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Network Relevant Students Research

Research report

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Contents

Introduction 5
Overview 5
Aims and objectives 6
Audience focus: Defining Network Relevant Students 6
Methodology 8
Phase 1: Desk research and profile building 8
Phase 2: Primary research 9
Qualitative research 9
Quantitative research 9
Stakeholder engagement 10
A note on interpretation and data limitations 10
Understanding the wider context 12
Current workforce 12
Addressing workforce challenges 13
Meeting future workforce needs 13
A gender imbalance remains 16
Major competition within and across sectors 17
An outdated view of the roles needed 18
Skills challenges remain 19
Limited ability for industry to incentivise 20
MAIN FINDINGS 22
Network relevant qualification routes 22
Higher education 22
Apprenticeships 22
Vocational and Technical qualifications 23
Building a profile of 'NRS' 24
NRS study numbers and changes over time 24
NRS demographic profile 25
Understanding educational and career path choices of NRS 26
Higher education vs vocational routes 27

Degree route 27
Vocational route 27
School influence 27
Subject choice 28
Barriers and motivators behind career choices of NRS 29
Overall motivators: survey findings 29
Seeing people like ‘me’ 31
Opportunities to work in a green job 33
Employer and sector reputation 34
Pay and benefits 35
Family and community influences 36
Location 37
Job security 38
Career progression and skills development 39
Poor sector awareness 39
Other barriers to entry 41
NRS survey segmentation 42
Conclusions and recommendations: Future targeting of NRS 44
Key reflections 44
Recommendations 45

Introduction

Overview

A sufficient pipeline of skilled workers in network roles and the associated supply chain will be critical to meeting the UK's Clean Power 2030 and Net Zero commitments[1][2]. However the current workforce faces a number of challenges. This includes a need to grow and reskill the sector in the face of stiff competition across industry, and to attract a more diverse workforce.

A critical route to maintaining and growing the workforce is through recruiting early career students with the relevant qualifications to working in the electricity networks sector – a group referred to throughout this report as 'Network Relevant Students' (NRS).

Accordingly, this research has been commissioned to grow the evidence base around current barriers and motivations (perceived or actual) amongst NRS to working in network roles, how these manifest across different groups of NRS (e.g. according to gender or other demographic factors), and how NRS could be effectively encouraged to join the future workforce.

The research is specifically targeted at those studying, and who have recently completed studying, STEM degrees (e.g. engineering) and vocational courses via non-graduate routes (colleges or apprenticeships), which provide the prerequisites to taking up key roles in electricity networks.

Findings are designed to inform future interventions that industry, Government and others could take to help encourage NRS to consider a career in the sector.

The research aims to account for the Transmission Acceleration Action Plan (TAAP) recommendations, which include actions to raise awareness for the need for new electricity infrastructure and the job opportunities arising from this, as well as the actions required to attract, recruit, and retain the workforce needed to deliver Net Zero.[3] It also aims to support commitments in the Clean Power 2030 Action Plan to explore public awareness campaign options. This includes working with industry to coordinate messaging promoting the

[1] UK Government (2021). Net Zero Strategy: Build Back Greener. Department for Energy Security & Net Zero (DESNZ) (2024). Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex.
[2] The UK's electricity network includes all stages of electricity generation, transmission, and distribution, connecting power stations and generators such as windfarms to domestic and industrial users. This includes the nationwide system of pylons and cabling connecting everything together. Job roles in the sector include engineering, construction, planning and logistics roles, among others
[3] Department for Energy Security & Net Zero (DESNZ) (2023). *Transmission Acceleration Action Plan Government response to the Electricity Networks Commissioner's report on accelerating electricity transmission network build*.

opportunities from clean energy jobs, help employees and employers navigate the skills landscape, and improve diversity in the clean energy workforce.[4]

Aims and objectives

The aims of the research were as follows:

- Develop a typology or profile of NRS and establish existing statistics relating to them.
- To understand what career paths NRS are considering, and the drivers/motivations behind these.
- To explore NRS' awareness of the jobs or careers available to them in networks and other green sectors.
- To explore NRS' perceptions towards working in network relevant roles, and other green sectors.
- To understand to what extent the demographics and backgrounds of NRS affect their likelihood of considering networks careers and how the networks sector can attract a diverse workforce.
- To understand network employers' and other stakeholders' views and experiences of training, recruiting and retaining NRS.
- To understand what additional information (e.g. communications campaigns and jobs information hubs) on network jobs could help increase the number of NRS considering careers in the sector.
- To understand what other interventions could help increase the number of NRS considering careers in the networks sector.

Audience focus: Defining Network Relevant Students

The target audience for this project was defined by DESNZ as those who are currently studying for, or who have recently completed, STEM-related qualifications, which would likely qualify them for various job roles in the electricity networks sector (including those who have gone into networks and non-networks roles). This study population is referred to as 'Networks Relevant Students' (NRS).

This audience focus has been deliberately 'downstream', as opposed to a focus on earlier stages in an individual's education journey, though this report aims to capture broader learnings where relevant. It has incorporated both academic and vocational qualification routes

[4] Department for Energy Security & Net Zero (2024a). *Clean Power 2030 Action Plan: A new era of clean electricity*.

to better represent the range of skills and training needed to support the future networks workforce.

Lists of eligible NRS qualifications were drawn up by The Social Agency, in collaboration with DESNZ, discussions with stakeholders and based on available data for university and vocational routes.[5] Most of the restrictions imposed around participant eligibility were based on the definition of 'network relevant' qualifications themselves. The only other eligibility criteria were qualifications needed to have been completed in the UK; and qualifications to be either yet to be awarded or awarded within the last 5 years. No criteria were imposed in terms of age, gender, region, or nationality.

Further details on how this audience has been defined can be found in Appendix 1.

[5] GOV.UK (n.d.b). *Skills Bootcamps, Skills for Careers*; GOV.UK (n.d.a). *Apprenticeships, Academic year 2023/24*.

Methodology

The methodology took a deliberately iterative approach, ensuring learnings from each phase fed into the next, and that the focus of the primary research phase built on the existing research and evidence base. Our two-phased approach is summarised below, with further details about the methodology and sampled population (audience engagement) provided in Appendix 2.

Phase 1: Desk research and profile building

This initial phase aimed to draw on publicly available evidence, together with insights from key stakeholders, to develop a 'typology' which profiled the nature and prevalence of different NRS. This work also aimed to add to our understanding of the key challenges facing the sector. Specifically, this phase sought to understand:

- current network sector roles, and those which will be needed in the future;
- the demographic make-up of those currently working in network roles (and relative to other sectors);
- the relevant qualifications that would enable NRS to take up network roles and which educational institutions offer these;
- how many NRS are studying in the UK currently (including the nature of the subject and qualification route, and extent to which we see completions and drop-outs), and how this has changed over time;
- the relevant entry routes and what these look like for NRS;
- the demographic make-up of NRS, and how it differs by route; and,
- how network roles are currently promoted to NRS, and what current strategies are in place to attract them.

For the stakeholder interviews, a number of categories were agreed with DESNZ to ensure insights were brought in from all relevant parts of the sector (including Government, academia, policy, education and industry). A total of 20 stakeholders across 19 organisations were interviewed between 24 July and 5 September 2024.

A list of specific research questions and a research strategy were agreed with DESNZ, with individual sources identified using a combination of building on an existing literature review conducted by DESNZ, strategic searches of databases and key organisations' repositories, and signposting of relevant material by stakeholders. A list of over 90 sources was identified, which were then reviewed and ranked in terms of relevance, with the most relevant then analysed. Secondary analysis was also conducted on existing data from HESA and published Government statistics.

Phase 2: Primary research

Building on learnings from Phase 1, primary research was then conducted directly with NRS to further understand the barriers and motivators of taking up a role in the electricity networks sector, and how this varies according to demographics and qualification routes.

This approach used both qualitative and quantitative methods to allow for an in-depth understanding of the barriers and motivators that exist, whilst measuring prevalence around attitudes and behaviours as they relate to engagement with network relevant roles.

Qualitative research

This consisted of 8 x 90-minute online focus groups with current NRS (engaging a total of 50 individuals) and 20 x individual 45-minute online interviews with recent NRS. Interviews were more appropriate than group discussions for recent NRS since they enabled better exploration of individual qualification and career journeys. Recruitment was conducted ‘free find’ using a professional recruitment partner, Criteria. Participants were offered incentives in the form of a BACs transfer payment to encourage participation, in line with GSR ethical standards. Topic guides and supporting stimulus materials were developed to ensure suitable coverage of the questions. These were designed in consultation with DESNZ.

Quantitative research

A c.15-minute online survey was also conducted with 303 current and recent NRS. With this audience there was no single defined sample frame from which to design the survey. As such, it required the use of a multi-pronged sample approach, drawing on a combination of online consumer panel sample and an open survey link promoted and distributed to NRS via a range of academic and vocational organisations (See Appendix 2). A questionnaire was designed in consultation with DESNZ, which was then tested via 6 cognitive interviews with NRS to ensure language was clear and questions relevant, including the nature of the barriers and motivators asked about (see Appendix 3).

The survey ran from 13 November to 23 December 2024.

Through these methods we explored:

- key motivating factors in qualification and career decision-making;
- current awareness and understanding of the networks sector;
- appetite for working in the networks sector, and,
- among those already in work, the personal journeys that got them onto their respective career routes, decision-making when choosing jobs, and why they chose their current role.

‘Key Drivers’ analysis was then conducted on the survey data to identify the relationship between career motivation factors and the extent to which NRS would consider a job in the electricity networks sector. A segmentation analysis followed, using Factor Analysis and

Hierarchical Cluster Analysis, and then decisions trees using CHAID. This aimed to identify key ‘segments’ of NRS to support more effective targeting of interventions.

Stakeholder engagement

Following the completion of the main phases of research, a stakeholder workshop was held on 12 February 2025, at which the key findings from the primary research were presented and implications around interventions discussed. Discussions focused in particular on possible messaging and awareness raising interventions to encourage NRS engagement with network opportunities (in line with Government commitments in the Clean Power 2030 Action Plan). In total, 17 stakeholders from across Government, academia, policy, education and industry attended the workshop (some of whom had also taken part in a Phase 1 interview).

A note on interpretation and data limitations

This project sought to estimate the number of NRS currently in the UK and build up a demographic profile of this group using existing published data. This was ultimately limited by the disparities in data available for different qualification types, with significantly more data available for higher education routes (i.e. university degrees) than for apprenticeships or other vocational qualifications.

Where possible, exact figures have been sourced and quoted in the report, but significant evidence gaps remain, particularly in terms of the profile of those on vocational routes, and the proportion of NRS (and the networks workforce) which they represent. This lack of publicly available data has made it challenging to develop a robust ‘typology’ which profiles the nature and prevalence of different NRS. However, information gleaned still offers useful insights into the nature of this audience, with relevant findings detailed in this report. Where detailed, the research draws on the latest publicly available data at the time of analysis and which supports the profiling and estimates required. Thus, dates may differ for the varying estimates presented (for example, for higher education versus apprenticeship data).

Qualitative research (i.e. interviews and focus groups) is illustrative, detailed and exploratory. It is designed to offer insights into the perceptions, feelings and behaviours of people rather than quantifiable conclusions from a statistically representative sample.

In contrast, quantitative research (i.e. the survey) allows us to understand views of a wider population - in this case, about NRS attitudes and behaviours to pursuing network relevant roles. It can also help to validate findings from qualitative research. Please note that the open and self-selecting nature of the NRS survey means it is not possible to speak to a ‘representative’ sample of NRS, nor extrapolate this to the wider NRS population. In addition, there is no publicly available population ‘profile’ data for NRS against which to weight data as a way to counter non-response bias and improve representativeness. This is important to bear in mind when interpreting survey results. Accordingly, this report refers to ‘participants’ rather than ‘NRS’ when describing results from the research.

Further details on the sampled population, survey analysis techniques and data interpretation, including confidence internals and statistical significance, are provided in Appendix 2.

