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Skills for a net-zero economy: Insights from employers and young people

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WorldSkills UK is an independent charity and a partnership between employers, education and governments. Together, we are raising standards in apprenticeships and technical education so more young people get the best start in work and life.

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Learning and Work Institute is an independent policy, research and development organisation dedicated to lifelong learning, full employment and inclusion. We research what works, influence policy, develop new ways of thinking, and help implement new approaches.

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Contents

Foreword	3
1. Executive summary	6
2. Introduction	10
3. Evidence review	13
The green skills needed now, and in the future	14
Green skills demand and supply	17
4. Employer and young people surveys.....	24
Methodology.....	24
Employer survey findings.....	26
Case study: Omron	31
Case study: Energy Skills Partnership.....	35
Young people survey	37
Case study: Institute for the Motor Industry	40
Case study: Partnership between FE and industry paving the way for sustainable construction in Northern Ireland	46
5. Key findings and conclusions	47
Summary of key findings.....	47
Actions committed to by WorldSkills UK.....	49
Conclusions for the UK Government.....	52
Conclusions for Devolved Administrations.....	53
Conclusions for all four nations	54
6. Annex.....	55



Foreword



WorldSkills UK is the international arm of the UK skills system. Our position in the WorldSkills global network gives us a unique perspective on how to develop world-class skills and how to use international best practice to raise standards in apprenticeships and technical education so young people, and employers can succeed. Our diagnostic analysis generates insights on challenges facing the UK economy and how UK skills systems, including WorldSkills UK, can be fit for the future. We commissioned this report to understand how young people can acquire the skills that employers need to support the UK's transition to net-zero, and the role WorldSkills UK can play.

Meeting our ambitions for net-zero carbon emissions is essential for our planet and ecology, but it also holds huge opportunities for the UK economy. Accelerating decarbonisation and the growth of green industries can help unlock jobs and prosperity and give the UK a competitive edge in the race to net-zero. Winning this race and gaining an advantage in the global green economy can cement the UK's position as a leading destination for foreign direct investment, spurring productivity and growth across our nations and regions.

We will ensure that our programmes help young people of all backgrounds to pursue highly skilled careers that support the UK to reach net-zero

Boosting the supply of world-class green skills will be foundational to the UK's ability to capture these prizes. As this report highlights, these skills can range from high quality technical skills in sectors such as construction or manufacturing, to skills such as change management in any sector grappling with their responsibility to reduce carbon emissions.

Despite this, the report demonstrates a stark disconnect between increasing employer demand for green skills, and young people's lack of knowledge. A lack of awareness on green jobs, and what qualifications support progression to these roles, is thwarting young people's aspirations for careers that can combat climate change and drive clean growth. In particular, this is frustrating the aspirations of young women to gain the high-quality skills businesses require to reduce emissions. The report also suggests that the language of 'green jobs' and 'green skills' is yet to resonate with young people, despite their commitment to sustainability.

At WorldSkills UK, we know that harnessing young people's enthusiasm and potential is integral to the development of world-class skills the UK needs to succeed. By commissioning this report and acting on its findings, we will ensure that our programmes help young people of all backgrounds to pursue highly skilled careers that support the UK to reach net-zero.

We are already making progress. Our recent Spotlight on Green Jobs brought together leading employers to inspire young people to consider vocational pathways that lead to green careers. Off the back of a recent report for WorldSkills UK by the Skills Taskforce for Global Britain, we are also aligning our skills competitions programmes to meet the needs of investors in internationally traded sectors such as clean tech, boosting UK competitiveness for foreign direct investment in green jobs and skills.

I would like to thank the Learning & Work Institute for producing this report, and look forward to continued partnership with business, education, and government to make strides towards the objectives we've outlined in this report. Our aspirations for young people must be as bold as our aspirations for net-zero. Together, we can build a globally competitive green economy underpinned by world-class skills.



**Dr Neil Bentley-Gockmann OBE,
CEO, WorldSkills UK**

Foreword



Along with demographic change and advances in technology, the transition to green skills is one of a number of mega trends set to transform the economy and labour market. These shifts are, moreover, interconnected.

The need for “green skills” is therefore not just about new green jobs, but also greening existing roles, increasing economic growth and productivity, and creating opportunities for people of all backgrounds.

Yet this can at times all feel somewhat vague. What is a green job? What are green skills? When will these be needed? We can only harness the opportunities ahead if we understand what they are.

I’m grateful to World Skills UK for partnering on this research, which aims to shed some light on these questions and explore the understanding of them among young people and employers.

What we’ve identified is a challenge and an opportunity. The challenge is that many young people lack awareness and understanding of green jobs. This is despite many employers saying they urgently need skills that can help them decarbonise.

The opportunity is that many young people are highly motivated by careers that support sustainability, and to develop the skills businesses need to succeed in a net zero economy.

How do we grasp that opportunity? Employers can attract talented young people by demonstrating the difference they are making to our transition to net zero. Employers and educators need to be clear about green skills and green jobs and build that understanding into curriculum development and careers advice. We also need to ensure that this intelligence is built into our skills system, so that qualifications and provision reflect what we need now, build on what the future may hold, and can adapt rapidly to change.

In other words, we need to build bridges between education, young people, and employers, and ensure the needs of the net zero economy are an integral part of all we do.

The opportunity is there to grasp.

A handwritten signature in black ink that reads "S. Evans". The signature is written in a cursive, slightly slanted style.

Stephen Evans
CEO, Learning and Work Institute



1

Executive summary

Learning and Work Institute (L&W) has conducted research on behalf of WorldSkills UK on how UK skills systems can help young people acquire the high-quality technical skills needed to support the UK's transition to net zero carbon emissions.

WorldSkills UK will use the findings to inform their activity, focused on helping the UK develop a world-class skills economy. This requires the UK to develop high-quality skills in globally traded green sectors, as well as the supply of skills needed to fuel new green industries and the decarbonisation of existing sectors.

The research demonstrates a disconnect between increasing employer demand for green skills and young people's lack of knowledge of what they are. It also highlights the importance of ensuring qualifications and training deliver the skills needed to achieve the UK's net-zero emissions target and allow young people to fulfil ambitions to pursue a green career.

Research scope and method

The study adopted a mixed-method approach, including an evidence review; online surveys with employers and young people, as well as case study development interviews with employers and training providers. This report presents findings from the research and sets out conclusions for policymakers.

For both the employer and young people surveys, the following definition was used: “Green skills are the skills needed to promote a green economic recovery focused on reducing UK carbon emissions. This can range from technical green skills such as those relating to construction, engineering, or manufacturing, to more general green skills such as project management, change management, leadership, education management and communication skills.”

Most young people surveyed feel inspired to pursue a career that can help the UK to reach net-zero and are strongly motivated by a desire to combat climate change

Key findings

1. Most employers surveyed currently require green skills or expect to in the future.
2. For employers that require green skills or expect to, they are needed in a wide range of business areas and at all career levels, but most have had difficulty in hiring suitable candidates.
3. Green skills gaps are having a negative impact on employers' ability to meet their net zero targets and their ability to manage rising energy costs.
4. Most young people surveyed feel inspired to pursue a career that can help the UK to reach net-zero and are strongly motivated by a desire to combat climate change.
5. Young people, particularly young women, lack awareness on green jobs and careers available, the skills employers require, and the relevant education and training pathways.
6. Young people lack awareness and understanding of 'green skills' and 'green jobs', despite their strong commitment to sustainability.
7. Young people and employers agree that the skills for net-zero will be important for future careers, but employers are unsure if the education system is equipping young people with them.
8. Corporate sustainability and social responsibility strategies, demonstrating how a company is having a positive impact on the environment, are vital in attracting young people into employment.

Empower and inspire young people from all backgrounds to build STEM skills, gain jobs, and pursue careers that will tackle climate change

DfE's commitment to make qualifications and apprenticeships more flexible could remove barriers for people to acquire new green skills

As a result of the findings from this report, WorldSkills UK have committed to the following:

1. Empower and inspire young people from all backgrounds to build STEM skills, gain jobs, and pursue careers that will tackle climate change.
2. Launch a new competition programme in renewable energy.
3. Partner with the Institute for Motor Industry to enhance opportunities for young people to gain green skills in the automotive sector.
4. Embed green skills in wider skills competition programmes and support for educators.
5. Assist UK skills providers to deliver world-class standards in green skills development.
6. Work with DfE and IfATE in England and parallel bodies in Scotland, Wales and Northern Ireland, to ensure qualifications and apprenticeships supply green skills that boost UK competitiveness for foreign direct investment.

