

**Workforce Renewal and Skills Strategy:
Workforce resilience workstream**

Water industry skills deep dive - Abridged Version

February 2024



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1 Executive summary

- 1.1.1 The water industry faces the twin challenges of achieving net zero operational emissions by 2030¹ and fulfilling the requirements of the Environment Improvement Plan (EIP) 2023². This takes place against a backdrop of more frequent extreme weather events, increasing overall demand for water from a growing population and heightened concerns around environmental impact.
- 1.1.2 New infrastructure and technologies will be key to enabling the necessary transformation, in addition to the ageing infrastructure in need of replacement and repair. Energy & Utility Skills has been, and continues to be, a strong advocate for the water industry in collaborative cross-sector policy development to leverage the opportunities for “green jobs”.
- 1.1.3 Meanwhile, pre-existing skills and workforce challenges have not simply disappeared – far from it. As the industry prepares for substantial growth and change with £96 billion of investment planned for PR24, the workforce is ageing and competition for vital skills from other sectors is becoming more intense. For example, a lack of capacity is hindering wastewater management, resource recovery and reuse. This report notes a lack of technical expertise to operate and maintain wastewater treatment plants with resource recovery, or in implementing reuse practices³.
- 1.1.4 Successful strategies to widen the resourcing net and successfully attract candidates from all communities and backgrounds will be essential to securing the required capacity and capability. In addition, and as a short-term only measure, this report recommends that employers consider whether to campaign for additional occupations to be added to the Shortage Occupation List which is due to be reviewed in Spring 2024.

¹ As stated in Water UK's Net Zero 2030 Routemap (2020)

² The first revision of the 25 Year Environment Plan published by DEFRA in 2018

³ Wastewater: Turning problem into solution, United Nations Environment Programme, 2023

- 1.1.5 Concurrently, entry routes must be clear, coherent and fit for purpose. There is no specific T-Level (available or in development) for the water industry. Although there is a wide range of Skills Bootcamps available across England which provide useful pre-employment/apprenticeship learning, there are gaps in the available offer, particularly around nature-based solutions and specific technologies used to decarbonise the industry, such as anaerobic digestion.
- 1.1.6 Consistent skills delivery across the four nations of the UK will be key to enabling collaboration. For example, all starts on apprenticeship programmes in England are now on employer-led Apprenticeship Standards, whereas in Scotland, Wales and Northern Ireland, the older, qualification-based Apprenticeship Frameworks are preferred. Meanwhile, “Skills bootcamps” are only available in England. This can lead to disparities in the content of training and differences in the funding available. Through coordinated strategic engagement with stakeholders in the devolved nations, employers must seek coherence in industry-informed policy approaches and skills delivery.
- 1.1.7 A concerted effort in employer network groups and engagement with wider stakeholders is needed to determine how an industry-driven alternative programme or modular offering for the 16-18 age group could interface with existing pathways to competence.
- 1.1.8 Considerable scope exists to secure economies of scale in the development and purchase of training solutions that meet a widespread need to an industry-agreed standard. For example, in response to the need for pre-employment induction resources or utility-specific units of learning for new AI, data and digital recruits, there is an opportunity for employers to collaborate on design and delivery of an industry standard, cost effective solution. The same opportunity exists within specialist areas, such as up-skilling support within nature-based solutions and green power technologies.
- 1.1.9 Finally, as new systems and approaches become embedded, this research has revealed that many employers do not have access to standardised, industry validated person specifications, competence requirements or assessment approaches. This has been particularly apparent in roles and specialisms relating to nature-based solutions and the Circular Economy, but also applies to AI and data functions. The water industry is, therefore, encouraged to come together as a collective to address this through a proposed “occupational mapping” exercise to be undertaken by Energy & Utility Skills during 2024.

7 Recommendations

7.0.1 Based on the research presented above, a number of recommendations and next steps are proposed for consideration by the Water Industry Strategy Group.

7.1 Cross-industry opportunities

- 7.1.1 In many areas covered by the report, water companies are seeking to address the same skills challenges. Through developing a collective understanding of the scale of specific training requirements, there is likely to be substantial potential to benefit from economies of scale when it comes to developing and purchasing training solutions.
- 7.1.2 In response to the industry-wide need for pre-start/induction training, there is also an opportunity for employers to collaborate on design and delivery of an industry standard, cost effective solution. New arrivals, including apprentices, call centre staff etc., need to be equipped with basic employability skills required for the workplace, such as awareness of MS Office, basic personal finance and meeting etiquette.
- 7.1.3 The importance of employers providing work placements and practical experiences while studying is well evidenced and should be promoted across the industry⁶⁶.
- 7.1.4 Employers in the water industry should commit to achieving 5% of their workforce being on an apprenticeship. This is likely to be more of a challenge for supply chain partners (data from the Procurement Skills Accord for 2022/23 shows that while 4.8% of the workforce were Apprentices, there was a difference between asset owners/tier 1 (5.0%) compared to tier 2s (3.3%).