Throughout this report we have tried to make clear the evidence we have drawn upon from the relevant project phases in our interpretation.

Understanding the wider context

Current workforce

There are a number of challenges to estimating the networks workforce. This is important to consider when using figures in this report in conjunction with other published figures, including future workforce projections. Further details on our approach to measuring the current networks workforce is set out in Appendix 1.

Drawing on SIC-2007 codes pre-agreed with DESNZ[6], in 2022 the ONS recorded approximately 54,900 people working in electricity transmission and distribution in Great Britain. Of these, 3,800 worked in transmission and 51,100 in distribution.[7]

However, it is unclear how much of this is 'permanent' workforce (e.g. those working full-time for an electricity network owner or operator) and to what extent, if at all, it captures the 'project by project' workforce – e.g. those working for contractors on an electricity network project on the day used for estimates.

Data for individual roles is available by region (e.g. for Electrical engineers) but, again, these are not sector-specific. Part of the network's workforce (i.e. that part associated with new projects and new infrastructure) is focused in specific areas, but roles related to, for example, maintenance, are more spread. Forecasting work has identified the regional distribution of new jobs needed to meet the Net Zero challenge (focused in the North, Midlands, Scotland and Wales).[8]

In terms of other differentiating factors besides region, such as a salary and qualification requirements, minimal data was found. There is a wide range of skill levels required (and therefore qualification requirements), which will likely have a knock-on effect on salaries, but no standardised data has been found. Stakeholders talked about the premium salaries that specific projects are able to offer (e.g. Hinckley Point C, Sellafield – see above), but this is fairly anecdotal.

It was pointed out in the stakeholder interviews that many workers in the energy sector, including those involved in electricity networks, do not consider themselves permanently part of

[6] Relevant SIC-2007 codes included: Electricity, gas, steam and air condition supply (2-digit or Division code 35), Electrical power generation; transmission and distribution (3-digit or Group code 351), Production of electricity (5-digit or single code 35,110), Transmission of electricity (35120), Distribution of electricity (35130). It is unclear in this data what proportion of workers are directly employed in electricity transmission, or are contractors, or are part of the wider supply chain.
[7] Drawn from ONS 'GB and UK level employment (thousands) by 2, 3 and 5 digit SIC 2007 (full-time/part-time and public/private sector split)'. Transmission includes "operation of transmission systems that convey the electricity from the generation facility to the distribution system" and distribution includes "operation of distribution systems (i.e. consisting of lines, poles, meters, and wiring) that convey electric power received from the generation facility or the transmission system to the final consumer".
[8] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group.

the sector. They often work on a project-by-project basis, moving between different sectors like oil, gas, and renewables, which complicates workforce quantification.

In terms of understanding the demographic make-up of those currently working in electricity network roles, there are no definitive answers, since there is no data available for just the electricity networks workforce.[9] However, multiple sources indicate a male-dominated workforce. Summary statistics for various high-level groupings suggest a workforce that is c. 75% male.

Women are under-represented in Agriculture, Energy and Water (25%) and Construction (13%). The only named industry grouping in which women represented more than half of the workforce in 2021 was Public administration, education and health (70%).[10] Data suggests a relatively high proportion of women in Nuclear overall (21%) (arguably a sector which the networks sector is competing with), but they are more likely to be in non-STEM related roles (32%).[11]

Of the 41 relevant network roles identified (SOC2020 – not sector specific), just 2 are >50% female (Conservation professionals and Environmental health professionals); others range from 57% to 100% male.

The research has not been able to identify a source of data on ethnicity, either by sector or by role.

Addressing workforce challenges

There are a number of workforce challenges facing the networks sector, which provide important context for this research. These were explored further in the desk research, and through engagement with stakeholders.

Meeting future workforce needs

The UK's Clean Power 2030 and Net Zero commitments rely on reinforcing and building out the country's electricity transmission infrastructure. According to the National Energy System Operator, more than twice as much new transmission network infrastructure will need to be built by 2030 as has been built in the past decade, along with accompanying enabling works, connections and distribution network strengthening.[12] This will require a sufficient pipeline of

[9] SIC data (which is what has been used to calculate overall numbers) broken down by gender is not available, or where gender data is available it is not industry specific.
[10] ONS (2021). *Census 2021 estimate for Agriculture, energy and water* [combined workforce, England and Wales]. Available online
[11] Nuclear Skills Strategy Group (2023). *A scenario-based approach to nuclear workforce planning*.
[12] National Energy System Operator (NESO). (2024). *Clean Power 2030*. National Energy System Operator.

skilled workers in network roles and the associated supply chain to overcome existing skills gaps and grow the workforce.[13]

Whilst there is no definitive published figure on the number of skilled workers that will be required for the sector to meet its Net Zero targets, evidence drawn from the desk research suggests there will need to be significant increases. (There are various estimates, but some of this is hard to precisely quantify, since published figures do not necessarily relate specifically to the electricity networks sector, and definitions of what constitute network roles differ.) According to the Electricity Networks Strategic Framework, reinforcing Great Britain's onshore electricity networks to meet Net Zero could directly support an additional 50,000-130,000 FTE jobs by 2050.[14] [15]

In addition, various organisations have estimated the future workforce needs for wider projects that incorporate (but are not limited to) the electricity network. For example, National Grid, estimates that the Net Zero workforce will require 400,000 new recruits by 2050 (117,000 by 2030, a further 152,000 before 2040, and a further 131,000 before 2050).[16] These ultimately represent significant increases on current workforce numbers (though we are unable to draw direct comparisons between current and projected workforce numbers).

Meanwhile, parts of the current workforce are ageing. For example, according to ECITB's Workforce Census 2021, 38% of the engineering construction workforce is aged over 50.[17] This means that many individuals with the required clean energy skills (including those relating to the network) could retire and leave the workforce within the next 15-20 years , requiring rapid upskilling to limit shortages from the attrition of a retiring workforce.[18]

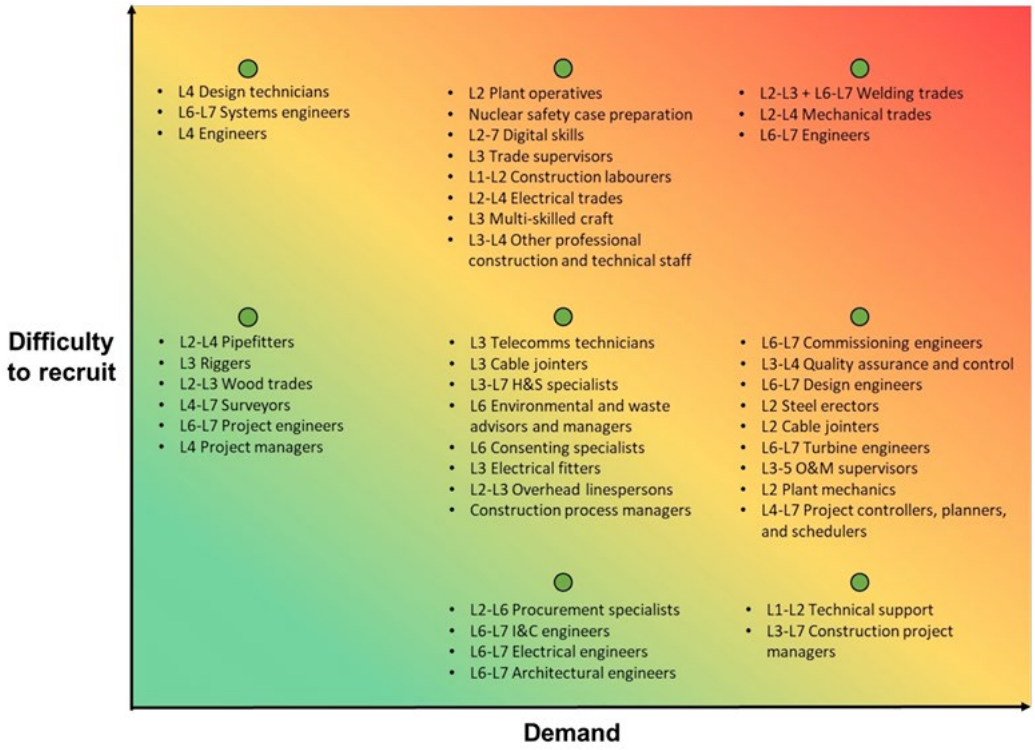
Ultimately, the skills gap is not just about expanding the number of new entrants into the sector. It will also mean reskilling and upskilling the existing workforce. In practice, stakeholders reflected on how this will mean re-training existing network workers on connecting to smart technologies, and identifying crossover competencies that can be transferred from, for example, offshore oil to offshore wind.

> *"In doing that occupational skills mapping of 'these are the number of folks we need', we recognise the fact that the skills system would struggle to deliver that just through new entrants and, therefore, we're trying to understand how we can increase the agility of the system by having a more modular approach targeted at those gaps in people's skill sets." (Industry/Network Employer Stakeholder Interview)*

[13]UK Government (2021). *Net Zero Strategy: Build Back Greener*. Department for Energy Security & Net Zero (DESNZ) (2024b). *Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex*.
[14] Department for Energy Security & Net Zero (DESNZ) (2022). *Electricity Networks Strategic Framework: enabling a secure, net zero energy system*.
[15] [15] These figures are based on the latest available estimates for the number of jobs supported at the time of writing.
[16] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group.
[17] von Blumenthal, F. and Fantini, A. (2021). *ECITB Workforce Census 2021: Overview of the Engineering Construction Industry*.
[18] Department for Energy Security & Net Zero (DESNZ) (2024b). *Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex*.

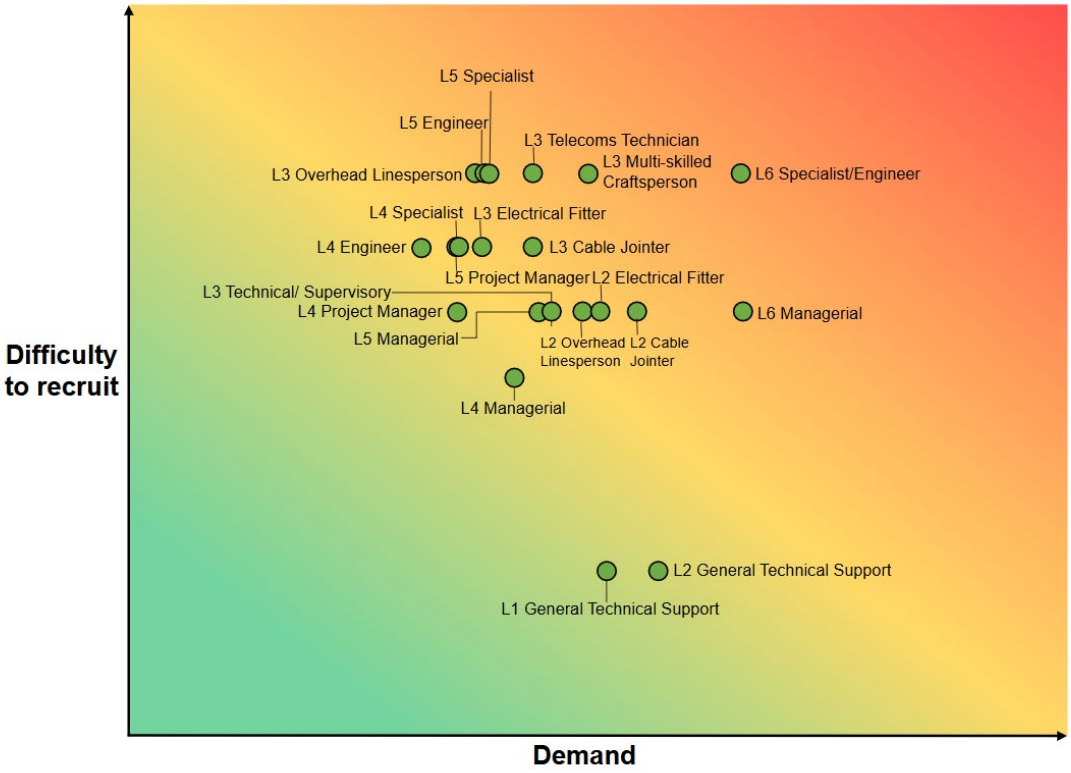
The Power and Networks Task and Finish Group has undertaken a workforce assessment process, which has included developing a heatmap to identify key occupations for the Net Zero transition which are in high demand and anticipated to be difficult to recruit for (see Figure 1). It also highlights some of the most pressing needs in terms of network relevant roles specifically (see Figure 2).