Conclusions for the UK Government

1. Marketing and communications, such as the *Get the Jump* campaign, could capitalise on the enthusiasm of young people to pursue green careers by helping schools, colleges, and universities signpost to education and training pathways available.
2. The independent Green Jobs Delivery Group, IfATE's Green Advisory Panel, and DfE's Unit for Future Skills all have the opportunity to undertake data-driven action to ensure approved qualifications and apprenticeships support up to date skills and jobs businesses across sectors need to decarbonise.
3. DfE's commitment to make qualifications and apprenticeships more flexible could remove barriers for people to acquire new green skills. This could be complemented through the roll-out of Higher Technical Qualifications and the Lifelong Loan Entitlement.
4. Local Skills Improvement Plans offer the opportunity for employers and skills providers to identify and develop world-class skills that boost their region's competitiveness for foreign direct investment in green jobs.
5. Through the Skills Value Chain, the High Value Manufacturing Catapult can continue to close the loop between the development of green technologies and the identification and delivery of higher technical skills businesses need to harness them.

Conclusions for Devolved Administrations

1. The Scottish Government could ensure the National Strategy for Economic Transformation integrates actions from the Climate Emergency Skills Action Plan.
2. Further to the creation of an 'All Energy' apprenticeship pathway, Skills Development Scotland could explore other opportunities for integrated delivery of skills that high-carbon sectors, such as construction, need to transition.
3. Through the new Employability and Skills Action Plan the Welsh Government has the opportunity to raise young people's awareness of green jobs. For example, Careers Wales, through the delivery of their five-year strategic plan Better Futures, could deliver clear actions to raise awareness of green job opportunities for young people.
4. The Welsh Government could use the forthcoming Net Zero Skills Plan to ensure there are clear actions and accountabilities on: defining and delivering upon industry requirements for green skills, developing national occupational standards, stimulating green skills demand, and building on the labour market intelligence of Regional Skills Partnerships to map and forecast green skills demand.
5. The Northern Ireland Executive should ensure actions taken forward under the Skills for a 10x economy strategy provide a framework for the development of skills needed for high quality jobs in a net-zero economy. The Skills Barometer can ensure employer demand for green skills is mapped and delivered upon and enables Invest NI to market Northern Irish green skills to prospective investors.

Smaller employers could benefit from additional support to understand which qualifications and courses provide green skills for their sector

General conclusions

1. Efforts to attract more women into STEM should point to the importance of STEM skills to net-zero and lever the enthusiasm of young women for green jobs and careers.
2. Highlighting the importance of technical skills to decarbonisation can attract young people to apprenticeships and help build prestige in technical education.
3. As our understanding of green skills grows, and action is taken to reflect employer demand for these skills in qualifications and apprenticeships, enrolment data could offer valuable insights on whether the skills system is producing the workforce needed for a net-zero economy
4. Smaller employers could benefit from additional support to understand which qualifications and courses provide green skills for their sector.
5. Larger employers could have a positive role in helping smaller firms in their supply chain to understand what transition to net-zero looks like, and the green skills required.



2

Introduction

As the UK moves towards net zero, the role of further education and apprenticeship programmes in equipping young people with the green skills employers require is crucial.

Whilst it is not possible to identify all green skills needed for the future economy, there is a strong understanding of potential green jobs in sectors, including construction, manufacturing, and clean energy, as well as the high-quality technical skills businesses will need to create them.

The UK's transition to net zero emissions will require a range of different skills that go beyond what many would consider to be 'technical' green skills. These can be defined as hard skills encompassing the competences involved with the design, construction and assessment of technology usually mastered by engineers and technicians.¹ In addition, more 'general' skills

¹ F. Vona, G. Marin, D. Consoli, D. Popp, Green Skills (2015) p. 14 https://www.academia.edu/12185668/Green_Skills



will also be required, such as management and people skills.² These skills are essential for implementing rapid cultural and organisational change needed to drive business transitions to net-zero and ensure the efficiency of green activities.

There is a divide of opinion on the extent to which net-zero will be delivered through the ‘greening’ of existing roles³, versus entirely new skills and qualifications linked to the creation of new markets and activities⁴. However, embedding green skills within further education and apprenticeships will undoubtedly be important. Positively, governments across all four nations have recognised this challenge and are beginning to undertake efforts to align skills and training programmes with the needs of employers in the green economy. The Net Zero Strategy commits the UK Government to *“reform the skills system so that training providers, employers and learners are incentivised and equipped to play their part in delivering the transition to net zero”*.⁵

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- 2 CBI, Skills and Training for the Green Economy: CBI submission to the Green Jobs Taskforce (2021) p. 3 <https://www.cbi.org.uk/media/6525/skills-and-training-for-the-green-economy.pdf>
 - 3 A. Bowen, K. Kuralbayeva, E.L. Tipoe, Characterising Green Employment: The impacts of “greening” on workforce composition (2018) p. 270
 - 4 M. Aceleanu, A. Serban, C. Burghilea, “Greening” the Youth Employment: A chance for sustainability (2015) <https://www.mdpi.com/2071-1050/7/3/2623/htm>
 - 5 HM Government, Net Zero Strategy: Build back greener (2021) p. 229 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

WorldSkills UK
has committed to
use the findings
to inform their
activity, focused
on helping the
UK become a
world-class skills
economy

Learning and Work Institute (L&W) has conducted research on behalf of WorldSkills UK, exploring how the skills system can help young people acquire the high-quality technical skills needed to support the UK's transition to net zero carbon emissions. WorldSkills UK has committed to use the findings to inform their activity, focused on helping the UK become a world-class skills economy. This includes skills competition programmes, careers advice and support, and the international benchmarking of education and training standards.

The research provides evidence on:

- Current and anticipated employer demand for green skills across sectors.
- The extent to which these skills are currently incorporated in technical education and apprenticeship programmes.
- Young people's understanding of- and appetite for- skills, jobs and careers that would support the UK's transition to net-zero.

The research includes:

- an **evidence review** using Government literature, opinion pieces and research with employers and FE providers.
- a **survey with employers**, exploring their attitudes to climate change, as well as their green skills needs and gaps.
- a **survey with young people**, exploring their knowledge of green skills and their interest in pursuing a 'green career'.
- **case studies with employers and skills providers**, exploring actions and best practice in boosting the supply of green skills and confronting industry shortages.

The methodologies for each of these stages of the research are included at the beginning of the corresponding chapters throughout the report.



3

Evidence review

As part of this research, L&W has undertaken a rapid evidence review, which covers:

- What green skills are needed, both now and in the future, to support the transition to net zero carbon emissions by 2050?
- To what extent are green skills currently embedded within further education courses and apprenticeships, and what range and type of green skills are taught, including where and at what level?
- What are the potential gaps that exist between green skills supply and employer demand?

For the purposes of this evidence review, we have followed the definition that defines green skills as “the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society”.⁶ To limit its scope, this review focused on eight key sectors: (1) construction, (2) engineering, manufacturing and technology, (3) digital and creative, (4) business and finance, (5) health and life sciences, (6) hospitality and lifestyle, (7) transport, and (8) energy and infrastructure.

⁶ OECD, Cedefop, Greener Skills and Jobs: Highlights (2014) p. 1 https://www.oecd.org/cfe/leed/Greener%20skills_Highlights%20WEB.pdf

The green skills needed now, and in the future

Broadly, the evidence indicates that there is a divide of opinion around the level and type of green skills training that is required. Some research suggests that the skills required for the green economy can be largely obtained through retraining on the job,⁷ whereas other studies concluded that the greening of the economy will require new skills, competencies and qualifications linked to the creation of new markets and activities.⁸

The evidence also indicates that green skills can be split into two categories: technical and general.

Technical skills

Technical green skills can be defined as hard skills encompassing the competences involved with the design, construction and assessment of technology usually mastered by engineers and technicians.⁹ Of the eight sectors included in this review, specific evidence on the technical green skills required to achieve net zero could be identified for only half of them: construction, engineering, manufacturing and technology, transport, and energy and infrastructure. For these sectors, most of the research focuses on industry needs as a whole rather than specific employer demands.

The construction industry will play a pivotal role in the UK's transition to net zero and is experiencing increased demand for technical green skills. Research conducted by L&W identified green skills needs relating to retrofit installation, sustainability appraisal and heat pump installation.¹⁰ More specifically, the Heat Pump Association identified skills such as heat loss calculations, hydraulic balancing, pipe and emitter sizing and low flow temperature heating as being important. After workers have gained a knowledge base in these skill areas, they would be able to undertake courses specific to low carbon heating technologies.¹¹ This would provide opportunities for young people to transition from existing roles within the construction sector to meet growing demand.¹²

The construction industry will play a pivotal role in the UK's transition to net zero and is experiencing increased demand for technical green skills

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- 7 A. Bowen, K. Kuralbayeva, E.L. Tipoe, Characterising Green Employment: The impacts of "greening" on workforce composition (2018) p. 270 <https://reader.elsevier.com/reader/sd/pii/S0140988318300963?token=C7F5C52C0BE41CCF265CF253FCA38C70F1D5120452E794A193F94F29D2A77276AD463A632DB048E5F4781E6F7A019432&originRegion=eu-west-1&originCreation=20220113174529>
 - 8 M. Aceleanu, A. Serban, C. Burghilea, "Greening" the Youth Employment: A chance for sustainability (2015) <https://www.mdpi.com/2071-1050/7/3/2623/htm>
 - 9 F. Vona, G. Marin, D. Consoli, D. Popp, Green Skills (2015) p. 14 https://www.academia.edu/12185668/Green_Skills
 - 10 D. Cabral et al, Green Skills Bootcamps (2021, unpublished) p. 23.
 - 11 HPA, Building the Installer Base for Net Zero Heating, (2020), p. 11 https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf
 - 12 J. Williams et al, A Better Future, Transforming jobs and skills for young people post-pandemic (2021) p. 3 https://youthfuturesfoundation.org/wp-content/uploads/2021/10/A-Better-Future-Transforming-jobs-and-skills-for-young-people-post-pandemic_0.pdf

