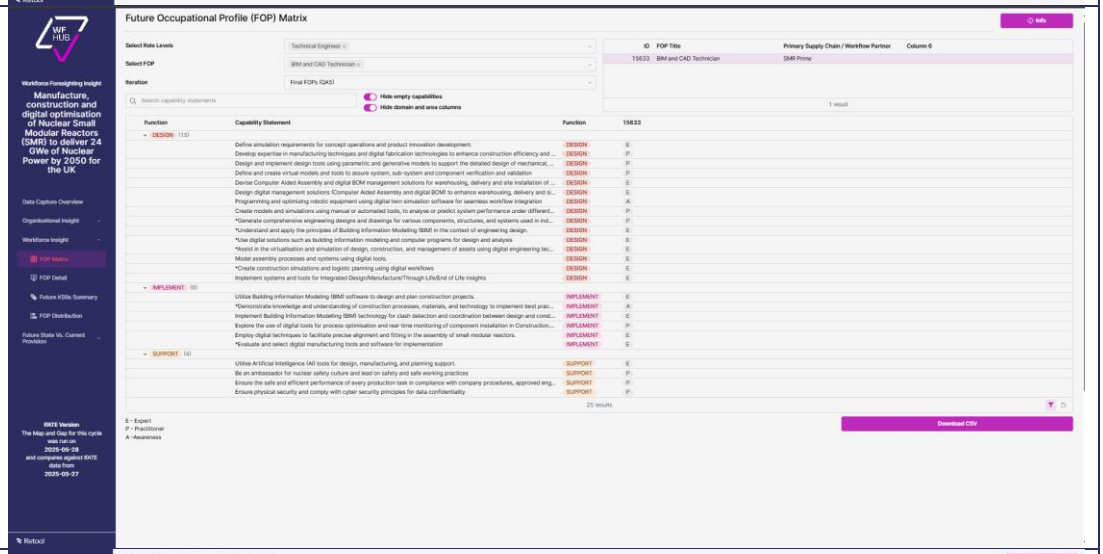
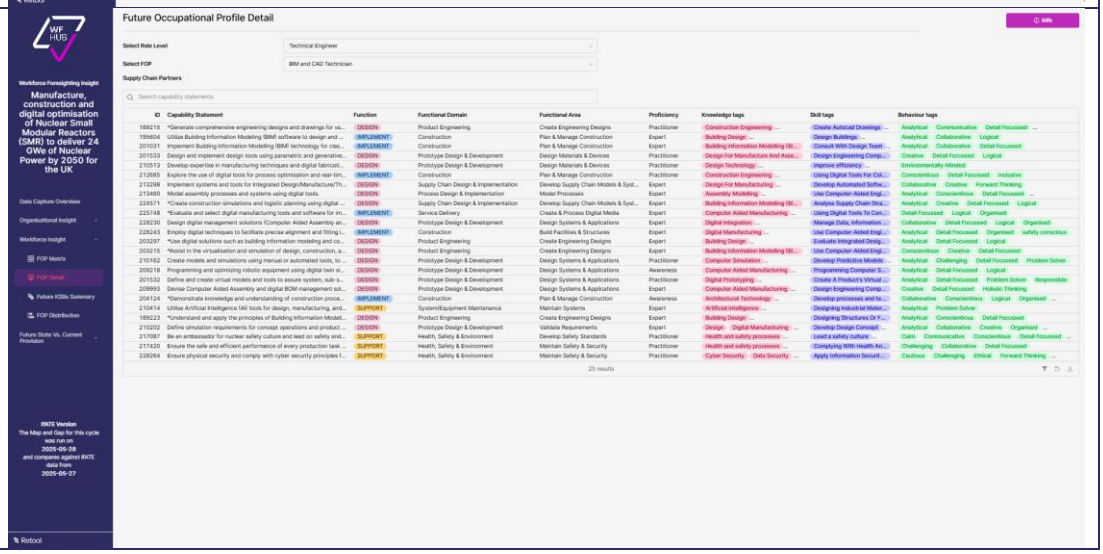
Term	Definition
Capability (Organisation)	The collective abilities, and expertise of an organisation to carry out a function, because provision and preparation have been made by the organisation
Capability Classification	Classification provides a common, structured vocabulary to define capability
Capability Statements	Description of the depth and nature of each capability within an organisation
Capability Syntax	Common language to describe each capability application within organisation type
Challenge Response	Specific intervention aimed at the challenge
Competencies (Workforce / Individual)	'Proficiency, aptitude, capacity, skill, technique, experience, expertise, facility, fitness related to capability
Competency definition 'KSBs' (Knowledge, Skills, and Behaviours)	Knowledge, Skills, and Behaviours are the elements used to express the required competencies for each Role Group
Competency Domain	Used during foresighting analysis to provide focus on existing and emerging competency needs
Delphi Process	Foresighting takes a Delphi approach which has come to represent consulting expert opinion. (Harking back to the Delphic Oracle of ancient Greece)