Figure 1: A consolidated view from industry skills bodies of workforce demand and perceived difficulty of obtaining skills across power and network sectors to 2025.



Taken from Department for Energy Security & Net Zero (DESNZ) (2024b). Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex. Available online.

Figure 2: Level 6 specialist/engineer, level 6 managerial and level 3 multi-skilled craftsperson are expected to have the largest workforce gaps for electricity networks out to 2030.



Taken from Department for Energy Security & Net Zero (DESNZ) (2024b). Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex. Available online.

Forecasting of other new roles appears limited, where there is lower visibility regarding developing technologies and their likely future role in the UK's decarbonization plans (e.g. hydrogen).

A gender imbalance remains

The sector is recognised as still having a significant gender imbalance, with women being underrepresented in a range of roles, such as Engineering. For example, according to EngineeringUK, the proportion of women working in Engineering and Technology roles has declined in the past year (to 2024), from 16.5% to 15.7%. In contrast, women make up more than half of the rest of the UK workforce (56.1%).[19] Wider research has shown that this lack of diversity can deter underrepresented groups from pursuing careers in this sector.[20]

Stakeholders were certainly concerned by poor retention rates, noting that many women leave due to unfavourable experiences, such as outdated workplace cultures and behaviours that

[19] EngineeringUK (2024). *Spike in women aged 35 to 44 leaving engineering*. Press Release.
[20] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group; Crowhurst, M. and Taylor, A. (2023). *Generation Green Jobs? Exploring young people's readiness for the Net Zero skills revolution*.

persist at middle management levels. This was seen to create a 'permafrost' effect, where old cultures hinder progress despite leadership enthusiasm for diversity and inclusion initiatives.

> *"Retention is more of a problem than recruitment. […] The number of times I've spoken to women in the civil service about, for example, the water industry, and they've said 'Yeah, I used to be an engineer in the water sector, but I left after six months because this is what happened to me.' […] There's almost a permafrost at middle management level of old cultures and behaviours." (Industry/Network Employers Stakeholder Interview)*

Major competition within and across sectors

Both the desk research and engagement with stakeholders demonstrate the challenge faced by the electricity networks sector in competing for the same narrow pool of skilled people within and across sectors (both domestically and globally), as wider industry grapples with meeting Net Zero targets.

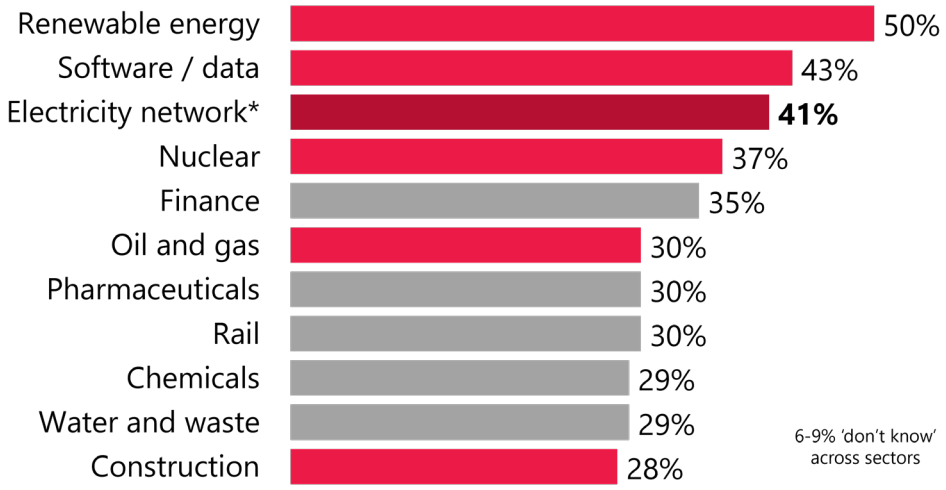
> *"The fact that we [industry] all have a similar time frame in the staged delivery towards [Net Zero] makes it a candidate-driven market. They have the choice of where they want to go. It becomes a bit more difficult to attract them and keep them in the business. There's quite a bit of head hunting and poaching that goes on... Now more than ever we see more movement between companies." (Industry/Network employer Stakeholder Interview)*

Sectors unrelated to Net Zero, but which are high-paying, were acknowledged by stakeholders as drawing away university graduates with STEM qualifications. The wider evidence reinforces this. For example, in the UK in 2019, over 40% of Physics graduates (a key cohort of NRS) opted for careers in banking, finance or technology.[21]

Meanwhile, other sectors, such as energy, utilities, and construction, are recognised as requiring similar skill sets, leading to a competitive job market. This was reinforced through the survey with NRS. It shows that whilst around 2 in 5 (41%) survey participants have or would consider working in the electricity network (including electricity generation, transmission and distribution), it is clearly competing with several other related fields among the target cohort (although is within the top 3 sectors asked about) (see Figure 3).[22]

[21] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group.
[22] The research was specifically looking to understand perceptions of the so-called 'electricity network' sector. Thus, 'Electricity network' was defined here as including electricity generation, transmission and distribution. 'Renewable energy' was allocated in its own category. In practice these sector categories are not wholly exclusive.

Figure 3: Survey findings: Sectors NRS survey participants have considered/ would consider working in



Source: Q12. Have you ever considered (or would you consider) working in any of the following sectors?
Base: Total respondents (303) *Electricity network (including electricity generation, transmission and distribution)
Red bar indicates potential cross sectors with the Electricity Network

It was also noted by stakeholders that apprentices and vocational learners have skills that are needed to support other Net Zero drives (for example, heat pump rollout) or wider Government priorities, such as housebuilding targets. This competition can lead to a shortage of available talent and increased poaching of trained employees between sectors.

Poaching of staff was in turn felt by stakeholders to undermine efforts to collaborate across the private sector to tackle the wider skills challenge. This was seen to lead to inefficiencies and duplicated efforts, as sectors independently pursue similar goals without sharing resources or knowledge.

> *"There's a real sense [in the private sector] of not wanting to do anything that might benefit another employer, even if it also benefits yourself." (Government/Advisor Stakeholder Interview)*

> *"It's counter-intuitive, [given] the sheer number of people we need in these jobs for solar, offshore wind, carbon capture, hydrogen, electricity networks, railways... it doesn't make any sense for every one of those sectors to be individually recruiting and trying to compete with each other. Because someone is going to lose and there aren't going to be that many winners." (Government/Advisor Stakeholder Interview)*

Industry stakeholders (both in the interviews and at the stakeholder workshop) also noted that recruitment challenges can be further compounded by wider immigration policy, including salary thresholds for visas and the inclusion of particular jobs on the skills shortage lists.

An outdated view of the roles needed

Stakeholders felt that qualifications which currently define whether someone would qualify to work in the electricity networks sector can feel narrow and outdated. It was noted that adaptations here can be quite fast-paced, based on the needs of the market. Yet, many still see energy and utilities as a pre-digital sector. People still relate to the sector through the lens of traditional engineering and 'craft'.

Stakeholders consistently reflected on the need to update the way we think about and define network 'roles'; broadening it beyond simply maintaining and operating the grid, to the emerging job needs of the 'new world' (e.g. digital technology, automation, analytical and AI capabilities, logistics, supply chain, project management and operation roles) and future large-scale infrastructure needs (which will mean surveyors, lawyers, planners and environmental surveyors). Cyber security is seen as an increasing threat and one receiving more focus.

Meanwhile, it's important to consider 'lower-skilled' roles – e.g. diggers and scaffolders – which currently fall out of scope in the NRS definitions identified by DESNZ for the purposes of this specific research project.

> *"We're thinking about the workforce in the same way we have done in the last century." (Professional Institution/Representative Body Stakeholder Interview)*

> *"Automation and digitalisation opens up greater risk - so right now it's a big focus point and a lot of focus is going on in expanding that team... we have introduced grad apprenticeships in cyber security." (Industry/Network employer Stakeholder Interview)*

> *"We also need people who will be actual boots on the ground; how do we survey where things need to go, how do you do environmental surveys, how do you do the civil works required, how do you erect pylons and connect cables… and then how do you maintain and operate the system? It's not only a pinch point on technical skills, but also planning and environmental surveys and all the other things that need to be done to enable a project to go ahead." (Academic/Researcher Stakeholder Interview)*

Skills challenges remain

The evidence points to a gap between the skills taught in educational institutions and the needs of industry. The energy transition involves the rapid transformation of professions and labour markets and depends on the availability of a workforce with the necessary education and competencies. However, recent research has found that the rapid adoption of clean energy technologies in the global energy sector has not been matched by changes in higher education. Universities across the globe continue to prioritise studies related to fossil fuels.[23]

Stakeholder feedback demonstrates further challenges in terms of consistency of skill sets among early career NRS, regardless of qualification route. As a result, there were examples of job standards with regards to network roles specifically being reviewed, because transmission network operators feel that certain elements are not working. It was felt that Net Zero, smart networks and the green agenda had not necessarily been considered when the standards were originally developed.

Employers also reported inconsistencies in competencies and knowledge even between graduates and completers of apparently identical qualifications, for example, as a result of different awarding bodies offering qualifications with apparently similar names, but with no or limited standardisation around actual course content. Employers may have their own apprenticeships programs that use these standards, but their apprentices are trained in slightly

[23] Vakulchuk, R. and Overland, I. (2024). *The failure to decarbonize the global energy education system: Carbon lock-in and stranded skill sets.* Energy Research & Social Science.

different ways which can make it challenging when standards need to be transferable. The vast majority of distribution network operators use their own level of technical qualifications (level 4/ HNDs/ HNCs) depending on the aspirations for their trainees. This lack of standardisation makes it difficult for employers to understand the competencies of entry level employees.

> *"You could - and often do – have 5 different qualifications that say that's level 2 Cable Jointing, but the skills [taught] within that are different." (Industry/Network Employers Stakeholder Interview)*

Another reflection from industry stakeholders, was that current training routes (and the particular focus on academic routes for certain roles) are impacting their ability to meet job requirements in a time critical way. This is especially given the length of time it takes to qualify in some roles.

However, Government stakeholders felt that at times these issues can be the result of employers and the skills sector failing to communicate their needs adequately. They are used to hearing from industry that the skills sector is not fit for purpose, but felt in reality the skills sector was underutilised.

> *"If there are knowledge gaps or training gaps that can be delivered by the training provider before that young person enters the workplace then it's on the employer to make that clear to the awarding organisation, to IfATE, to the training provider […]. The system is designed to be employer-led, and I don't know that employers know that." (Government/Advisor Stakeholder Interview)*

> *"The skills system is underutilised, massively, across the board. Current offers are not fully utilised and maximised." (Government/Advisor Stakeholder Interview)*

Stakeholders from the further education sector reported that their courses (in some cases) are actually becoming less specific by design. In England, young people have to stay in education or training until the age of 18, so they pick courses they may not necessarily be that interested in. Colleges then feel a responsibility to the students to expose them to broader subject matter to help them identify what they enjoy, perhaps at the expense of specialisation on the course and to the detriment of entry level employers.

Placement schemes like the Power Academy are seeking to address some of these issues, but developing industry-wide standards appears to be a significant challenge and applying them to all qualification routes presents an additional barrier.