Transport electrification will require a workforce with specialist skills in electrification, batteries, power electronics and electric machines

The engineering and manufacturing sector has a similarly important role to play in the transition to net zero. Within the electric vehicle and low-carbon transport sector, those in manufacturing roles will need technical skills for the assembly of electric motors, computers, electronic control devices and sensing equipment.¹³ More specifically, The Faraday Institution in its 2020 annual Gigafactory study highlights that within Gigafactories (large scale factories required for electric vehicle battery production), production operators and equipment technicians would make up 75 per cent of the workforce, requiring Level 2-3 qualifications in subject areas such as Advanced Manufacturing Engineering. The remaining 25 per cent would need higher level qualifications in areas such as systems engineering, database development engineering and thermal management engineering.¹⁴

Furthermore, higher level skills are increasingly required within railway construction, with technology development including digital transport systems and offsite and modular methods of construction and engineering.¹⁵ Transport electrification will require a workforce with specialist skills in electrification, batteries, power electronics and electric machines. These skills will be needed to meet the growing demand for design engineers, development engineers, systems engineers, electronics technicians, and vehicle technicians as the transport sector progresses towards net zero.¹⁶

Within energy and infrastructure, new engineering skills will be required for offshore wind, such as mechanical, electrical, and control and instrumentation, and blade and turbine technicians.¹⁷ The Green Jobs Taskforce also highlighted the central role that hydrogen production technologies, carbon capture, utilisation and storage (CCUS) and emission mitigation measures in the oil and gas sector will play in decarbonising energy.¹⁸ Current roles in the existing energy workforce, such as pipe fitters and designers, leak test technicians, and offshore barge operators could move to CCUS with some

13 IPPR, Fairness and Opportunity: A people-powered plan for the green transition (2021) p.56 <https://www.ippr.org/research/publications/fairness-and-opportunity>

14 The Faraday Institution, Faraday Report: Annual Gigafactory Study 2020 (2020) p. 5 https://faraday.ac.uk/wp-content/uploads/2020/03/2040_Gigafactory_Report_FINAL.pdf

15 Friends of the Earth, An Emergency Plan for Green Jobs (2021) p. 27 https://policy.friendsoftheearth.uk/sites/default/files/documents/2021-03/EMERGENCY_PLAN_GREEN_JOBS_FEB_2021.pdf

16 High Value Manufacturing Catapult, The University of Warwick, The Faraday Institution, The Opportunity for a National Electrification Skills Framework and Forum (2021) p. 8 <https://hvm.catapult.org.uk/wp-content/uploads/2021/09/National-Electrification-Skills-Forum-Brochure.pdf>

17 Aura, Green Port Hull, Energy & Utility Skills, Skills and Labour Requirements of the UK Offshore Wind Industry: 2018 to 2032 (2018) p. 15 <https://aura-innovation.co.uk/wp-content/uploads/2020/04/Aura-EU-Skills-UK-Offshore-Wind-Skills-Study-Full-Report-October-2018.pdf>

18 Green Jobs Taskforce, Green Jobs Taskforce: Report to government, industry and the skills sector (2021) p. 21 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003570/gjtf-report.pdf

The transition to net zero will require a range of different skills that go beyond what many would consider to be 'green skills'

6 in 10 manufacturers also stated they require management skills to manufacture goods and products in a more sustainable way

Make UK

retraining.¹⁹ To design, test and maximise the potential of these new technologies, the net zero energy workforce will require highly skilled scientists, engineers and designers. The workforce will also require experts in machine learning and those with digital and data analytics skills to improve network planning, maintenance efficiency and risk mitigation.²⁰

For sectors such as digital and creative, business and finance, health and life sciences, and hospitality and lifestyle, there is limited information on the technical skills required both now and in the future. However, a 2021 report by the NHS highlights that low-carbon transport, energy, and construction will be key to reducing emissions within the health service and estate.²¹

General skills

The transition to net zero will require a range of different skills that go beyond what many would consider to be 'green skills'. In addition to industry specialists and technical skills, a successful transition will require people with broader skills, such as management and people skills.²² These skills are essential for implementing rapid cultural and organisational change and ensuring the efficiency of green activities. For example, the Green Jobs Taskforce highlighted project management, change management, leadership, education management and communication skills as vital non-STEM (science, technology, engineering and maths) skills required for the transition to net zero carbon by 2050.²³

In a study conducted by Make UK, 72 per cent of manufacturers ranked innovation skills (skills related to the adoption and diffusion of new technologies) as most needed to achieve sustainable manufacturing.²⁴ Six in 10 manufacturers also stated they require management skills to manufacture goods and products in a more sustainable way.

19 Element Energy, ECITB, Towards Net Zero: The implications of the transition to net zero emissions for the engineering construction industry (2020) p. 8 <https://www.ecitb.org.uk/wp-content/uploads/2020/03/Net-Zero-Report-Web.pdf>

20 National Grid, Building the Net Zero Energy Workforce (2020) p. 14 <https://www.nationalgrid.com/stories/journey-to-net-zero/net-zero-energy-workforce>

21 NHS, Delivering a Net Zero National Health Service (2021) p.19-25 <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>

22 CBI, Skills and Training for the Green Economy: CBI submission to the Green Jobs Taskforce (2021) p. 3 <https://www.cbi.org.uk/media/6525/skills-and-training-for-the-green-economy.pdf>

23 Green Jobs Taskforce, Green Jobs Taskforce: Report to government, industry and the skills sector (2021) pp. 26-27 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003570/gitf-report.pdf

24 Make UK, Sage, Unlocking the Skills Needed for a Digital and Green Future (2021) p.5



Only **13%**
of companies are
fully confident
that they have
the skills to
successfully
compete in a
sustainable
economy

Institute of Environmental
Management and Assessment

Green skills demand and supply

As the UK moves towards net zero, the role of further education and apprenticeship programmes in equipping young people with the green skills employers require is crucial.

Gaps between green skill supply and employer demand

With the economy undergoing rapid transformation, it is not possible to precisely predict all the green jobs that will be created or all the green skills that workers will require. Consequently, a complete analysis of green skills gaps across all sectors is unavailable. However, most early reports in this area indicate that the UK is facing a significant shortage of the skills required to meet the target of net zero carbon emissions by 2050.

Only 13 per cent of companies are fully confident that they have the skills to successfully compete in a sustainable economy, as documented in research from the Institute of Environmental Management and Assessment (IEMA). The same study found that within leadership, only 25 per cent of business leaders and 20 per cent of senior managers are fully capable of addressing the sustainability agenda.²⁵ Research by Onward found that the average skill level within net zero industries is around 26 per cent higher than the current average occupational skill level of a UK employee.²⁶ This is likely due to the important role that

²⁵ IEMA, ISSP, Preparing for the Perfect Storm: Skills for a sustainable economy (2014) pp. 4-5.

²⁶ T. Christie-Miller, A. Luke, Qualifying for the race to net zero: How to solve the net zero skills challenge (2021) p. 13 <https://www.ukonward.com/wp-content/uploads/2021/07/Qualifying-for-the-race-to-net-zero-FINAL.pdf>

Of the current occupational categories related to net zero, **56%** require STEM skills

Green Jobs Taskforce

an estimated **750,000** construction workers will either retire or be on the verge of retirement in the next 15 years

Institute for Public Policy Research

STEM skills have in these industries, with the transition to clean energy likely to require significant numbers of people trained in high level STEM skills.²⁷ This is further supported by analysis from Onward showing that 42 per cent of current workers in net zero jobs are educated to degree or higher education level, compared to 26 per cent in carbon intensive industries.²⁸

The Green Jobs Taskforce also noted that STEM skills “will underpin jobs that are key to taking forward the green recovery and delivering net zero”.²⁹ Of the current occupational categories related to net zero, 56 per cent require STEM skills,³⁰ but there is concern that the UK is underprepared to meet this supply challenge. Out of the 38 countries in the OECD, the UK has the 30th highest proportion of engineering, manufacturing and construction graduates (nine per cent).³¹

The skills gap within construction is especially pronounced. In a survey conducted by the Construction Industry Training Board (CITB), 78 per cent of respondents anticipated a shortage of skills in their specific occupation when it comes to decarbonisation work.³² Further to this, the Institute for Public Policy Research (IPPR) has highlighted the construction industry’s ageing workforce, with 34.6 per cent of workers being over the age of 50. IPPR estimate that 750,000 construction workers will either retire or be on the verge of retirement in the next 15 years.³³ This emphasises the urgency of both upskilling existing workers to support decarbonisation and attracting younger people with the relevant skills for net-zero construction. Retrofitting skills appear to be urgently needed, with the Climate Change Commission (CCC) highlighting that skills gaps are most prominent in heat pump and energy efficiency installation.³⁴ A survey of the installer industry found that 43 per cent of installers had no experience at all in fitting heat pumps and only 42 per cent said they would be confident in installing one.³⁵