Foresight Cycle	Set of workshops, analysis and reporting that implements the Foresight Process for each subject
Foresight Process	A series of activities which are convened to understand future competence needs, the opportunities available and actions required to deliver the right skills at the right time and place
Foresighting Champion	An individual nominated within a new user organisation of foresighting to facilitate and lead the use of foresighting processes and tools with the support of the Project Team
Foresighting Subject	The application of specific technologies in the context of a given challenge and which are candidates for foresighting
Future Competency Set	The KBS output from the Educator workshop for each Role Group
HPC	Hinckley Point C
Impact Domains	Innovate UK domains used as Strategic Categories to assist setting and monitoring priorities
Map and Gap Analysis	A combined expert and automated process that maps the Future Competency Set against a selected reference framework
National Challenge (Industry / Sector / Region)	A recognised technological or socio-political threat or opportunity for which there is consensus that workforce action is necessary
Organisation Type	Simple description of nature of organisation for which capability is required
Participants	Technologists, Educators, Employers

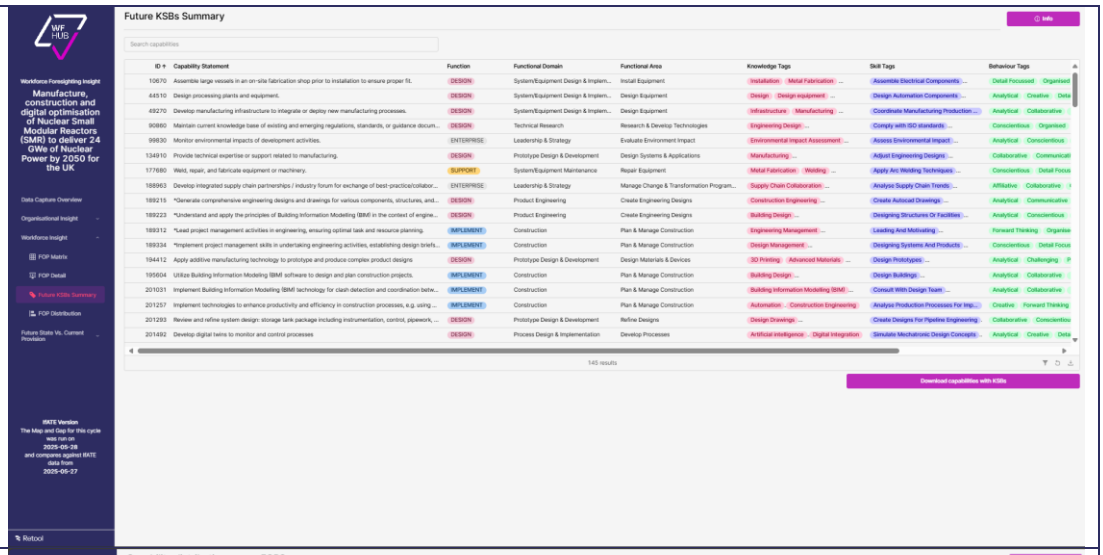
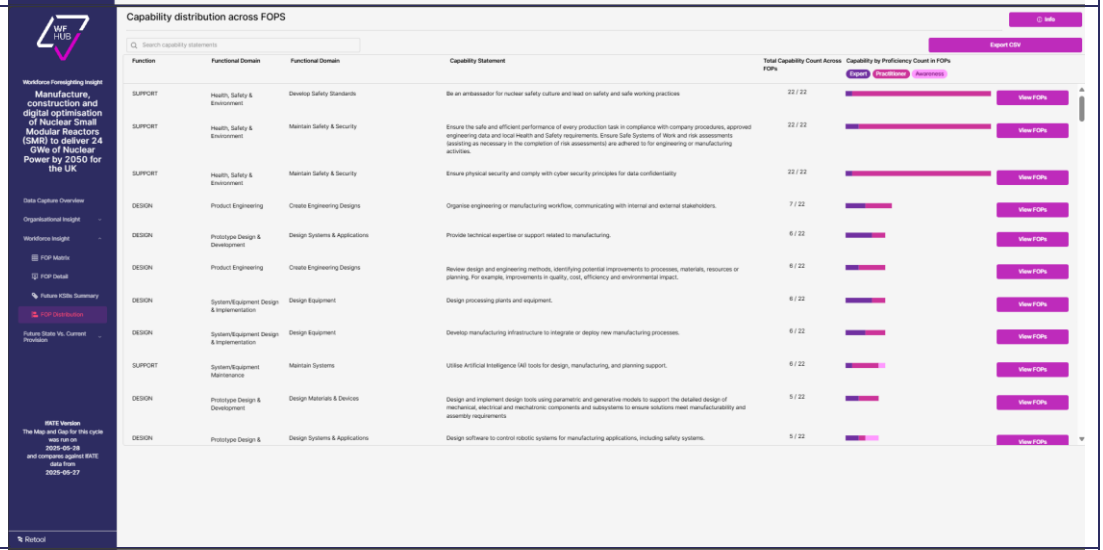
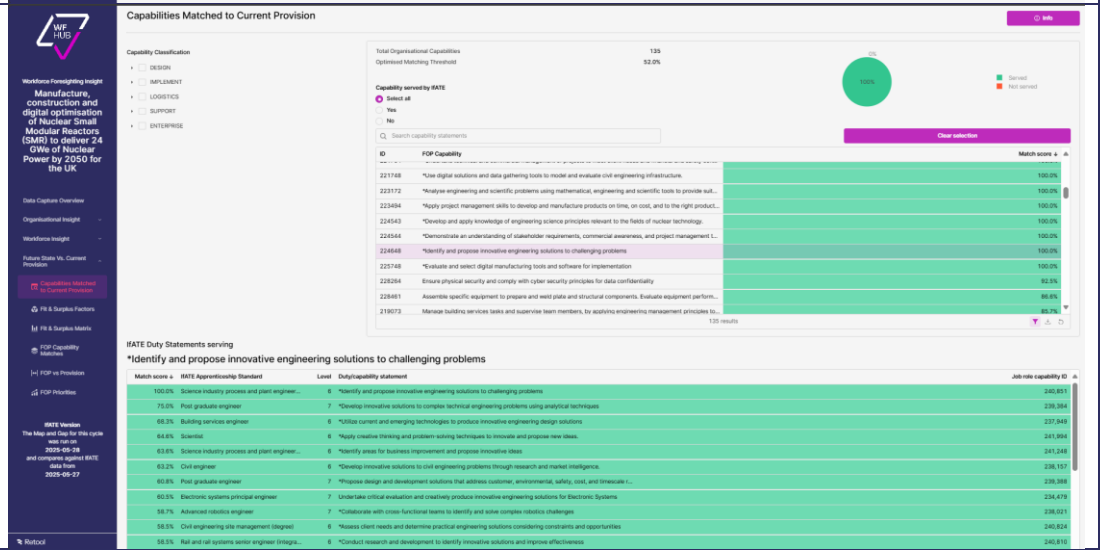
Proficiencies	Proficiencies differentiate the degree of competencies required from differing Role Groups to support capabilities
Project Sponsor	Typically, a stakeholder in the challenge being successfully met who requires information to under-write plans to act
Roadmaps	Sector, Industry, Regional view of emerging opportunities and their market entry
Role Group	Role groups are a collective of roles that exist in a typical manufacturing business / industrial sector
SQEP	Suitably Qualified and Experienced Personnel
Syntax	The way in which a statement is phrased to ensure reliable, repeatable, and meaningful interpretation
SZC	Sizewell C
Technologies	The technology that could be used to address the challenge
Working Scenario	To provide further context in relation to the subjects and used to position participants thinking during the detailed identification of future capabilities
Workshops	Online sessions used to undertake each step in the foresight process