Limited ability for industry to incentivise

Industry regulation is seen as a barrier for employers looking to incentivise their roles and compete with other sectors and high-paying international projects (including in the Middle East) – with a view that the sector is at increasing risk of training up individuals only for others to 'poach' them.

Stakeholders explained that the electricity networks sector faces challenges in offering competitive salaries due to regulatory constraints. This makes it difficult to attract and retain talent, especially when compared to other industries or projects that can offer higher wages.

For instance, one industry employer expressed a need for more Physics graduates, but – as noted above - many are drawn to higher-paying sectors like finance. This issue is compounded by the fact that many sectors are competing for the same pool of skilled workers, leading to a 'fight for talent'.

One employer interviewed believed that that large infrastructure projects like Hinckley Point C and HS2 are able to pay more for the same roles compared to electricity networks, because they are not regulated in the same way. This ability to offer higher wages allows them to attract workers from sectors like renewables, which are already facing a skills shortage.

> *"Big projects like Hinckley Point C are able to pay 50% more for the same role as a standard electricity network, so they can suck people out of the sector." (Industry/ Network employer Stakeholder Interview)*

MAIN FINDINGS

Network relevant qualification routes

The research points to a range of qualification routes, which provide the prerequisites to joining the networks sector. This includes routes via higher education institutions, apprenticeship and vocational qualifications.

Provided in this report are some of the more standardised routes, with more detailed breakdowns offered in Appendix 4, drawing on latest available data at the time of analysis. These routes were agreed with DESNZ and used for the basis of recruitment of NRS participants to the Phase 2 qualitative research.

Higher education

For higher education routes, the research has identified a list of 24 relevant degree courses, based on the CAH Level 3 classifications used by HESA (see Table A4.2 in Appendix 4).

In 2022/23, 158 higher education institutions had students enrolled on one of the 24 relevant degree courses. 76 of these institutions had >2,000 students on relevant courses. The institution with the most enrolments was the Open University (25,935, 6.2% of the total number of NRS on university routes), followed by the University of Manchester (10,330, 2.5%), University College London (9,910, 2.4%) and Imperial College (9,565, 2.3%). All other institutions hosted less than 2% of the total population of students on relevant courses.[24]

While not all courses are taught at all institutions, these 158 institutions do cover all of the UK (including England, Scotland, Wales and Northern Ireland).

Apprenticeships

For apprenticeship routes, in consultation with stakeholders, a list of 85 relevant apprenticeships was compiled (see Table A4.3 in Appendix 4). Data for 59 of these is available for the academic year 2022/23, with approximately 10,000 students in England achieving their qualifications, with an average pass rate of 95%.[25]

Data for providers of apprenticeships is not available at the subject level in the same way as it is for higher education routes. Data has only been found at the overall level (i.e. covering all

[24] HESA (2024b). *HE Student Data*. HESA.
[25] GOV.UK (n.d.a). *Apprenticeships, Academic year 2023/24*. Apprenticeships data available on GOV.UK is for England only.

subjects), so it has not been possible to match educational institutions to student numbers on relevant courses.

Apprenticeships are likely to be far more widely spread as they typically include both a training provider and an employer, where employers may only host a very small number of apprentices.

Vocational and Technical qualifications

Data for providers of vocational qualifications is not available at the subject level in the same way as it is for higher education routes, although many are awarded by further education colleges (See Table A4.4 in Appendix 4 for further detail). According to the Association of Colleges, as of November 2024, there were 260 publicly-funded further education colleges in the UK – 217 in England, 24 in Scotland, 13 in Wales and 6 in Northern Ireland.[26]

Ultimately, this is a more complicated system, as qualifications are not 'end-to-end', but modular. Many students work as they train, so may already be qualified for some roles while studying for a higher level of a related role, gaining additional levels of qualification in the same area. Thus, there is less often a clear 'end point' of qualification as they are almost always combined with work experience.

There is also an emerging field of 'short courses' to fill specific skill gaps (e.g. Government-funded Skills Boot Camps and employer-based training) about which little data is available.[27]

[26] Association of Colleges. (n.d.). *List of Colleges in the UK*.
[27] GOV.UK (n.d.b). *Skills Bootcamps, Skills for Careers*.

Building a profile of 'NRS'

Data on enrolments provides helpful context for thinking about how to meet the future skills needs and workforce growth set out above.[28] The reporting that follows draws on latest available data at the time of analysis that supports the study questions of interest.

NRS study numbers and changes over time

The analysis estimates that there could be over 428,000 NRS currently studying or training in the UK across university and apprenticeship routes, but the total figure is likely to be notably higher if all vocational qualification routes could be taken into account. This is a large potential pool of eligible workers that could be feeding into the future workforce (noting, for example, National Grid's estimates that the Net Zero workforce will require 400,000 new recruits by 2050).[29] As noted above, the NRS survey findings (whilst not based on a representative sample) indicate around 2 in 5 NRS have considered or would consider working in the electricity network.[30] These figures indicate that there is a potentially substantial pool of NRS who could be encouraged to join the network with the right incentives.

Breaking this down, data on **higher education** was used to estimate a total number of around 418,000 students enrolled on relevant courses at UK institutions in the academic year 2022/23. This includes 378,000 enrolled on courses deemed to be of primary relevance to network roles, and 40,000 enrolled on courses of secondary relevance.

Course relevance was determined based on the number and prominence of related network roles for which a given course would qualify its graduates. For example, electrical engineering roles are more prominent and numerous in the networks sector than environmental science roles which are still relevant, but scarcer and/or of lesser prominence in the sector. These figures include students studying full-time and part-time at both an undergraduate and postgraduate level, at any level of their studies (i.e. not only new enrolments, but also returning students).

Further details on the total numbers of students enrolled on network relevant higher education courses by subject can be found in Table A4.5 in Appendix 4.

[28] For both higher education (HE) and apprenticeship routes, lists of specific courses were agreed in consultation with DESNZ and stakeholders. HE student data is taken from HESA. Apprenticeship data is taken from GOV.UK - Apprenticeships, Academic year 2023/24, and is England only. Numbers between HE and apprenticeship routes may also differ markedly as HE numbers include everyone in the UK studying a course, such as Maths or Physics, compared to more highly specialised apprenticeship routes.
[29] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group.
[30] The survey sample includes both current NRS and those NRS who may already be in the workforce, so the figures should not be directly compared.

Data on **apprenticeships** was used to calculate an additional 10,000 students achieving a relevant apprenticeship in the year 2022/23 as a minimum, although data was not available for all eligible apprenticeship courses (59 out of 85, or 69%), and covers England only.[31]

There is some data to suggest these numbers may be in decline in some areas.[32] For example, apprenticeship data shows a decline in Engineering and Manufacturing apprenticeships from more than 7,000 in 2016/17, to fewer than 5,000 in 2022/23. Uptake of some key higher education routes is also declining, for example, Electrical engineering has been in steady decline since the early 2000s.[33]

NRS demographic profile

In terms of the demographic profile of NRS, available data suggests that when it comes to **gender**, as with the wider NRS workforce, most NRS subjects and routes are male-dominated. This reinforces the need to tackle gender divide challenges if more women are ever to be encouraged to enter the workforce.

For **higher education** routes, information is available at the most specific subject level, showing engineering courses tend to be the most male-dominated (Mechanical engineering was 12% female in 2021/22; Electrical and electronic engineering 17% female), although there have been slight increases in female student numbers in recent years. Only a handful of the identified courses are female-dominated. These tend to be smaller (in terms of student numbers) and less directly relevant to network roles (e.g. Environmental and Public Health, Ecology and Environmental Biology, Environmental Sciences).[34]

For **apprenticeships**, data is only available at a higher level (i.e. broader subject area). A pattern is still observable here, however, as data for 2023/24 shows very limited numbers of female students in Construction, Planning and Built Environment (10%) and Engineering & Manufacturing Technologies (10%), but better representation in Science and Mathematics (59%). There is also a general upwards trend since 2017/18.[35] Again, data is limited for other vocational qualifications.[36]

In terms of **ethnicity**, relevant data is available for higher education courses only at the higher subject-grouping level.[37] Higher education subject areas which are relevant to taking up

[31] Apprenticeships data available on GOV.UK is for England only.
[32] As context, according to the Department for Education, it is worth noting that apprenticeships across all subjects dropped over this period, which may in part be because of Covid-19, and in part because of the switch from frameworks to standards (essentially making apprenticeships more rigorously assessed, which may have led to slightly lower uptake).
[33] Royal Academy of Engineering (2024). *CSA Next Steps Paper: Coordinating skills challenges across government.* Royal Academy of Engineering News.
[34] HESA (2024a). *Chart 11 - HE students by CAH level 1 and sex Academic years 2014/15 to 2021/22*. HESA.
[35] GOV.UK (n.d.a). *Apprenticeships, Academic year 2023/24*.
[36] Awards data from Awarding Organisations for vocational qualifications in England regulated by Ofqual is available, but it has not been possible to disaggregate qualification level by subject area as of the time of analysis, so detailed estimates on vocational routes have not been included (see: Vocational and other qualifications quarterly: July to September 2024 - GOV.UK).
[37] We are not able to drill down into more specific network relevant qualification subjects.

network roles are, on balance, more ethnically diverse compared to the average across all subject areas. For example, the student population for Computing was 65% White in 2022/23, Engineering & Technology was 68% and Mathematical Sciences 72%, compared to an average of 72% across all subject areas.[38] There is an observable trend towards greater ethnic diversity over the last decade, with 2014 data for the same courses showing 72% White in Computing, 76% in Engineering and technology, and 77% in Mathematical sciences, respectively.[39]

Apprenticeship data shows less ethnic diversity: enrolments in 2023/24 were 91% White for courses in Construction, Planning and Built Environment, 86% White in Engineering & Manufacturing Technologies, and 76% White in Science and Mathematics. There is a slight trend towards increasing diversity since 2017/18, however, as the proportion of people identifying as 'White' enrolled in each subject area has decreased slightly across the board, from 94% in Construction, 92% in Engineering and manufacturing, and 95% in Science and Mathematics, respectively.[40]

Wider demographic differences between those on university routes and those choosing apprenticeships/vocational routes have been documented in other research. Those attending university tend to be more likely to come from more affluent backgrounds, have higher previous academic achievement levels, etc. Vocational routes tend to be favoured by those with less history of university attendance in their family, and those from less affluent backgrounds (links have been made to debt aversion, which makes earning while you study more appealing – this was reinforced by the primary research findings). Other attitudinal and behavioural differences (e.g. hobbies, career priorities) have also been highlighted.[41]

Understanding educational and career path choices of NRS

The educational pathway and subjects chosen by NRS have significant implications on their career choices and are relevant to understanding how NRS could be attracted to the sector in the future. Although this is not in immediate scope of this research, implications for further 'upstream' interventions are included here.

[38] According to HESA, HE students of White ethnicity accounted for 72% of all students of known ethnicity in 2022/23.
[39] Drawn from HESA (2024b). *HE Student Data*. HESA.
[40] GOV.UK (n.d.a). Apprenticeships, Academic year 2023/24.
[41] IMechE and Gatsby (2018). *Never Too Late: Profiling Female Engineering Apprentices*. Institute of Mechanical Engineers.

Higher education vs vocational routes

Degree route

Among those NRS participants pursuing a higher education route, attending university is often seen as a natural and respectable progression in their education, influenced by societal and familial expectations. Moreover, the desire for social status and to be seen as accomplished can drive students to pursue a university degree route.

The university route can also offer students the ability to delay career decisions, allowing them to focus on their interests rather than on a definitive career path. Among those NRS participants pursuing them, recognised subjects such as Maths and Physics were seen to offer the breadth that would allow them to specialise as they begin to understand what particular elements of the subject they are attracted to. This includes the option to further specialise where degrees serve as a gateway to further academic pursuits, such as a PhD.