27 Ibid. p.1

28 Ibid. p.23

29 Green Jobs Taskforce, Green Jobs Taskforce: Report to government, industry and the skills sector p. 26 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003570/gjtf-report.pdf

30 T. Christie-Miller, A. Luke, Qualifying for the race to net zero: How to solve the net zero skills challenge (2021) p.1 <https://www.ukonward.com/wp-content/uploads/2021/07/Qualifying-for-the-race-to-net-zero-FINAL.pdf>

31 Ibid p.12

32 CITB, Building Skills for Net Zero (2021) p. 4 https://www.citb.co.uk/media/vnfoegub/b06414_net_zero_report_v12.pdf

33 O. Watkins, D Hochlaf, Skills for a Green Recovery: A call to action for the UK construction sector (2021) p. 4 <https://www.ippr.org/files/2021-02/skills-for-a-green-recovery-feb2021.pdf>

34 CCC, The Sixth Carbon Budget: The UK’s path to net zero (2020) p. 289 <https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf>

35 HPA, Delivering Net Zero: A roadmap for the role of heat pumps (2019) p. 19 <https://www.heatpumps.org.uk/wp-content/uploads/2019/11/A-Roadmap-for-the-Role-of-Heat-Pumps.pdf>



Only **49%**
of manufacturers
are confident
that the current
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training market
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skills they need
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products in
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sustainable way

Make UK

There are also large green skills gaps within the manufacturing industry. Only 49 per cent of manufacturers are confident that the current education and training market can deliver the skills they need to manufacture goods and products in a more sustainable way.³⁶ Within engineering it is much the same, with 48 per cent electrotechnical and engineering services employers stating there is insufficient training available to enable electricians and other installers to deliver the 'active' green technologies necessary to achieve net zero carbon emissions.³⁷

Skills gaps in the engineering sector are also negatively impacting the transport sector's transition to net zero. Research by the Electrotechnical Skills Partnership (ESP) estimated that an additional 8,500-10,000 electricians and 4,000-5,000 new apprentices would be needed over the next five years to meet forecasted economic growth and sector expansion in electrification.³⁸ The report also notes that "there is some concern that the UK currently lacks the capacity to cope with the volume of demand" that will emerge from new technologies such as solar power, associated battery systems and electric charging and the infrastructure to deal with it.³⁹

However, within the energy sector, the skills gap is less stark, with much of the existing workforce viewed as having highly transferable skills. For example, within offshore energy, over 90 per cent of the UK's oil and gas workforce have medium to high skills transferability and are seen as well positioned to work in adjacent energy sectors.⁴⁰ Whilst oil and gas operatives may need to receive industry-related training on how to build and operate newer technologies, including CCUS, the underlying foundational skills are currently present within the energy sector.⁴¹

36 Make UK, Sage, Unlocking the skills needed for a digital and green future (2021) p. 12.

37 ECA, Skills4Climate: Industry survey report (2020) p. 20 <https://www.eca.co.uk/CMSPages/GetFile.aspx?guid=5cca8db0-91aa-43bd-a156-63b98dabb269>

38 TESP, Pye Tait Consulting, The Electrotechnical Skills Partnership: Labour market intelligence research p. 5 <https://www.the-esp.org.uk/wp-content/uploads/2019/11/TESP-LMI-Report-2019.pdf>

39 Ibid p.24

40 Robert Gordon University, Energy Transition Institute, UK Offshore Energy Workforce Transferability Review (2021) p. 2 <http://www.rgueti.com/wp-content/uploads/2021/05/workforce-transferability-report.pdf>

41 Element Energy, ECITB, Towards Net Zero: The implications of the transition to net zero emissions for the engineering construction industry (2020) p. 7 <https://www.ecitb.org.uk/wp-content/uploads/2020/03/Net-Zero-Report-Web.pdf>

...bringing together representatives from industry, the skills sector, and other key stakeholders to develop data-driven action to support the delivery of plans for green jobs and skills

Green Jobs Delivery Group

Green skills provision in further education and apprenticeships

In recent years there have been concerns over the extent to which green skills are embedded within further education and apprenticeships. For example, the Environmental Audit Committee has warned that the *“lack of inclusion of environmental sustainability across apprenticeships and T levels represents a missed opportunity for addressing employer green skills gaps by injecting green knowledge and skills directly into the workplace.”*⁴² IPPR have also raised concerns that longstanding underinvestment in further education will continue to hamper industries ability to access the skills they need to transition to net-zero, arguing; *“the education system cannot deliver the level of technical education that the construction sector will need to meet its climate obligations.”*⁴³

The Education and Training Foundation have stated that climate change, green skills and sustainability knowledge and skills are limited in the curriculum as well as in occupational and apprenticeship standards.⁴⁴ Martin Baxter from the IEMA supported this judgement, stating that *“very few apprenticeships are climate enabled in terms of our net zero future”*⁴⁵. The Environmental Audit Committee made a call for sustainability to be *“embedded across all National Curriculum and A Level courses, and a module on sustainability included in every apprenticeship and T Level course”*⁴⁶ in order for the UK to meet the future needs of the green economy.

In April 2022, the Department for Education (DfE) published its strategy for sustainability and climate change for education. This prioritised excellence in education and skills in a changing world, and actions to boost green skills and careers. Key actions include the development of an occupational standard for FE teaching by 2023, explicitly requiring all teachers to integrate sustainability in relation to their subject specialism⁴⁷. The strategy also confirmed the establishment of a Green Jobs Delivery Group, bringing together representatives from industry, the skills sector, and other key stakeholders to develop data-driven action to support the delivery of plans for green jobs and skills.

42 House of Commons Environmental Audit Committee, Green Jobs: Third report of session 2021-22 (2021) p.43 <https://publications.parliament.uk/pa/cm5802/cmselect/cmenvaud/75/75.pdf>

43 O. Watkins, D Hochlaf, Skills for a Green Recovery: A call to action for the UK construction sector (2021) p. 20 <https://www.ippr.org/files/2021-02/skills-for-a-green-recovery-feb2021.pdf>

44 The Education and Training Foundation, Written Evidence Submitted by the Education and Training Foundation (2021) <https://committees.parliament.uk/writtenevidence/21378/html/>

45 House of Commons Environmental Audit Committee, Oral Evidence: Green jobs and the just transition, (2021) <https://committees.parliament.uk/oralevidence/1664/html/>

46 House of Commons Environmental Audit Committee, Green Jobs: Third report of session 2021-22 (2021) p.3 <https://publications.parliament.uk/pa/cm5802/cmselect/cmenvaud/75/75.pdf>

47 Department for Education, Sustainability and Climate Change Strategy (2022) <https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy>

In addition to new actions outlined in DfE's strategy, a range of actions have already been undertaken by the Government to boost the supply of green skills.

The Government's Net Zero Strategy highlighted the importance of growing post-16 training programmes in line with the needs of employers in the green economy⁴⁸, and established the Green Advisory Panel, tasked with aligning apprenticeships and T Levels with employers' green skills needs. This panel has since identified 44 apprenticeship standards that support green careers⁴⁹, ranging from Level 2 to Level 7.

Institutes of Technology across England are delivering higher-level technical provision in STEM sectors, including green energy production and sustainable engineering⁵⁰. T Levels that support green careers have also been introduced, with the building services engineering for construction T Level covering housing retrofit and heat pump installation.⁵¹ Skills Bootcamps have also been launched in areas such as home retrofit, solar energy, nuclear energy, and green transport.⁵²

The Skills and Post-16 Education Act also legislated to ensure employer leadership of local skills Local Skills Improvement Plans (LSIPs) have regard to skills needed to help deliver on our net-zero target, adaptation to climate change, and other environmental goals.

Whilst there has been progress in creating the frameworks for green skills to be embedded in technical education within the English skills system there is limited evidence on the overall impact of steps taken so far.

The Scottish Government last year created the role of Minister for Green Skills, Circular Economy, and Biodiversity, granting the minister responsibility to "drive a Green Industrial Strategy". The Scottish Government's approach to boosting the skills needed in a net-zero economy can be found in the Climate Emergency Skills Action Plan 2020-2025, published in by Skills Development Scotland (SDS) in December 2020. This includes measures to build evidence on the skills Scotland

48 HM Government, Net Zero Strategy: Build back greener (2021) p. 229 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

49 GAAP, GAAP Endorsed Existing Apprenticeship Standards (2021) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001919/GAAP_endorsed_apprenticeship_standards.pdf

50 HM Government, Net Zero Strategy: Build back greener (2021) p. 247 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

51 Ibid, p.246.

52 Department for Education, List of Skills Bootcamps <https://www.gov.uk/government/publications/find-a-skills-bootcamp/list-of-skills-bootcamps>

The Green Growth Strategy identifies the importance of green skills in allowing green innovations to flourish

The Green Growth Strategy

of Initial Teacher Education, and continued Professional Learning, to ensure the FE sector has the expertise to create the skilled green workforce of the future. Funding has also been extended for the Flexible Skills Programme, focused, amongst other aims, on upskilling of existing workforces in industries needing to decarbonise.