7.1.5 Only 0.5% of graduates find employment in the water industry 15 months after completing their studies (130 out of 23,880 who were in employment). More work needs to be done to understand why this is the case. Is it due to a lack of supply (employers would recruit more graduates if they were available) or because of a lack of demand (more graduates would enter the water industry if vacancies were available)?

7.1.6 The water industry should fully engage with a proposed occupational mapping exercise that Energy & Utility Skills are proposed to undertake during 2024. This exercise will likely consist of a detailed analysis of the tasks undertaken by critical job roles within the industry, and how various routes to competency can be used to achieve competency. Such an occupational map could be useful in a variety of ways, including:

- Where job roles are developing/changing, or new job roles are being developed, this map will enable industry to develop the ideal job role, person specification and competency requirements in a collaborative manner⁶⁷
- The development of an industry standard approach to assessing the competence of an individual
- The development of water industry career progression routes and learning pathways, which can be used in promoting the industry to a variety of different audiences (e.g. school pupils, new labour market entrants, career transitioners, etc.)

⁶⁶ Such an approach might consist of a short (two-week) Summer University programme, consisting of a number of expert lectures by employees and external specialists, tours of sites, etc across asset owners and their supply chain.

⁶⁷ This may require appropriate technical standards to be developed first, particularly in relation to nature-based solutions.

- 7.1.7 Although there are a wide range of Skills Bootcamps available across England which provide useful pre-employment/ apprenticeship learning, there are gaps in the available offer, particularly around nature-based solution and specific technologies used to decarbonise the industry (e.g. anaerobic digestion). The availability this short-course, introductory provision should also be made consistent across the four nations of the UK.
- 7.1.8 As “carbon accounting” is increasingly becoming a business-as-usual activity, and there are numerous generic course available, the water industry may wish to consider developing a short course delivering carbon accounting skills within the context of the water industry.
- 7.1.9 Employers should consider when it might be appropriate to utilise the UK’s various immigration routes to help alleviate short-term skills shortages, including:
- the Skilled Worker Route^{68, 69}
 - Shortage Occupation List⁷⁰
 - Graduate Visa Route⁷¹
 - Global Business Mobility Routes⁷².

- 7.1.10 It is likely, if the Government accepts the MAC’s most recent recommendations, that the only occupation on the SOL which is relevant to the water industry is Laboratory technician (related job titles include Laboratory analyst, Laboratory technician, Scientific technician and Water tester). Furthermore, there would be a requirement for applicants to have at least three years’ full-time experience.
- 7.1.11 Water industry employers should consider whether it might be appropriate to lobby the MAC for additional occupations to be added to the SOL when it is reviewed in the Spring of 2024.

7.2 Nature-based solutions

- 7.2.1 Companies could consider combining their resources to create more diversity of pathways into NBS specialisms – and to create the required aggregate demand to make such provision economically viable for training providers. For example:
- Virtual modular upskilling provision in Applied Mathematics, Chemistry and Hydro-Geology to support individuals to progress to a more specialist roles within the industry, as well as new entrants from other sectors.
 - For individuals wishing to progress from the water quality laboratories into a different or more specialised role, such as process science, some upskilling is generally required around applied Mathematics, Chemistry and Geology in a water industry context. The lack of training courses and resources focusing on how these subjects can be applied to real-life scenarios that NBS and catchment management teams is a significant gap in existing provision.
 - Knowledge and understanding of project planning approaches, including recognising social value, finance and risk management

68 [Skilled Worker visa](#)

69 [Skilled Worker visa: eligible occupations and codes](#)

70 [Skilled Worker visa: shortage occupations](#)

71 [Graduate visa](#)

72 [Immigration Rules](#)

- 7.2.2 Employers may wish to consider scope for regional or localised collaboration so that a range of stakeholders can benefit from targeted upskilling and shared, modular online training resources. This could include developing training materials and information on best practice that could be accessed virtually on key areas of NBS-related knowledge and skills. (The ‘Community of Practice’ between the Rivers Trust, Northumbrian Water and Severn Trent could provide a useful model for this.)
- 7.2.3 There is a need for accessible industry-wide modular training on very specific areas, such as Control of ‘Invasive Non-Native Species’ (INNS) and Biodiversity – likely accessed online.