> *"I'm kind of assuming that by the end of the course I'll have done enough and understood enough about what I'm doing that it will give me more knowledge on what it is I truly want to do. So, I'm kind of just hoping." (Focus group, Degree route, Mixed gender)*

Vocational route

Motivations among those participants pursuing an apprenticeship or other vocational qualification route differed from those pursuing graduate routes. Vocational routes were seen as more advantageous from a financial point-of-view; a chance to 'earn while you learn', and with less burden from student debt. They also preferred the hands-on experience approach to learning, and what they saw as faster career advancement. Parental and peer influence also played a significant role amongst these participants. Many were encouraged to follow similar paths to that of their parents and peers, who had positive experiences of vocational routes.

Those on apprenticeships and vocational routes are naturally making career defining decisions much earlier than those on degrees courses. This is because they are more likely to be developing a specific skill for a vocation or role in a specific field.

NRS participants highlighted what they saw as a limited availability of vocational routes, especially apprenticeships, which is arguably acting as a potential barrier to pursuing network roles – specifically, that they are not as well advertised and harder to find compared to graduate positions. This is exacerbated by schools apparently more actively promoting graduate routes than alternative educational pathways and their relative benefits (see below).

School influence

Schools play an important role in how NRS make their qualification choices. On balance, NRS participants felt their schools encouraged university attendance over other routes, especially for academically successful students. More traditional subjects like Maths, Physics, and Engineering were also perceived to be more widely promoted than emerging STEM subjects. For those participants undertaking apprenticeships and vocational courses, the lack of

information around the range of options available to them at school age appeared to be a significant barrier to overcome. There were examples of NRS participants on vocational routes only becoming aware of these options through word of mouth or by purposely searching for opportunities. This lack of visibility of alternatives meant some participants had first pursued A-levels, had struggled and then ultimately dropped out. This experience then forced them to reevaluate their options, at which point they discovered apprenticeships as a more preferable qualification route to pursuing a career of choice.

In particular, there appeared to be a lack of visibility about degree apprenticeships. There was some anecdotal evidence from the research that those pursuing higher education routes would have liked the opportunity to do a degree apprenticeship. However, opportunities felt few and far between and their schools tended to encourage more traditional university routes. These courses were felt to offer the 'best of both worlds': the opportunity to get a degree whilst earning and avoiding student debt.

> *"I was kind of looking at doing a degree apprenticeship in Year 12. I just found that my school were definitely more pushing uni, so I wasn't given a lot of information about degree apprenticeships. I thought they were cool because it's like you get a degree and you're getting paid and I've heard there's a lot of STEM ones, so it was definitely something I was interested in. But, I think because we were so pushed into applying for unis, it wasn't something that I looked into much further because I just assumed, well, uni is the right path." (Focus group, Degree route, Mixed gender)*

Subject choice

Their interest in the subject matter - whether stemming from childhood experiences, exposure to the field, or knowledge gained from family and peers – was a key motivating factor influencing NRS participants' choices about qualification routes and associated career paths. Some NRS participants first followed their passions without a clear plan for a career in mind, believing that this would come in time as they gained exposure and experiences of different areas.

> *"When I was little, my parents would buy me Lego blocks or, just things that I can make. And instead of giving me, like, a bunch of sheets to fold, I'll be making tents. I always just wanted to do something different from original things. So, I just felt like I naturally had that passion that I knew I wanted to design or turn things or just do something with natural resources." (Focus group, Ethnic minority, Mixed gender)*

Others took a more pragmatic approach to education. They were more concerned with achieving a career outcome than pursuing general interests. For example, those studying Quantity surveying were doing so primarily with a view to becoming a Quantity surveyor, rather than for pure passion of the subject matter.

Barriers and motivators behind career choices of NRS

Data on NRS study numbers has shown there is the potential to be attracting a substantial pool of NRS into the network with the right approach. There are a range of barriers and motivators uncovered from this research which tell us more about why NRS might pursue a particular career or not, and what might prevent them from taking up roles in the networks sector specifically. Understanding these barriers and motivators will be important in designing suitable interventions that will encourage more NRS into the workforce.

The survey of NRS has provided some overall insights into these key barriers and motivators. In particular, it has enabled us to rank their relative importance, though it must be noted that given survey sample sizes findings should be treated as indicative only here. The qualitative research with stakeholders and NRS has enabled us to then dig further into what lies behind some of the barriers and motivators. These are often two sides of the same coin – i.e. factors can serve both as a barrier and a motivator.

In this next section we set out the overall barriers and motivators from the survey findings and then discuss each of the most important factors in further detail.

Overall motivators: survey findings

NRS participants were motivated by a range of factors when making choices about their future career. As illustrated by Figure 4, these included **job security, the work, environment, progression and pay, contributing wider benefits to society, learning and development opportunities** and **location**.

Among NRS who are working, the most important factors taken into consideration when taking up their current role (for at least 1 in 5 of them) were similar. They included: flexibility such as hybrid working (cited by 33%), progression (29%), making a contribution to society (27%), pay and wider benefits (26%), job security (23%) and location (21%) (see Figure A5.4 in Appendix 5).

Figure 4: Survey findings: Careers in general – Motivators (based on top 3 boxes on 10-point scale) | By working status

Source: Q8. T2B SUMMARY: Motivating Factors - Thinking generally, how important or not is the following factor to you when making choices about your future career (which could include what qualifications to do, or what job to apply for)?
Base: Studying (174), Working (161)

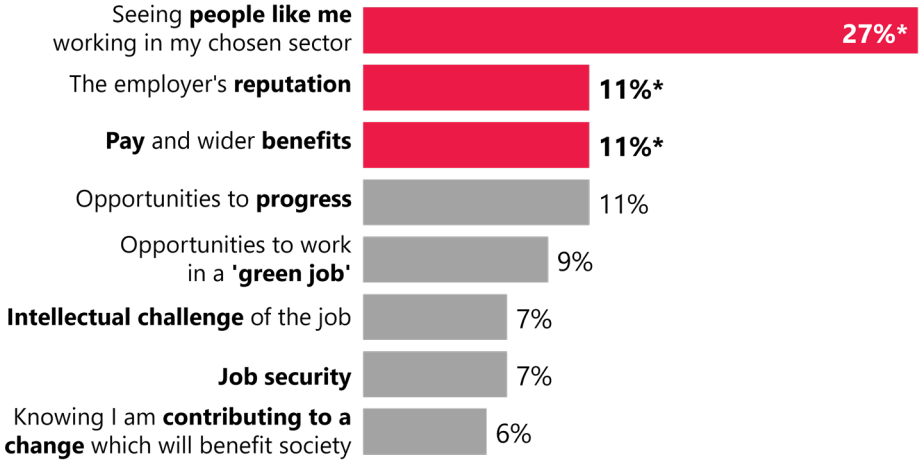
** indicates statistically significance vs. total (exclusive of group) at **95% confidence** interval*

Taken further, the research has been able to identify barriers and motivators specific to consideration of a career in the networks sector, using regression analysis, and disaggregated between degree and vocational qualification routes.[42]

It shows that NRS participants on a university degree pathway (including current students) are most likely to be motivated to take up a career in the networks sector by '**seeing people like themselves working in the chosen sector',** followed by the '**employer's reputation'** and '**pay and wider benefits'** (see Figure 5).

[42] Regression is an algorithm used for Key Driver Analysis (KDA) to unpack the relationship between variables. For further detail, see Appendix 2.

Figure 5: Top motivators regression | Those with (or currently studying for) university degrees, who would consider the network

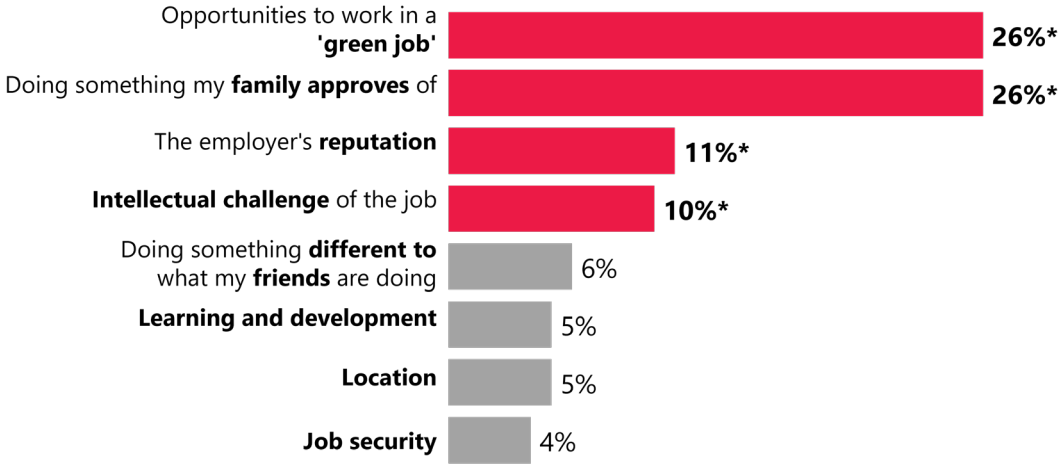


Source: Q12.8. Electricity network (including electricity generation, transmission and distribution): Have you ever considered (or would you consider) working in any of the following sectors? Q8. Motivating Factors
Base: Those with university degrees including current students who would consider the network (210)
Grey bars indicate non-significance

** indicates statistically significance vs. total (exclusive of group) at **89% confidence** interval*

In contrast, among those on a vocational pathway, the biggest motivating factors are having the opportunity to work in a '**green job'** and '**doing something their family approves of'**, followed by the '**employer's reputation'** and '**intellectual challenge'** of the job (see Figure 6).

Figure 6: Top motivators regression | Those with (or currently studying for) vocational qualifications, who would consider the network



Source: Q12.8. Electricity network (including electricity generation, transmission and distribution): Have you ever considered (or would you consider) working in any of the following sectors? Q8. Motivating Factors
Base: Those with vocational degrees including current students who would consider the network (52)

** indicates statistically significance vs. total (exclusive of group) at **80% confidence** interval*

Seeing people like 'me'

As noted earlier, the sector has a significant gender imbalance, with women being underrepresented in a range of roles, such as Engineering.

The primary research with NRS shows that male dominance in a sector can serve both as a barrier and a motivator for female NRS when considering a future career. On the one hand, we heard examples of female NRS participants pursuing relevant network qualifications to help bridge gender gaps in traditionally male-dominated fields, such as finance and STEM (e.g. Maths and Physics). The 'girl boss' feeling and the aspiration to encourage more young girls into STEM appeared to be strong motivators for women entering these fields.

> *"Even though there's been such a big push in the 'women in STEM' movement, I guess there's still 80% men in my course. So, yeah, sometimes it does feel like I'm a 'girl boss'. I think it definitely motivates me. It makes me feel like I am contributing to encouraging more young girls to go into STEM and not shy away from it just because it's not traditionally a job that women go into." (Focus group, Degree route, Mixed gender)*

Anecdotally, this appeared to be quite subject-specific. For example, we heard examples from young women operating in male dominated fields like Physics, Surveying and Computer science of gender stereotypes and feeling 'under-estimated' by male counterparts.

> *"Certain industries might be dominated by certain demographics. Like in Computer science, there's a lot of males that work and that might be off-putting to some women, so they might not go for that." (Focus group, Degree route, Mixed gender)*

On the other hand, the lack of authentic role models for young women in STEM appeared to be serving as a barrier to entry. It could make it more challenging for female NRS to envision themselves pursuing careers in these fields.