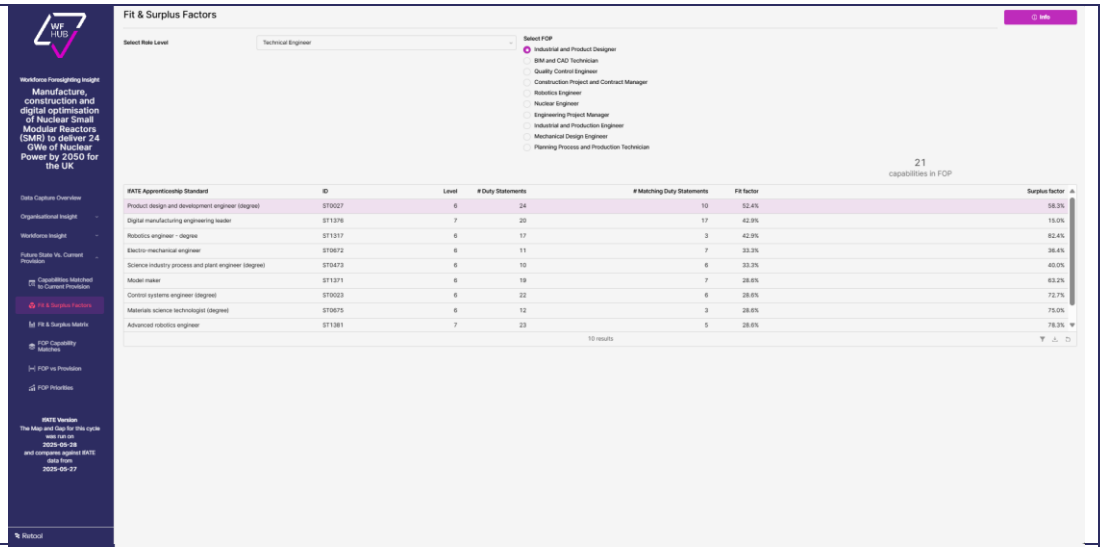
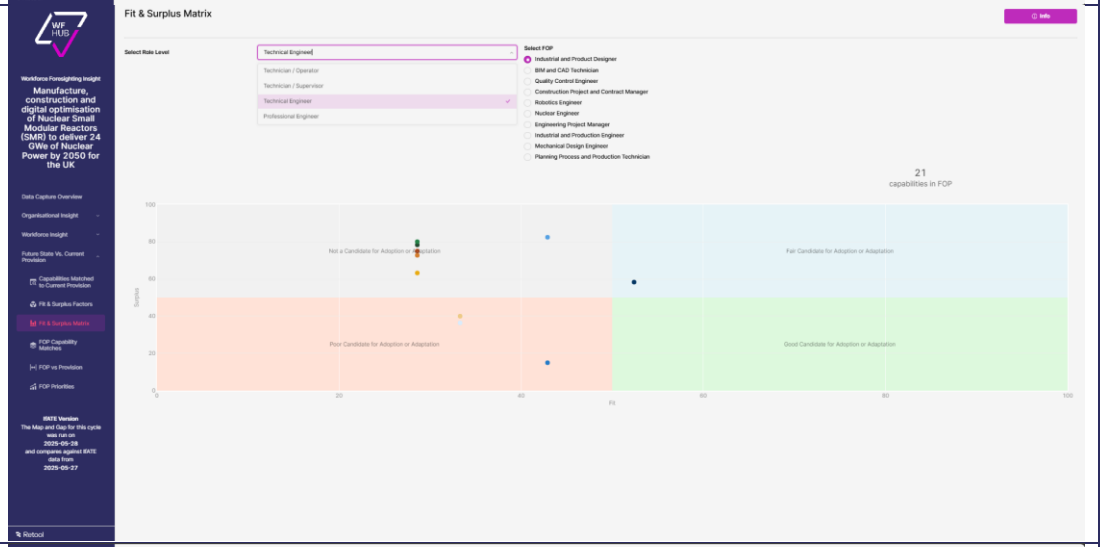
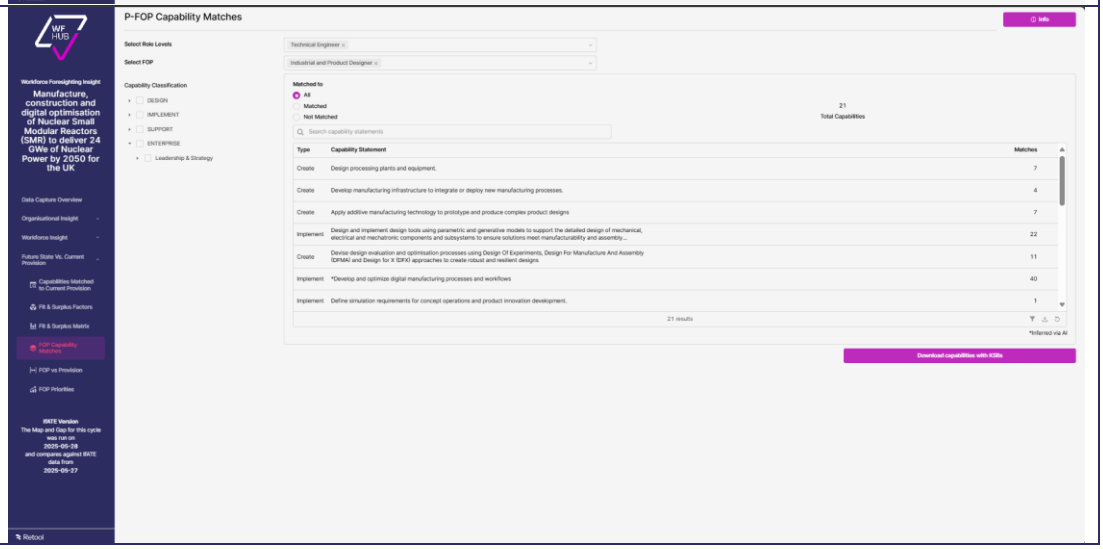
5.4 Visualisation links, illustrations and instructions

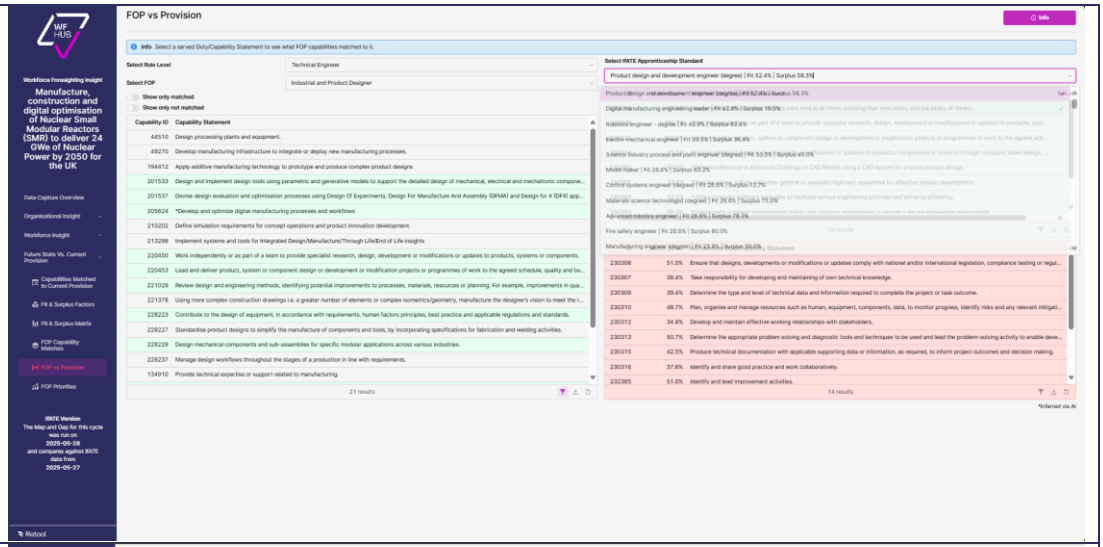
Images are not cycle specific and just for guidance purposes

Link to Visualisation	View of data
Data Capture Overview	
Organisational Capabilities	

[Supply Chain Capabilities]	
[FOP Matrix]	
[FOP Detail]	

[Future KSBs Summary]	
[FOP Distribution]	
[Capabilities Matched to Current Provision]	

Fit & Surplus Factors	
Fit & Surplus Matrix	
FOP Capability Matches	

[FOP vs Provision]	
[FOP Priorities]	

Visualisation Tool Section	What is it and what can it be used for?
Data Capture Overview	Provides a summary of the data captured across the foresight cycle, bringing together the work of the Technologists / Domain Specialists, Employers and Educators into one overview.
Supply Chain Capabilities	Provides an overview of the identified capabilities at a Supply Chain / Workflow Partner level. By selecting/deselecting each Supply Chain / Workflow Partner you can review the capabilities identified as required in that area of the Supply Chain / Workflow. This can be used to generate