7.3 Net zero and bioresources

- 7.3.1 Skills solutions are likely to focus on:
- Upskilling of the existing workforce will be required – mostly in a short-course, unaccredited format. This, therefore, provides an opportunity to develop industry-standard modules which could streamline and standardise the learning required to operate and monitor a range of green technologies on water assets.
 - Industry-standard conversion training of workers from other industries where CHP, onshore wind and solar PV are already in play and how fit within the context of water industry assets.
 - “Carbon accounting” – a short course delivering carbon accounting skills within the context of the water industry.

7.4 Artificial intelligence, data and digital

- 7.4.1 A significant paradigm shift is required within water industry in terms of mindset and processes to embrace collaboration, to educate employees on digital transformation initiatives, and to ensure the commitment and ownership for digital transformation moves from senior to middle management to the operational workforce.
- 7.4.2 In addition to formal routes such as apprenticeships, T Levels and higher education, The Royal Society⁷³ suggests the following mechanisms to develop foundational data science knowledge and skills at an earlier age:
- Integration of data skills into the school curriculum
 - Outreach programmes, to ensure that opportunities are available to all sections of the community
- 7.4.3 The water industry should consider whether there is any merit in developing industry-standard learning modules for new AI, data and digital recruits which can quickly give them the industry context to their skills. For example, the Utility Analytics Institute in the USA delivers a “Utility Analytics 101” course⁷⁴ aimed at, amongst other people, data analysts new to utilities and utility professionals new to data analytics.

⁷³ [Dynamics of Data Science Skills: How can all sectors benefit from data science talent? The Royal Society, 2019.](#)

⁷⁴ [Utility Analytics 101](#)

7.4.4 In order to attract and retain talent into the water industry, consideration should be given to how this valuable part of the workforce can be celebrated. For example, in the US, the Utilities Analytics Institute holds annual awards in areas such as⁷⁵:

- Best Innovative Utility Analytics Team
- Best Utility Analytics Leader
- Best Utility Analytics Professional
- Analytics Ambassador
- Community Engagement
- Top 25 Thought Leaders in Utility Analytics

7.4.5 Water companies should consider taking the advice of The Royal Society⁷⁶ which suggests that there is value in companies allowing their data scientists to donate their time to applying their skills to societal challenges. For example, through pro bono project work along the lines of DataKind UK⁷⁷, the Royal Statistical Society's Statisticians for Society programme⁷⁸, and hackathon events. The possibility of data specialists from across the water industry joining forces to collaborate on a common project should be considered.

75 [2023 UAI Excellence Awards Nominations: Unleash the Power of Recognition](#)

76 [Dynamics of data science skills, The Royal Society, May 2019.](#)

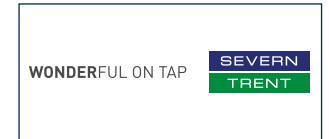
77 [We help the third sector tackle its challenges using data](#)

78 [Statisticians for Society](#)

Annex 1 – List of contributors

We would like to thank all supporters of this research and the subject matter experts who have contributed to it:

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Data sources and employer representation

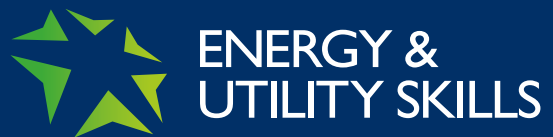
This research report is based on information drawn from a range of external sources, including online journals, websites and data providers, such as Lightcast. Lightcast is a platform which offers big-data analysis of job postings, gathering data from more than 65,000 sources daily, including job boards and company websites. Apprenticeship data has been obtained from funding bodies across the four UK nations. Qualitative data has also been obtained via interviews with representatives from stakeholder organisations, including asset owners, service providers and consultants to the water industry. Support and contributions from stakeholder organisations have been acknowledged at the back of this report, without directly attributing any statements or points of view to any individual or their employer.

Next steps

Following conclusion of this research, Energy & Utility Skills will convene a dedicated Water Strategy Group to allow employers to collaborate on issues specifically affecting the water industry. This group will consider how to progress the report recommendations and initial focus areas may include participation in a pilot 'occupational mapping' exercise to provide a clear picture of career paths and skill requirements for different roles. Energy & Utility Skills will proactively engage with other key stakeholders, including representative bodies, to develop a coherent water industry action plan on future skills.

Full report available to Members of Energy & Utility Skills

Contact research@euskills.co.uk for more information



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