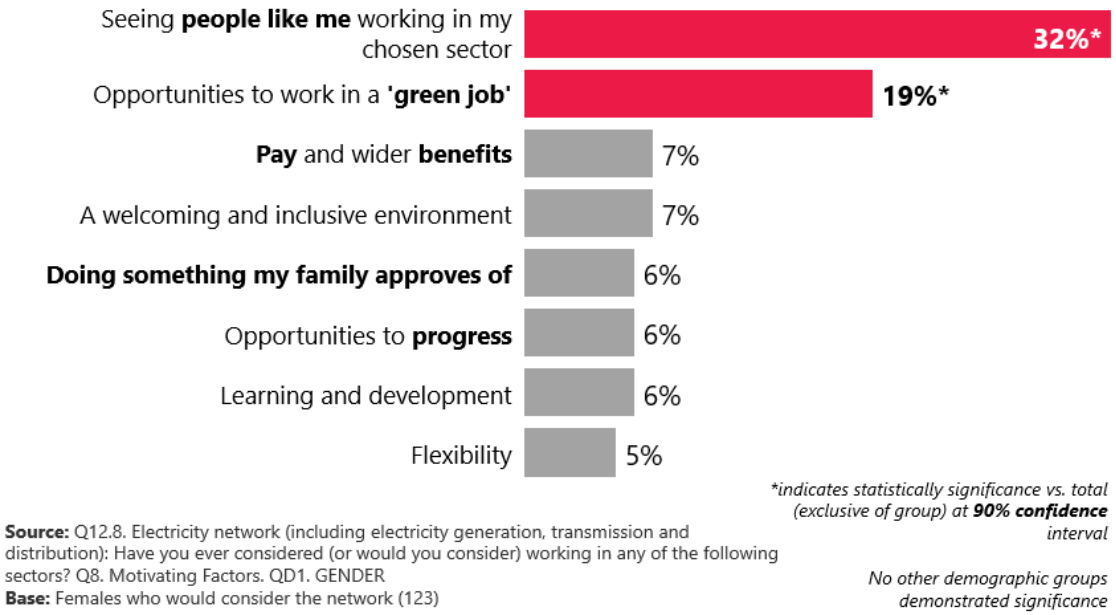
While efforts by academic institutions and employers to promote initiatives supporting more diversity in STEM, including among women, were acknowledged by stakeholders and by NRS in the qualitative research, the actual gender balance was often reported to differ in practice.

> *"A lot of the time universities and companies are really promoting all women in STEM…*
> *But it's just like they're saying it, but they aren't really acting on it." (Focus group, Degree route, Mixed gender)*

Certainly, the survey results demonstrate that more is needed in this space: female NRS are far less likely to say they have considered or would consider a role on the electricity network (34% compared to 48% of male NRS). Yet 'seeing people like me working in the sector' comes out as the top factor for those female NRS who are considering a role in the networks sector (followed by opportunities to work in a 'green job') – see Figure 7.[43]

[43] Based on regression 'Key Drivers' analysis of top motivators for considering a role in the networks sector among female NRS.

Figure 7: Top motivators regression | Females who would consider the network



The survey data also suggests that 'seeing people like me' is also relevant to those from a minority ethnic background. 53% cite this as an important factor when making choices about a future career, compared to 37% of NRS participants who are White.

Opportunities to work in a green job

The wider literature shows that working in a clean or green job can serve as a significant motivator for people seeking out jobs. For example, research by YouGov for National Grid shows 57% of UK adults expressing an interest in working for organisations dedicated to Net Zero. This motivation spans various demographics, with young adults (18-24) particularly passionate about careers focused on tackling climate change, ranking it as the second most important cause they wish to support through their work.[44]

Given the electricity network sector's importance to achieving the UK's Net Zero goals, this is one motivator that could be leveraged to change perceptions and drive consideration amongst NRS.

Building on the wider literature, the research's survey findings suggest Net Zero is a top motivator for NRS in thinking about a role in the sector, especially those following vocational routes (see Figure 6). 7 in 10 (71%) NRS also think the sector makes an important contribution to supporting the climate and meeting the UK's Net Zero targets, so there is something to build on here (see Figure A5.2 in Appendix 5).

However, it is important to note that the 'green' angle does not and will not necessarily appeal to everyone. The qualitative research with NRS illustrated the general confusion around not only what the 'electricity networks sector' is, but also its role in the energy transition to Net

[44] National Grid (2020a). *Building the Net Zero Energy Workforce*. National Grid Group.

Zero; thus making it harder for NRS to immediately see the sector as 'green'. There was an argument put forward by participants that fossil fuels still form a significant part of the UK's energy production, and so given the electricity networks sector transmits and distributes this energy, it cannot be seen as inherently 'green'. Instead, they tended to see certain sub sectors, and specific roles, as 'green'. For example, working in renewable energy production or roles that were specifically focused on sustainability, such as an Environmental impact advisor.

> *"I'd say that I think with the way that energy is based around fossil fuels and that sort of thing, that realistically Net Zero won't be possible for a very long time. So, I wouldn't say that I'd think of these jobs as being Net Zero, but I'd say that they are working towards it." (Focus group, Apprenticeship/Vocational route, Male)*

'Green' jobs can also be associated with trade-offs. For example, there was a prevailing perception among participants that they are generally less well paid than jobs in other sectors they may be qualified to work in, such as finance. This reinforces the challenge the sector faces around being able to compete on pay. According to research conducted by Public First, poor pay is seen as the biggest disadvantage of green jobs, with 25% of young people identifying this as a barrier. The same research also shows that environmental purpose is not always a key factor when weighing up career choices - motivators like 'opportunity for career progression', 'job security' and 'flexibility of hours' are far more likely to sway young people.[45]

> *"No [I would not consider green energy jobs], probably not. To be honest, I think the pay factor is probably quite a crucial part to it. I don't know if the pay would be significant enough of a rise to probably entice me personally." (Focus group, Apprenticeship/Vocational route, Male)*

This all suggests that communications with NRS needs to help them develop an understanding of how pivotal the electricity networks sector will be in the energy transition required to achieve the UK's Net Zero goals. However, this needs to be coupled with other elements of a job that we know to be key motivators for NRS.

Employer and sector reputation

The qualitative research with NRS tells us that employer reputation and prestige play an important role in their career decisions. For example, NRS participants appeared motivated by employers offering prestigious and innovative opportunities, advancement, and alignment with their values. They want to feel proud when talking about their roles, their employer, and the work they had achieved.

> *"[Network jobs] probably aren't as glamorous, for example, as some of the work like … building the Burj Khalifa and coming out of that and you're like, wow. Whereas you might have something from the electricity network that says we built a power plant down wherever it is. I don't know why, but it's probably not as glamorous." (In-depth interview, Male, Degree route, Not working in electricity network sector)*

[45] Crowhurst, M. and Taylor, A. (2023). *Generation Green Jobs? Exploring young people's readiness for the Net Zero skills revolution*.

Conversely, there was some mention among NRS participants of how their association with a company may impact their personal reputation, particularly if it is involved in controversial activities, such as arms manufacturing or international conflicts.

Yet currently, the networks sector is seen as the poor relation: less ‘glamorous’ and not as exciting as those industries it is competing for labour with. Certainly, there was recognition among stakeholders of the need to elevate its reputation in order to attract candidates with the required skillset.

The challenge is not just raising awareness about the sector and what it does, but framing those opportunities in a way that ‘excites’. Stakeholders recognised that understanding what we mean by the 'network’ and ‘network jobs’ and what they involve (not only among students, but also educators and parents) will be important.

The sector could look to offer a more compelling focus on design and innovation opportunities in the sector here (which do exist, even if they are not front of mind), or emerging roles in areas such as cyber security and tech. Stakeholders spoke of the opportunity to promote the networks sector as a dynamic career path to match industries like aerospace and finance. And of its role in supporting large-scale infrastructure projects that the UK will need going forwards.

> *“I think how interesting a project is to them is a big part of it. Some things just aren’t that sexy… a lot of the civil engineering stuff and electrical engineering stuff [relating to the energy network] ends up being a little bit invisible”. (Government/Advisor Stakeholder Interview)*

Pay and benefits

Pay and wider benefits were primary motivators for NRS participating in this research, particularly among those on university routes (see Figure 5).

In the qualitative research, we heard how some NRS will prioritise careers that provide strong compensation, benefits, and a comfortable lifestyle. The high starting salaries and exponential growth offered by sectors such as finance and technology are particularly appealing to these individuals (though some note the trade-off being made with additional stress and long working hours in such industries). Even those NRS participants who did not initially prioritise financial considerations during discussions recognised the importance of competitive pay, especially in high-cost areas like London, where managing living expenses is a key concern.

> *“I need to live out here, man. The economy is tight, and money needs to be made, really. So, you can be comfortable and, you know, do what you want to do.” (Focus group, Ethnic minority, Mixed gender)*

This presents a couple of challenges to the sector. First, there is a stubborn perception among NRS that the networks sector does not pay as well as other sectors they would be qualified to work in – with almost 1 in 3 (32%) agreeing this to be the case, and almost half not sure either way (see Figure A5.2 in Appendix 5). Second, as noted previously, the sector can struggle to match the salaries offered by other industries, making it difficult to attract and retain talent. This pay differential may not necessarily reflect reality – for example, it’s noted in the evidence that clean energy jobs can offer well-paid careers, with relevant jobs tending to be advertised for

salaries above the UK average.[46] However, when compared specifically to other highly skilled sectors, they are often lower paid. For example, low carbon finance jobs pay more than the average job or the average high skilled job, but may not pay more than the average job in finance.[47]

Identifying other, more indirect, monetary benefits will be important here. This could include financial support to help alleviate the burden of education costs and providing additional value through training and networking opportunities. For example, initiatives like the Power Academy[48] offer a comprehensive package including tuition fee payments, bursaries, funds for course materials, IEEE membership, vacation training, and a summer school focused on business-related issues.[49]

Family and community influences

Among NRS engaged through the research, family was a key factor in influencing qualification pathways.

> *"I think it does matter what my family think because they do have a lot of say into what I do… If they don't like something and I really want to do it, I'll still do it. But, I do factor in what they all think. And because at the end of the day, I am their child…" (Focus group, Ethnic minority, Mixed gender)*

This was particularly evident in fields perceived as prestigious, such as Physics, where making the family proud was a strong motivator. One participant was particularly interested in pursuing Astrophysics as part of their course and found the prestige their family associated with this as a key motivator.

> *"In a way, being able to make my family proud of what I'm doing is a motivation. When I get to tell my family members, 'Hey, I'm doing Astrophysics,' they're like, 'Wow, that sounds impressive." (Focus group, Degree route, Mixed gender)*

It is also more evident among those from an ethnic minority background. We saw this echoed in the quantitative survey where NRS from Black, Asian and Minority Ethnic groups were more likely to score 'doing something my family approves of' as a more significant motivating factor in career choices (41% top 3/10 box) compared to those from White backgrounds (28% top 3/10 box).[50]

In some cases, NRS in the qualitative research who had family members working in specific sectors, like finance or surveying, said they were inclined to follow similar paths due to admiration and familiarity with the field.

[46] Department for Energy Security & Net Zero (2024b). *Clean Power 2030 Action Plan: A new era of clean electricity – assessment of the clean energy skills challenge – evidence annex*.
[47] Sato, M., Cass, L., Saussay, A., Vona, F., Mercer, L. and O'Kane, L., (2023). *Skills and wage gaps in the low-carbon transition: comparing job vacancy data*.
[48] The Institute of Engineering and Technology (n.d.) *The IET Power Academy*.
[49] Energy and Utilities Skills Partnership (2020). *Many Skills One Vision: Energy and Utilities Workforce Renewal and Skills Strategy*.
[50] Survey question Q8, code 12: 'Doing something my family approves of.' See Appendix 3 for questionnaire.

Meanwhile, some 'first-generation' NRS participants, whose parents did not go to university, felt the need to pursue practical fields like STEM, because they were seen to offer better job security and financial stability. This was driven by a desire to make their families proud and avoid disappointing them by choosing less conventional paths.

For more vocational routes, there were examples of NRS participants even completing their apprenticeships at the companies their family own or work for.

> *"I was quite practical about the degree that I wanted to do because I'm the first generation in my family going to university. So, I didn't want to tell my parents who did quite practical things when they were younger that I was going to go and study art... For me, I felt like I needed to have a kind of set ideal career path, so that influenced me." (Focus group, Degree route, Mixed gender)*

Location

A view from stakeholders was that network roles have always been focused and embedded in certain localities (e.g. around power stations). For example, local employers often link up with local training providers to get local people into jobs. However, as the electricity network sector transitions towards Net Zero, expansion of the network may disrupt this geography, as workers will be needed in areas without an existing base. This presents the need for an agile and mobile workforce.