organisational capability profiles for each area of the workflow /supply chain to help prioritise and focus the acquisition of new capabilities that will be required in the future. It can also be used to generate combined organisational profiles, where an organisation may be involved in more than one area of the supply chain.

Visualisation Tool Section	What is it and what can it be used for?
FOP Detail	This page allows you to review a specific Occupational Profile, including the capabilities contained within it and the Knowledge, Skills & Behaviour (KSB) tags associated with the capability. You can select an individual Role Family and linked FOP in the two available dropdowns. The table in the lower section of the page will then be populated with all relevant capabilities. The search control above the table allows you to filter content of any of the columns of data. A key piece of functionality in this table is the presence of the KSB tags associated with the capabilities.
FOP Matrix	Provides a detailed breakdown of future occupational profiles that could be required in the future workforce. These were generated using a combination of attributes collected through the workshops and an algorithm. These suggested profiles were then reviewed and ratified by small groups of employers who were able to add/remove capabilities and uprate/downrate proficiency levels required. You can view all the FOPs in a role family by selecting one (or more) of these from the drop down. This will then allow you to select the FOPs aligned to that role family. The populated table allows you review and compare different FOPs within or across role families. You can view the capabilities in each FOP and the assigned proficiency levels. You can also toggle 'Hide Empty Capabilities' on/off to reduce the view down to only those capabilities included in the role family you are reviewing.
Future KSBs Summary	Not yet completed in this cycle. Provides a view of the complete set of capabilities within the cycle along with all of the associated KSB tags which are linked to them. It is, essentially, the superset of all details displayed on the FOP detail page. This is used to: • To review the identified Knowledge, Skill and Behaviour tags for a given capability, to support development of future education and learning material. • To review the requirements from a capability level, rather than a role family/occupational profile grouping.