The Northern Ireland Executive has published several strategies recognising the importance of skills in the net-zero transition. The Green Growth Strategy identifies the importance of green skills in allowing green innovations⁵⁸ to flourish and commits the government to partner with industry to ensure Northern Ireland can build the education and training pathways required. The Skills Strategy for Northern Ireland also links green skills to innovation, FDI and exports, identifying 'zero carbon tech' as an enabling technology for Northern Ireland's strong manufacturing base to evolve into global markets⁵⁹. The Energy Strategy for Northern Ireland commits the government to take forward projects to build skills for the roll out of low carbon heat⁶⁰. However, there is little detail on how far these ambitions have translated into concrete action, or the extent of progress in ensuring education and training pathways equip people and businesses with the skills to combat climate change.

As part of this evidence review, L&W aimed to explore how many learners are enrolled in green skills courses. However, this data is not yet available. As our understanding of green skills grows, and action is taken to reflect employer demand for these skills in qualifications and apprenticeships, enrolment data could offer valuable insights into whether the skills system is producing the workforce needed for a green economy.

58 Northern Ireland Executive, The Green Growth Strategy (2021), p.53
<https://www.daera-ni.gov.uk/consultations/consultation-draft-green-growth-strategy-northern-ireland>

59 Department for the Economy (NI), A Skills Strategy for Northern Ireland – Skills for a 10x Economy 2021) <https://www.economy-ni.gov.uk/consultations/skills-strategy-northern-ireland-skills-10x-economy>

60 Department for the Economy (NI), Energy Strategy- Path to Net Zero Energy (2021) <https://www.economy-ni.gov.uk/publications/energy-strategy-path-net-zero-energy>



4

Employer and young people surveys

This chapter explains the key findings from our employer and young people surveys, covering employers' demand for green skills and young people's awareness and interest in green skills.

Methodology

Within both the employer and young people surveys, green skills were given the following definition:

Green skills are the skills needed to promote a green economic recovery focused on reducing UK carbon emissions. This can range from technical green skills such as those relating to construction, engineering or manufacturing, to more general green skills such as project management, change management, leadership, education management and communication skills.



Employer survey

The employer survey took place online, conducted by YouGov. This survey was completed by 1,001 employers. These employers were part of YouGov's Human Resources (HR) omnibus panel, with all individuals surveyed being senior HR decision makers. The survey took place between the 3rd – 17th February 2022. The survey covered employers' attitudes to climate change, the importance of green skills, employers' green skills needs and green skills gaps within their organisations.

The data has been analysed by various business demographics, including business size, sector, and region. Analysis based on business size refers to small, medium, and large employers. For the purposes of this report, small employers are defined as those consisting of 10-49 employees, medium employers are organisations of 50-249 employees and large employers are those consisting of 250 or more employees. All differences reported in the findings are statistically significant at the five per cent level.

A full breakdown of the employer demographics is included in the annex.

Young people survey

The young people survey took place online and was conducted by YouthSight. The survey was completed by 1,162 young people aged 16-24 in the UK. The survey took place between 28th January – 1st February 2022. The survey covered young people's awareness of green skills, young people's interest in pursuing a green career and young people's knowledge of green careers and their barriers.

The data has been analysed by various individual demographics, including gender, age, ethnicity, region and education status. All differences reported in the findings are statistically significant at the five per cent level.

A full breakdown of the employer demographics is included in the annex.

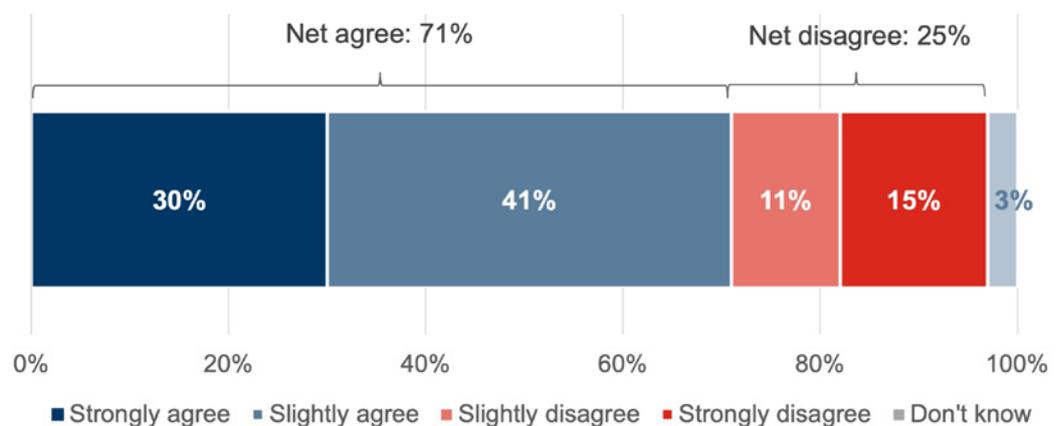


Employer survey findings

Employers' attitude to climate change

Most employers surveyed agree that their organisation has a responsibility to tackle climate change and support the UK to achieve its net zero emissions target (71 per cent), with 30 per cent strongly agreeing.

Figure 1: Organisations' responsibility to tackle climate change⁶¹



Source: YouGov employer survey, 2022. Base: All respondents (1,001)

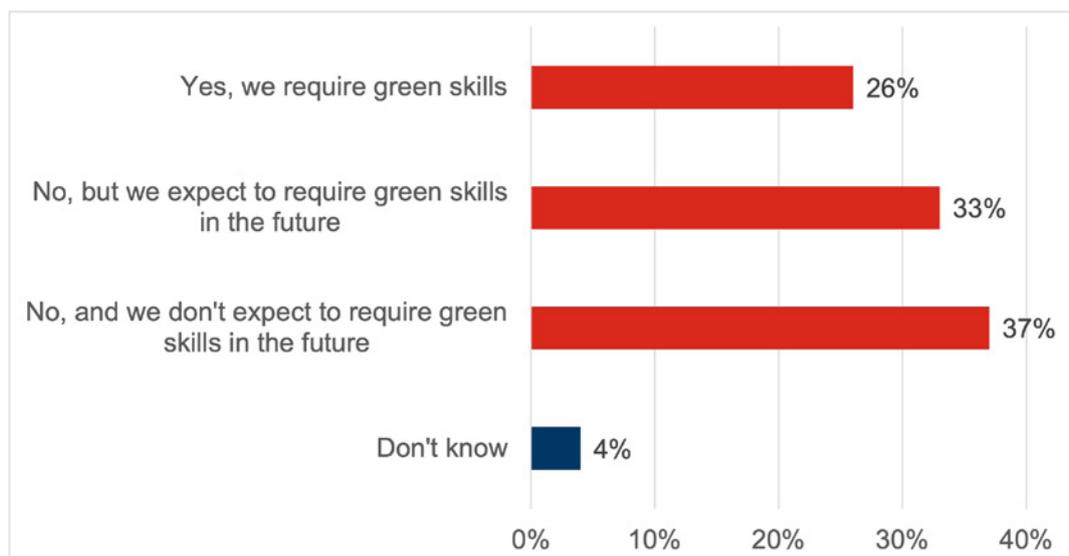
Large organisations (79 per cent) are more likely to strongly or slightly agree, compared with 72 per cent of medium sized organisations and two thirds (66 per cent) of small employers.

Employers' need for green skills

Most employers either currently require green skills (26 per cent) or expect to in the future (33 per cent). Over a third, however, do not currently require green skills, nor expect to in the future (37 per cent).

⁶¹ Due to rounding, the figure for 'Net disagree' adds up to 25 per cent.

Figure 2: Employers' need for green skills



Source: YouGov employer survey, 2022. Base: All respondents (1,001)

Organisations within the IT & telecoms sector (40 per cent) were the most likely to currently require green skills, compared to the average (26 per cent).

Across all sectors, large organisations (34 per cent) were more likely to say that they require green skills. In comparison, small organisations (46 per cent) were more likely to say that they do not require green skills and do not expect to in the future.