Stakeholders reflected that the extent to which geography influences NRS career decisions can differ by educational route. Higher education graduates are seen as traditionally more mobile, whereas further education providers find they are having to put more time and resource into encouraging students in NRS roles to be more open to a range of work locations.

Location has been shown to be an important career choice motivation in the survey (cited by 58% of NRS – see Figure 4). The qualitative research shows how it can be both a positive and negative force.

For example, some NRS participants expressed that long commutes can be exhausting, negatively impacting their mental health and work-life balance, which leads them to limit their job options to nearby locations. Additionally, the mental toll of relocating away from an area they are attached to can be overwhelming. As a result, some NRS prefer a more familiar work environment, which restricts their career choices to local opportunities. Other responsibilities and life priorities can also start to compete. For example, those recent NRS with young children found that uprooting their families or working in other locations for long periods of time was challenging and disruptive to their personal life.

> *"If you have to do an hour a day there and then an hour back, I think it's too much. It really does take away from the time that you have free, and I feel like it would take a mental toll on you… Or say you've been relocated somewhere - to get used to the new city and your surrounding areas does also take a mental toll on you, I think." (Focus Group, Ethnic minority, Mixed gender)*

On the other hand, the chance to travel for work in diverse locations and environments can be of positive appeal to NRS. The opportunity of exploring new countries and cultures, along with

learning new languages, is seen to contribute significantly to both personal growth and professional development. Travelling for work is also viewed as enhancing CVs and career prospects. Some participants felt that gaining business experience in different locations can also provide valuable skills and experiences that will appeal to future employers. Whilst these may serve as motivating factors for NRS, they are not necessarily helpful when considering how to promote future network roles, which are firmly based in the UK.

> *"I feel like I do kind of really want to explore different countries and different cultures and learn languages. If I had a job where I could go to Japan or Germany to do something that's exciting, I think that would definitely motivate me." (Focus Group, Degree route, Mixed gender)*

More generally, it was felt that students of today increasingly see flexibility and work-life balance as crucial factors in their career decisions. For example, some spoke of the appeal of hybrid work arrangements; something which is seen as increasingly important with family commitments. Others see the value of 'being their own boss' and the flexibility of being able to set their own work hours.

> *"You can kind of dictate your hours or you can start earlier, finish earlier. When you start subcontracting once you're qualified, you can maybe work for six months, lots of hours, take a month off because you've got the freedom to jump around, I mean you can always travel with that. You just use your time in the way that you want to…" (Focus group, Apprenticeship/Vocational route, Male)*

Ultimately, the research suggests that NRS are not all that convinced that the electricity networks sector could offer them the opportunity to travel and work in different locations, particularly abroad. At the same time, the sector is mainly associated with jobs in more rural or isolated locations. Unpicking the range of location opportunities, and flexibility within roles, offered by the sector will be important to challenging some of these perceptions.

Job security

The competitive nature of the job market makes job security an important motivator for NRS. It came out as the top motivator when making choices about a future career among the NRS surveyed – by 67% of those still studying and 78% of those working (see Figure 4).

Fields like Computer science were seen as highly competitive, and there were concerns about the longevity of certain skills and trades in the rapidly evolving economy. This appeared to lead NRS participants to be cautious when planning for positions that may no longer exist by the time they complete their education.

> *"Because the field is changing so much, you might not even know what positions are going to be out there by the time you're done with your degree, by the time you're ready to get a full-time job…" (Focus group, Degree route, Mixed gender)*

Stakeholders emphasised the importance of the electricity networks sector to national infrastructure, and the need for ongoing expansions of the network to meet the UK's Net Zero targets. This makes job security an obvious benefit the sector can offer. Therefore, leveraging job security in messaging and communications could encourage NRS into roles within the sector.

Career progression and skills development

The research tells us that NRS look for sectors and roles that can offer them long-term career progression and skills development. They clearly value roles that prioritise their personal and professional development, as they associate leadership or specialist positions with more autonomy, pay, and wider benefits.

> *"I feel like if there's progression in the company, it gives me like an aim to go for. Whereas if I'm just in one role and I can't move, I'll probably get a bit unmotivated…" (Focus group, Degree route, Mixed gender)*

The wider research demonstrates how employers and educational institutions are increasingly acknowledging the lack of visibility of development opportunities within the networks sector. Developing leadership skills has long been essential, not only to equip individuals with the advanced leadership capabilities needed to drive business, but also to create appealing in-house career advancement paths for graduates. For example, programmes like Aston University's Master's degree in engineering leadership and management are assisting engineers in transitioning to senior leadership roles.[51] This will continue to be an important area to focus on in encouraging NRS to network roles.

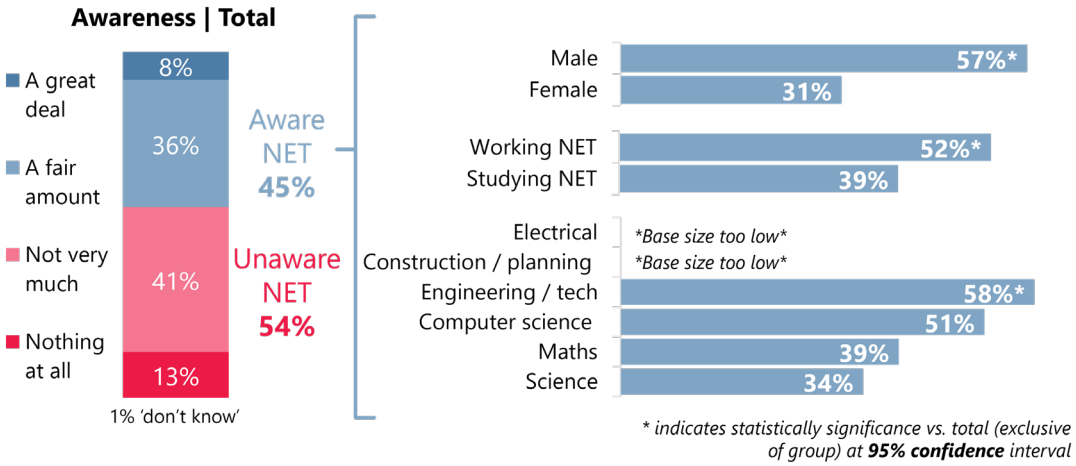
Poor sector awareness

Whilst not included as a specific barrier or motivator within the survey regression modelling, the research has clearly highlighted the lack of awareness and understanding of the 'electricity network sector' among NRS.

Amongst the survey sample, 45% were aware of job opportunities available in the sector, of which only 8% reported knowing a 'great deal' (see Figure 8). Awareness also appears to be higher among those NRS participants on traditional engineering qualification routes, and male NRS participants.

[51] Energy and Utilities Skills Partnership (2020). *Many Skills One Vision: Energy and Utilities Workforce Renewal and Skills Strategy*.

Figure 8: Survey findings: Awareness of opportunities in the network sector



Source: Q16. Before today, how much would you say you knew about job opportunities in the electricity network sector?
Base: Total respondents (303), Males (154), Females (144), Working (161), Studying (174), Electrical – all routes (20*), Construction / planning – all routes (11*), Engineering / tech – all routes (115), Computer science – all routes (79), Maths – all routes (51), Science – all routes (143)

The qualitative research shows NRS participants tend to be more familiar with specific constituent parts of the electricity networks sector, rather than the sector as a whole. For example, they mentioned hearing about the National Grid, though they often lacked an understanding of its specific role within the sector, and certainly did not appear to understand it was just one of a number of transmission operators. They struggled to picture what roles would be involved as part of the electricity network sector, or what qualifications and skills might be relevant.

Even among those working in the sector, the term 'electricity network sector' did not particularly resonate with how they conceptualised energy production, transmission, and distribution. Instead, there was a tendency to identify with only their specific part of the sector, or a specific trade or profession.

> *"Electricity network? It isn't something that I would think of actively. The transmission and distribution of the network itself is how I would say it." (In-depth interview, Male, Degree route, Working in electricity network sector)*

Raising awareness of the sector, and the range of opportunities offered with different entry levels, is clearly an important component to attracting NRS to the sector going forwards.

Currently, 2 in 5 (41%) survey participants have considered or would consider working in the electricity network (see Figure 3 above). Importantly, the survey shows the greater the level of awareness about the sector, the greater the likelihood of considering a job in it (see Figures A5.1 in Appendix 5).

> *"Knowing about it is the first step of looking into it… once I get qualified fully then it could be something I'd look at as that next step in my progression in my career and trying to find exactly what I want to do." (Focus group, Apprenticeship/Vocational route, Male)*

NRS participants, whilst pursuing qualification routes relevant to a role in the sector, did not necessarily see electricity networks as relevant to them and their skills set. However, once

prompted with a clearer definition about what the sector is, and some of the relevant roles within it, participants in the focus groups could see how they might be qualified to work in the sector. Survey findings help to reinforce this. On being offered a clearer definition of the sector, almost 6 in 10 respondents agreed that there are roles in the network sector they would be qualified for.[52]

> *"I know way more than I did before this conversation. So yeah, it's definitely something that I would consider in the future." (Focus group, Apprenticeship/Vocational route, Male)*

During group discussions, current NRS struggled to recall instances where they had come across advertisements or information regarding the electricity networks sector. When they compared this to the outreach work other sectors regularly targeted them with, this was felt to be a missed opportunity.

> *"It's not really advertised much. Like, for example, I can say off the top of my head, as a Physics student, we get bombarded with military. The military being like, come work for us. We can give you like money for your degree… and even when you go to like a career event, it's not the thing that really sticks out… I can't even say that I remember seeing any stands advertising the electricity network as an option." (Focus group, Degree route, Mixed gender)*

Ultimately, recent and current NRS participants across both the qualitative and quantitative research reported using a range of sources to learn about and make career decisions (including employer websites, career fairs and relevant work experience). More can be done to capture the imaginations of these students where they are already at.[53]

Furthermore, NRS taking part in interviews and group discussions reported the absence of early education and established channels for information dissemination further 'upstream' (e.g. early career fairs or school resources). This appeared to contribute to a lack of engagement among NRS with the sector, and specifically to selecting qualification routes to get them there.

Other barriers to entry

Other barriers to entry were also noted through the research.

For example, stakeholders reflected that the roles and routes to a career in the networks sector (e.g. Engineering) tend to be associated with academic qualifications, which reduces the talent pool and puts off some who could in theory access a network role via a different route.

Stakeholders also reflected that often routes to a career in the networks sector involve standard qualification requirements that people coming to the sector may not have, or have

[52] See Figure A5.2 in Appendix 5. Network definition provided: The UK's electricity network includes all stages of electricity generation, transmission, and distribution, connecting power stations and generators such as windfarms to domestic and industrial users. This includes the nationwide system of pylons and cabling connecting everything together. Job roles in the sector include engineering, construction, planning and logistics roles, among others.

[53] See Figure A5.3 in Appendix 5 on career events and initiatives NRS have engaged with by qualification route.

struggled with. For example, having a certain level of qualification in core subjects such as Maths, can – as one stakeholder put it - "by default […] switch a lot of people off".

Wider research has also shown that many young people assume that green jobs, including those in the electricity network, require advanced degrees, which deters those who are not on an academic track from considering these roles.[54]

Graduates with non-STEM backgrounds face additional barriers due to the need to obtain STEM-related postgraduate degrees or certifications to enter the sector. This requirement can be a significant deterrent for those without an initial STEM education.[55]

Finally, there was a perception among some stakeholders that knowledge around alternative technical and vocational options is low among parents. This is relevant when considering just how important an influence parents have been shown to be on early educational and career decisions. This has come through from both the qualitative insights from this research, and the survey with NRS. For example, among survey respondents with (or currently studying for) vocational qualifications, and who would consider working in the network, 'doing something my family approves of' is their top motivator.