FOP Distribution	This page allows provides a breakdown of the Capabilities within the selected Cycle and how they are distributed across the FOPs with the addition of a distribution chart showing the required proficiency across those FOPs. Clicking the "View FOPs" button alongside each capability will provide a list of the proficiencies (EPA) with the FOPs that fall into them. The exported version of this data will include a full breakdown of the FOP IDs which contain the capability within a specific proficiency. This is used to: • understand the levels/volumes of common/crossover Capabilities, to support prioritisation of Capability Development • identify which Occupational Profiles contain these common/crossover capabilities, and so which may be prioritised for development activity

Visualisation Tool Section	What is it and what can it be used for?
Capabilities Matched to Current Provision	This page allows you to review and compare individual capabilities against 'Duty' statements in an Apprenticeship / Occupational Standard. You can select individual capabilities to review their specific matches. These matches are shown in the bottom panel, including the Standard, the Level and the Duty Statement this is matched to. You can filter in several ways to focus your review: • By the Capability Classification Framework (left-hand panel). • By capabilities that **are** served by the reference mapping framework – the default is Institute for Apprenticeships and Technical Education (IfATE) provision. By capabilities that **are not** served by the reference mapping framework, e.g., IfATE provision – these are capabilities required in the future that may require new/bespoke training and CPD materials to be developed to upskill/re-skill the workforce. This page can be used to identify where existing provision may exist across the broad spectrum of Occupational Standards, and not just within a narrow range of sector-specific Standards. The data also allows you to identify where provision may already exist to support specific capabilities.
Fit & Surplus Factors	This page allows you to review the 'Fit' and 'Surplus' of Prototype Future Occupation Profiles (FOP) against existing training provision e.g. Institute for Apprenticeships and Technical Education (IfATE). It is possible for the 'Fit' and 'Surplus' comparison to total over 100%, as they are two separate calculations based on a two-way comparison.
Fit & Surplus Matrix	This page is a visual representation of the 'Fit and Surplus Factor' insight. You can visually review 'Fit' and 'Surplus' of Future Occupation Profiles (FOP) against existing training provision e.g. Institute for Apprenticeships and Technical Education (IfATE). This can help you identify which provision may align strongest, or which may require adaptation, to provide the suitable provision fit for each future role. It will help you focus in on which provision to focus your attention for analysis.
FOP Capability Matches	This page allows you to view the matches between Capabilities and Institute for Apprenticeships and Technical Education (IfATE) Duty Statements. Clicking the arrow next to a number in the 'Matches' column will open a popup with more detail for each Capability. Each capability also includes Knowledge, Skill and Behaviour Tags, to support with scaffolding future education provision. You can review individual Future Occupational Profiles (FOPS) or review all FOPs under a Role Family, to give a more holistic view of Capabilities and Matches Where a future capability has been matched to existing provision (currently, by default, IfATE apprenticeship standards) it is possible to interrogate the data and identify specific statements in standards that align to enable identification of existing training materials and activities that could be used or adapted to meet future requirements. This can be used to review the capability requirements for Role Families and FOPs, from Job / Occupation level through to Knowledge, Skill and Behaviour level

Visualisation Tool Section	What is it and what can it be used for?
FOP vs Provision	This page allows you to compare FOPs against existing IfATE Standards. The information here allows you to prioritise effort or action over the short, medium or long-term. This is displayed as a Matched/Not Matched Capability, comparing the Capability in a FOP to the Duties in a Standard. The left-hand side allows you to select the Role Family and FOP, while the right-hand modal allows you to compare against the top 10 matched IfATE Standards for that Occupational Profile. Where a future capability has been matched to existing provision (currently, by default, IfATE apprenticeship standards) it is possible to interrogate the data and identify specific statements in standards that align to enable identification of existing training materials and activities that could be used or adapted to meet future requirements.
FOP Priorities	Provides a list of all the FOPs within the selected cycle with details of their fit and surplus factors. The information here allows you to prioritise effort or action over the short, medium or long-term.