Employers were also asked about the proportion of their roles that currently require green skills, and the proportion of roles that will need green skills in the future. The data shows that **employers who currently require green skills, need these for a higher proportion of roles, compared to those who expect to require green skills in the future.**

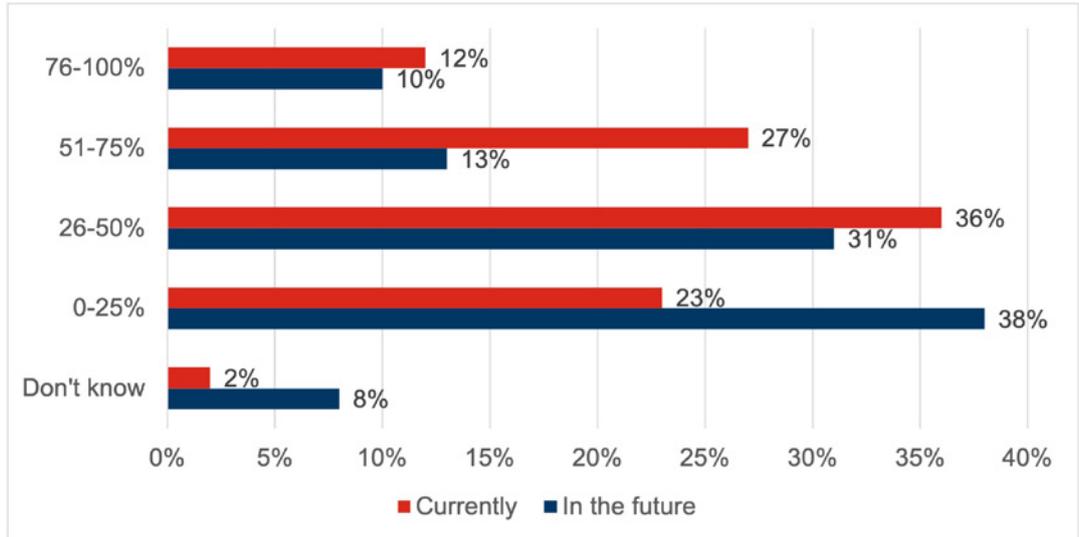
Amongst the employers who said they currently require green skills:

- Just under a quarter (23 per cent) said they need them for 0-25 per cent of their roles
- 36 per cent said they need them for 26-50 per cent
- 27 per cent said they need them for 51-75 per cent
- Just over one in 10 (12 per cent) stated they needed them for 76-100 per cent

Amongst the employers who said they do not require green skills but expect to in the future:

- 38 per cent said they expect to need them for 0-25 per cent of their roles
- 31 per cent said they expect to need them for 26-50 per cent
- 13 per cent said they expect to need them for 51-75 per cent
- 10 per cent said they expect to need them for 76-100 per cent

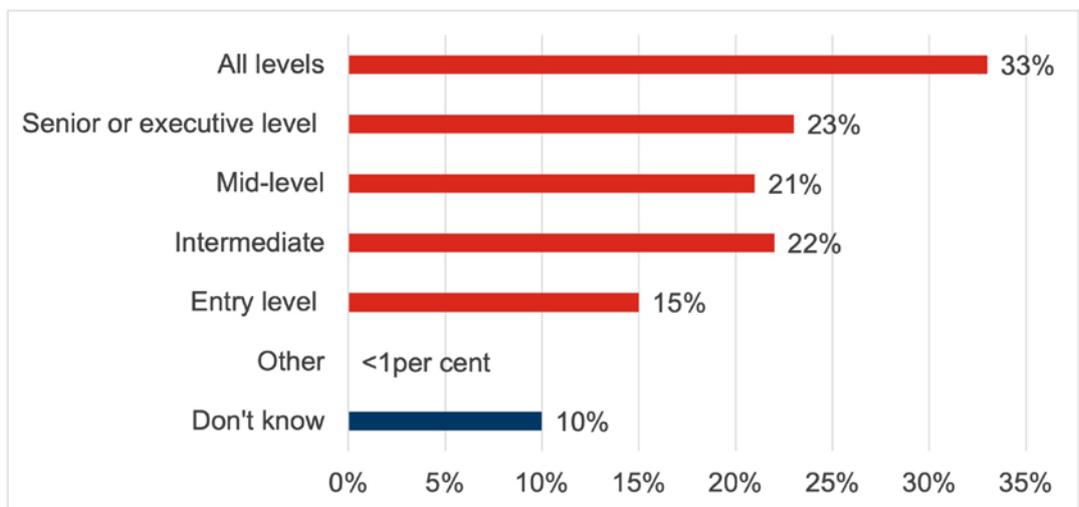
Figure 3: Proportion of roles employers require green skills for, both now and in the future



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills (256); employers who expect to require green skills in the future (333)

One third of all employers who currently require or expect to require employees with green skills (33 per cent) state that they need this for all levels of seniority. Small organisations (20 per cent) were significantly more likely than the average (15 per cent) to say that they require green skills in entry level roles. Large employers (28 per cent), however, are more likely than average (21 per cent) to say they require green skills in mid-level roles.

Figure 4: The career levels employers need green skills for

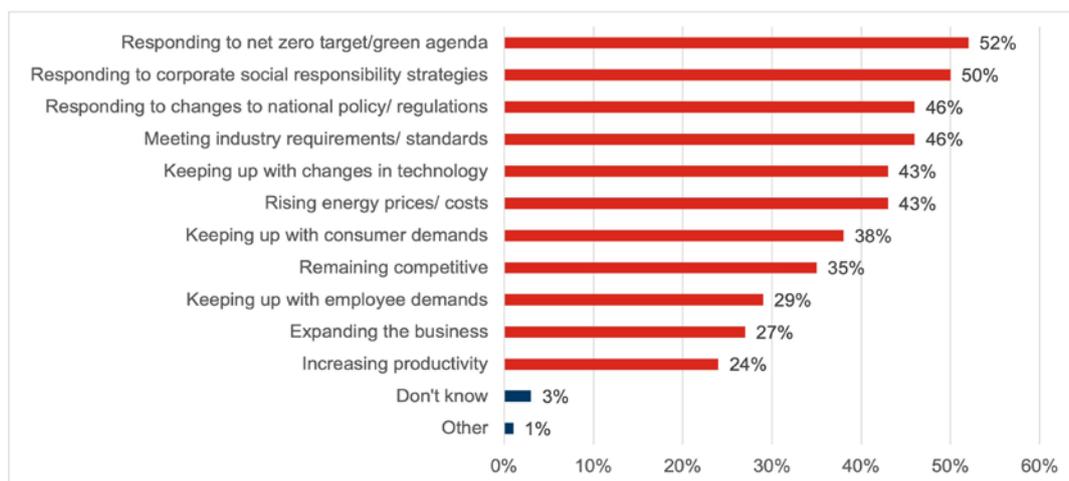


Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future (589)

Employers that currently or expect to require green skills were asked what **factors have created, or will create, a need for green skills** within their organisation. Responding to **the net zero target** (52 per cent) or **corporate social responsibility**

strategies (50 per cent) were the most cited, closely followed by changes to national policy regulations and meeting industry standards/requirements (both 46 per cent). The immediate pressure of rising energy costs and keeping up with changes in technology were also referenced by 43 per cent of firms.

Figure 5: Factors creating a need for green skills



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future (589)

Large organisations are more likely to state that the following factors are contributing to their need for green skills:

- Responding to corporate social responsibility strategies (57 per cent, compared to the average, 50 per cent)
- Remaining competitive (42 per cent, compared to the average, 35 per cent)
- Keeping up with employee demands (38 per cent, compared to the average, 29 per cent)
- Expanding the business (33 per cent, compared to the average, 27 per cent)
- Increasing productivity (30 per cent, compared to the average, 24 per cent).

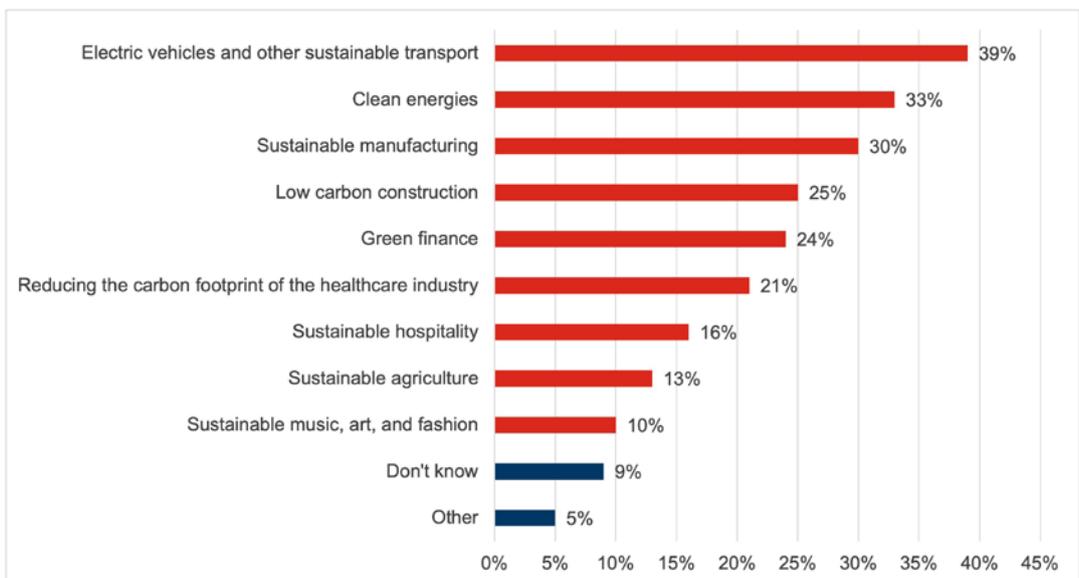
Organisations within the manufacturing sector were significantly more likely than average to say the following factors were creating a need for green skills:

- Responding to corporate social responsibility strategies (63 per cent, compared to the average, 50 per cent)
- Responding to changes to national policy/regulations (62 per cent, compared to the average, 46 per cent)
- Rising energy prices/costs (56 per cent, compared to the average, 43 per cent)

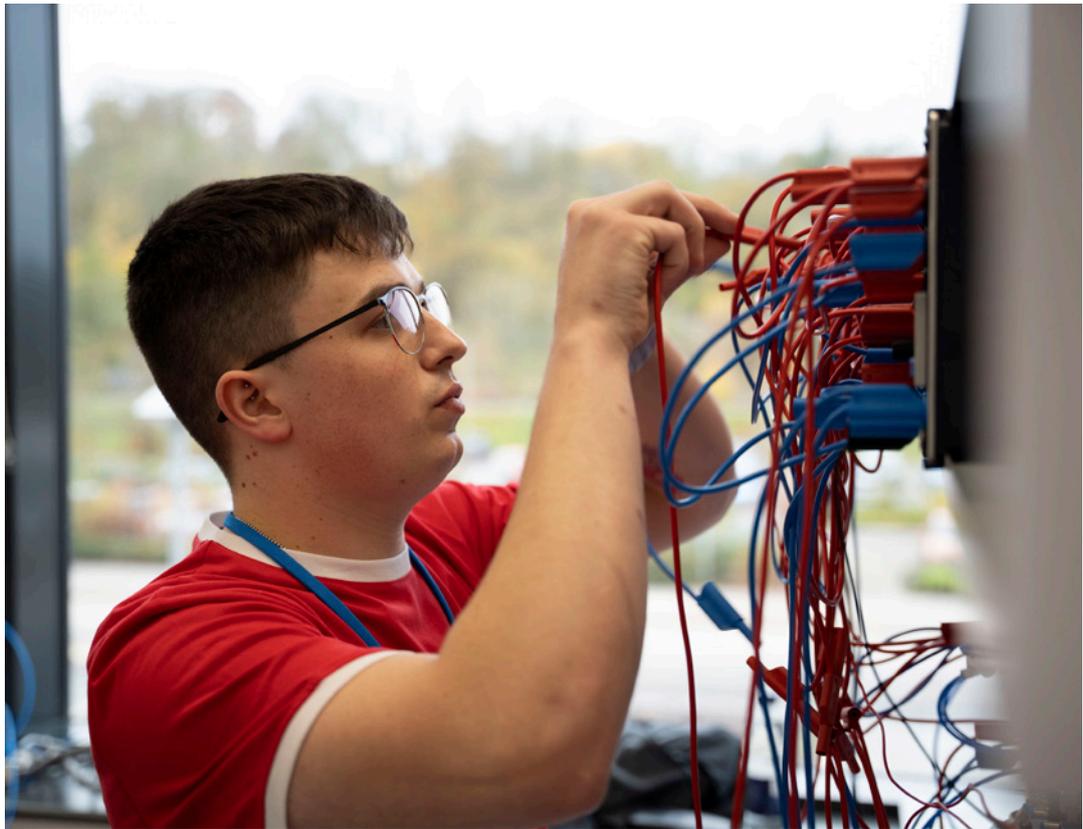


Figure six shows the business areas that employers need green skills for. The data illustrates that **green skills are needed in a range of industries**, most commonly electric vehicles and other sustainable transport (39 per cent), clean energies (33 per cent) and sustainable manufacturing (30 per cent).

Figure 6: The business areas that employers require green skills for



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future (589)



Omron demonstrate the importance of skills to green innovations, and how FDI can accelerate the UK's transition to net-zero

Omron is a large Japanese-owned manufacturing company dedicated to improving lives through innovation. Omron creates around 300,000 automation products, ranging from small electrical components for control panels to robots.

As a foreign owned company operating in the UK, Omron is playing a major role in helping other industries to decarbonise and reduce the environmental load of their manufacturing processes. For example, Omron's technologies are being used in vertical farming to reduce food waste and air miles from farm to fork. Omron is also working with pharmaceutical and food production industries to help them reduce their use of non-recyclable plastic waste through automation and AI-enabled data manipulation.

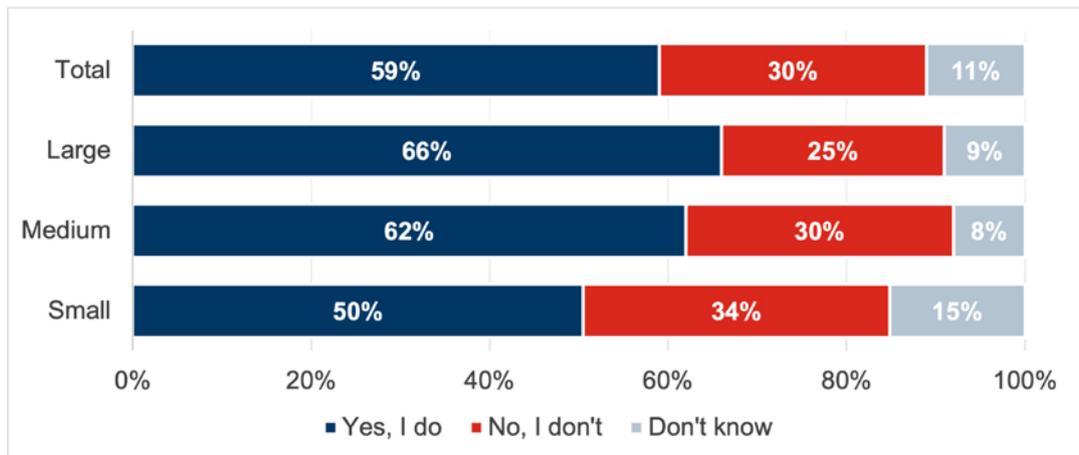
To develop these innovative green AI and robotics solutions, Omron needs people with innovation, engineering, mathematical, and people skills, but faces significant skills shortages. Delivering these skills needed by international firms will be key to attracting greater foreign direct investment to the UK and enabling international firms like Omron to deploy innovative solutions that can support the UK's transition to net-zero.

Employers' green skills gaps

Almost three in five (59 per cent) employers that currently or expect to require green skills feel there are green skills gaps within their organisations. A further 30 per cent do not think these gaps exist and 11 per cent do not know.

Two thirds of large organisations (66 per cent) said their organisation is experiencing green skills gaps, compared to (62 per cent) of medium sized employers, and half (50 per cent) of small firms.

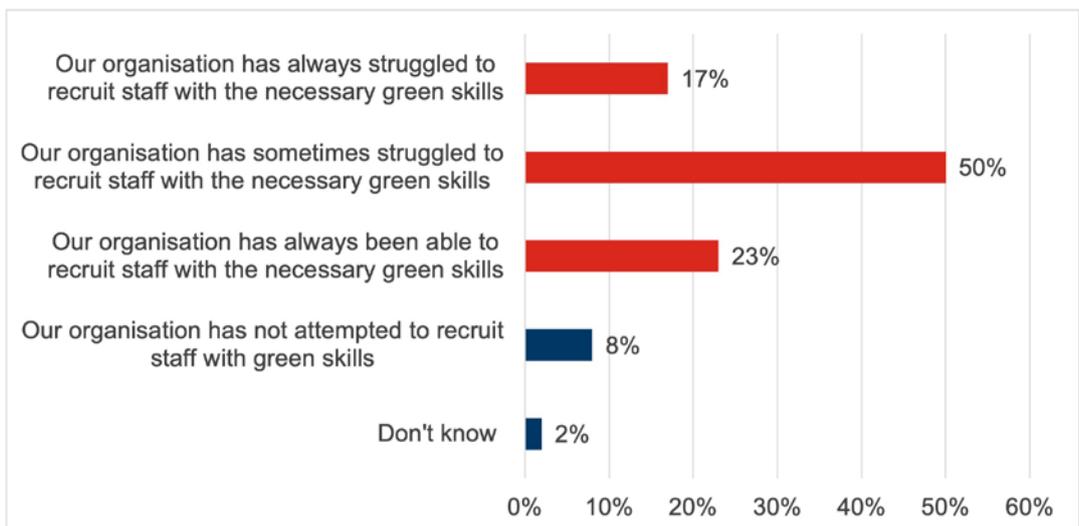
Figure 7: Green skills gaps within the organisation



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future (589)

Figure eight highlights that **over two thirds of firms who currently require green skills (67 per cent) have struggled to recruit staff with these skills** (since February 2020).

Figure 8: Employers' experiences with recruiting staff with the necessary green skills



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills (256)

These **green skills gaps** are having a significant impact upon firms. Most commonly, employers experiencing green skills gaps in their organisation are **struggling to meet net zero targets (29 per cent)** and **struggling to manage rising energy costs (26 per cent)**. One in five (20 per cent) say they are struggling to keep up with the changes in technology and 19 per cent are struggling to remain competitive within their field.