NRS survey segmentation

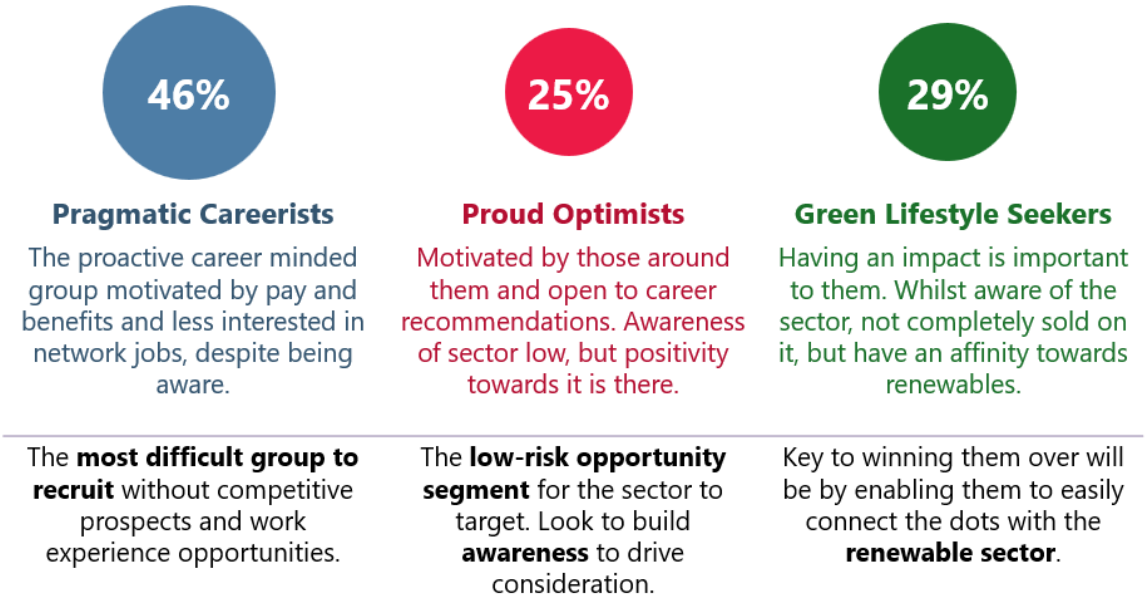
Whilst acknowledging the limited analytical power of the NRS survey sample, it has allowed us to identify, in broad terms at least, how NRS audiences could be segmented for the purpose of any future communications or campaign targeting aimed at attracting NRS into network roles. This segmentation exercise has revealed 3 distinct segments of NRS that differ in terms of their career motivations – as set out in Figure 9. Further descriptor information is provided in Appendix 6.

Whilst the segments help to cluster the survey sample by significant factors and attitudes towards the electricity network, segments are not meant to be considered in isolation. As noted elsewhere in this report, NRS have been found to be a broad and varied group, but these segments can begin to highlight broad clusters of NRS that share similar attitudes, beliefs, and preferences related to their careers.

Proud Optimists look to be a low-risk opportunity for the sector to target. Positivity and openness towards the network is already present for this group. **Green Lifestyle Seekers** could also be considered worth targeting. For this segment, it will be important to build awareness around the sector's association with renewable energy, which may not be known or understood by all.

[54] Crowhurst, M. and Taylor, A. (2023). *Generation Green Jobs? Exploring young people's readiness for the Net Zero skills revolution*.
[55] Arueyingho, O., Chitchyan, R. and Bird, C. (2023). *Career progression and skills in Smart Local Energy Systems. Applied Energy*, 349, pp.121596–121596.

Figure 9: NRS survey: segmentation



Source: Q8. Motivating Factors Q9. Thinking about your career, please tell us how much you agree or disagree with the following statements. Q11. YES SUMMARY: During your studies, did you ever attend, or do you plan to attend, any of the following types of career events or initiatives? Q17. To what extent do you agree or disagree with the following statements about working in the electricity network sector?
Base: Pragmatic Careerists (139), Proud Optimists (76), Green Lifestyle Seekers (88)

Conclusions and recommendations: Future targeting of NRS

Key reflections

This research set out to understand the potential pool of Network Relevant Students (NRS) that could join the future electricity networks sector, current barriers and motivations amongst NRS to working in network roles, how these manifest across different groups, and how NRS could be effectively encouraged to join the workforce.

It has also aimed to provide an updated picture of the potential NRS 'pool', qualification routes and demographic profile (though it has not been possible to come up with fully definitive figures for NRS across the UK, primarily due to the nature of the data available in the public domain at the time of writing, and because NRS are not a perfectly defined cohort). This analysis has found that there is a large potential pool of eligible workers that could feed into the future workforce, estimated to be at least 428,000 NRS currently studying or training in the UK.

The research has also identified a number of critical issues facing the sector in meeting future skills needs. These include a need to tackle the sector's gender imbalance, and to increase awareness of what the sector is and the roles within it. These will be important to elevating the sector's image so it can more effectively compete in the wider jobs market.

The research has also identified specific findings about the factors that are most important in influencing different groups of NRS when considering their career choices. By understanding more about the career motivations and barriers for these groups, and how they respectively navigate their career journeys, we can ensure messaging is targeted appropriately.

There is already considerable work going on across the sector to help address some of the skills challenges set out in this report. This research was not intended to provide a root and branch mapping of all of this activity, but it has uncovered a number of initiatives and work streams that are relevant to note, and which can be built upon (for example, the Power Academy, various work experience and educational initiatives, and communications and advertising activities). The Office for Clean Energy Jobs has now also been established within DESNZ, working to ensure the UK has the skilled workforce needed for the Net Zero transition. Membership bodies, such as the Energy and Utility Skills Partnership, are also pooling resources and co-ordinating knowledge-sharing across industry employers. Further details about what the research found on existing interventions can be found in Appendix 7.

Recommendations

Government has made commitments in the Clean Power 2030 Action Plan to exploring public awareness campaign options, working with industry to coordinate messaging which promotes the opportunities from clean energy jobs, such as those in the electricity networks sector.[56]

Based upon this research - which examines the factors that influence NRS in their career choices and draws on insights from relevant stakeholders - the findings point to a range of possible interventions that will help to support this endeavour. These include the following.

A need to 'reframe' how people see the sector. This feels all the more pertinent given the weight NRS participants placed on employer and sector reputation. There is an opportunity here to talk to the bigger picture of Net Zero and the scale of the change needed (though not at the expense of other career motivators), but also to the design and innovation opportunities in the networks sector, and emerging roles in, for example, cyber security and tech. The sector can be better promoted as a dynamic career path, with a wide range of opportunities, to match industries like aerospace and finance. There is a good story to tell, but it is not being told well enough currently. Emphasising job security offers another clear route in (e.g. the green economy as the growth economy, or the long-term national infrastructure investment needed in the network).

An opportunity to coalesce around a mission statement. The research demonstrates just how diverse a cohort NRS are, in terms of their demographic profile, the subjects studied, qualification pathways and career motivations. Treating them as a single homogenous audience for the purpose of communications activity is likely to yield limited value. However, stakeholders on balance felt that a cohesive message or mission statement could help raise awareness and engagement among NRS about the networks sector. This could involve highlighting the sector's role in achieving Net Zero emissions or 'powering the nation', which are compelling narratives that resonate with broader societal goals. Developing a master brand or a common logo that all organisations in the sector can use might help create a unified image and message.

This could be part of a broader campaign that ties together various activities and initiatives across the sector, coupled with a more discrete focus on individual cohorts of NRS. For example, a combination of overarching messages and targeted, localised campaigns might be necessary to address the diverse interests and motivations of potential candidates. It could also draw from the NRS survey segmentation, with a particular focus on Proud Optimists and Green Lifestyle Seekers, as those cohorts more amenable to considering a role in the sector.

Meet NRS where they're at. The focus of this research has been deliberately 'downstream'; it has looked at early career NRS, rather than those still of mainstream education age. However, findings highlight the importance of targeting NRS where they are at.

[56] Department for Energy Security & Net Zero (2024a). Clean Power 2030 Action Plan: A new era of clean electricity.

For NRS on more academic routes, this is likely to be more effective towards the end or immediately after their degree. Graduates, in particular, are potentially looking for more generalist roles, so highlighting the variety of careers in the networks sector (beyond traditional engineering and 'craft') will be important. It's also important to consider here where opportunities are promoted - not on, for example, energy-specific sites, but those places where grads currently access information about future careers (see Figure A5.3 in Appendix 5 for more detail on what the research with NRS says about this). Certainly, feedback from NRS participants suggests there is a lack of advertising and promotion of the sector through routes like career fairs, which feels like a missed opportunity.

Those on vocational routes are specifically trained for particular roles, which means they may already be too 'specialised' by time they complete their qualification. However, there is some awareness of quick 'upskilling' opportunities to meet immediate local needs (e.g. electricians learning cable jointing). Arguably, communication would be better targeted at this group much earlier. For example, the end of KS4 (when completing GCSEs) is a key decision-making time, so targeted messaging at this point could increase the available pool by the time they qualify as NRS.

Female NRS will be an important cohort to consider here as well. Whilst the effort of academic institutions and employers to promote initiatives supporting women into STEM was noted, the research shows how in practice there remain challenges. Among women, by far the biggest motivator to taking up a career in the networks sector will be seeing more people like them working in the sector.

A need to upskill and reskill. Whilst NRS have been the focus of this research, it is evident that targeted upskilling and reskilling of the existing workforce is just as important – it was a key focus of discussions with stakeholders. More generally, stakeholders cited a growing recognition that tackling the skills challenge will require a flexible approach. This means moving away from the 'siloed' mentality that currently exists through the sector's supply chains and taking a sector-wide systems approach. For example, in trying to meet the demand for skilled people, it's acknowledged that it will be important to consider the overlap of skills between roles, and facilitate worker movement across roles and different parts of the sector (e.g. an electrical fitter could work as an EV charging or heat pump installer) – though the research has highlighted a potential tension for employers who risk investing in training employees who then move elsewhere.

A multi-actor approach is needed. Stakeholders reflected that a multi-actor approach will be needed to help attract a bigger talent pool overall, and address key challenges facing the sector. This includes a range of actors.

Government:

- can establish shared understanding of the wider context;
- can support skills in the sector by, for example, making sure there are adequate training routes available, removing uncertainty around the longer-term picture (e.g. commitments to large infrastructure projects and new technologies);

- has the potential to improve cross-departmental working, and work with Skills England on the specific skills challenges facing the networks sector;
- has the opportunity to lean on industry bodies to share their knowledge, research, connections, and prevent duplication;
- has the ability to support and influence a suitable regulatory framework.

Industry/employers:

- are well placed to inform Government and training providers with relevant, accurate and specific information about the kinds of roles they are looking to fill;
- through coordinated efforts, can help in improving public awareness around the sector and what roles across the electivity networks sector involve (for example, explaining how they contribute to Net Zero, and promoting more about the sorts of innovation going on in the sector).

Education institutions/training providers:

- can continue efforts to integrate with industry/employers to ensure the training they offer is attractive and appropriate both for incoming NRS, and for the employers they will go on to work for.

There is also an opportunity to learn from other sectors competing for NRS – for example, nuclear, renewable energy, and defence. These sectors could be seen to as a 'harder sell' to students on some of the barriers and motivators identified in this research, but can counter this with the extensive investment they are seeing. For example, The Nuclear Skills Taskforce and Defence Skills Group are already working in this space.[57] Whilst not explicitly mentioned in the primary research, other related sectors, such as solar, offshore wind, and onshore wind, have also developed skills strategies to address the predicted skills gaps in their respective sectors.

[57] For example, see https://www.destinationnuclear.com/.

This publication is available from: www.gov.uk/government/publications/electricity-network-jobs-motivations-and-barriers-for-students

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