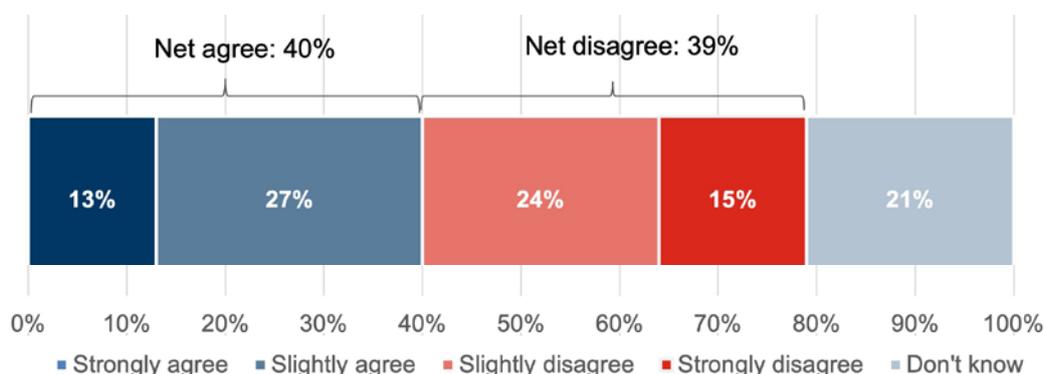
Figure 9: Impact of green skills gaps



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future and notice a green skills gap in their organisation (347)

Employers were equally split on whether young people are coming through the education system with the necessary green skills to support the UK to reach its net-zero target. Thirteen per cent of organisations strongly agreed that the system is equipping young people with the necessary skills and 27 per cent slightly agreed. Comparatively, 15 per cent strongly disagreed with this statement and 24 per cent of employers slightly disagreed. Twenty-one per cent said they do not know.

Figure 10: Agreement with whether young people are coming through the education system with the necessary green skills



Source: YouGov employer survey, 2022. Base: All respondents (1,001)

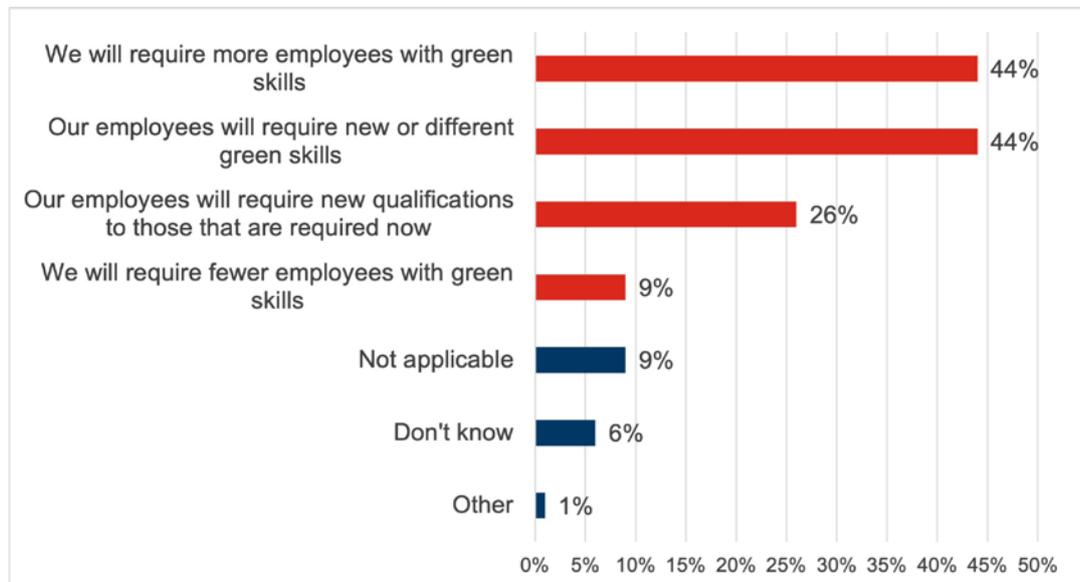
Agreement with this varied by employer size. Large employers (53 per cent) were more likely than average (40 per cent) to agree that young people are coming through the education system with the necessary green skills. Whereas small employers were less likely than average to agree (31 per cent).

Organisations within the IT & telecoms (53 per cent) work industry were significantly more likely than the average to either strongly or slightly agree that young people are coming through the educational system with the skills needed to support the UK's net zero emissions target.

Employers based in London (48 per cent) were significantly more likely than the average to either strongly or slightly agree that young people are coming through the education system with these necessary green skills. The same applies to employers who currently require green skills (67 per cent, compared to the average, 40 per cent).

More than two in five employers that currently or expect to require green skills expect that over the next five years, they will require more employees with green skills (44 per cent), and employees will need new or different green skills (44 per cent). Further to this, 26 per cent said they feel their employees will require new qualifications to those that are required now. Just nine per cent said they will require fewer employees with green skills.

Figure 11: Changes to green skills needs over the next five years



Source: YouGov employer survey, 2022. Base: Employers who currently require green skills or expect to in the future (589)

Large organisations (51 per cent) were significantly more likely than the total (44 per cent) to say that their employees will require new or different green skills. Small employers (38 per cent) were significantly less likely than the average (44 per cent) to say that they will require more employees with green skills.

Employers within the finance and accounting sector (56 per cent) were more likely than average (44 per cent) to state that their employees will require new or different green skills.



Energy Skills Partnership working to secure bright future for offshore wind in Scotland

Energy Skills Partnership (ESP) is a collaboration of Scotland's colleges and industry partners established to increase delivery of green skills needed across energy, engineering, and construction sectors.

The partnership is working to align skills supply with 17 new offshore wind projects approved for development in Scotland over the next ten years. ESP has identified that a breadth of skills needed across the full range of levels, including higher level environmental, consenting and design skills in the early stages, and then fabrication welding, construction and operations and maintenance skills.

To realise the enormous opportunities for jobs, skills and investment in offshore wind, ESP note that significant challenges need to be overcome. For example, many more trainers are required to deliver the volume of training the industry needs, but colleges have insufficient financial bandwidth to take on and train new staff.

Meanwhile, fabrication welding skills will be vital in the manufacturing phase, but these skills have been in significant decline in Scotland over the last 30 to 40 years, with colleges now lacking the facilities to meet this level of demand.

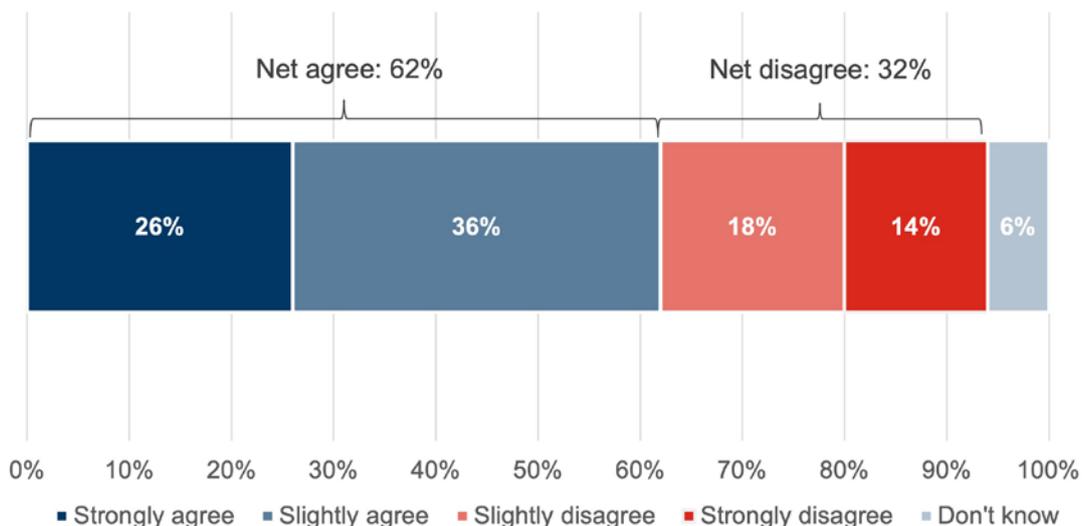
ESP are working with Government and agencies under the Climate Emergency Skills Action Plan and the Scottish Offshore Wind Energy Council on an investment proposal.

As the interface between colleges, industry and government, ESP is well placed to develop solutions to these challenges and help ensure Scotland has the capacity to deliver the right green skills in the right places, at the right time.

The importance of corporate sustainability strategies

Almost two-thirds of employers (62 per cent) agree that having a corporate sustainability strategy is important in attracting young people to work for their organisation, with more than a quarter (26%) strongly agreeing. Just over three quarters of large employers (76 per cent) agreed, compared to half (50 per cent) of smaller employers.

Figure 12: The importance of a corporate sustainability strategy in attracting young people



Source: YouGov employer survey, 2022. Base: All respondents (1,001)

Compared to the average, those from the finance and accounting and IT and telecoms sectors were more likely to agree that a corporate sustainability strategy is important in attracting young people to work for their organisation (both 74 per cent).



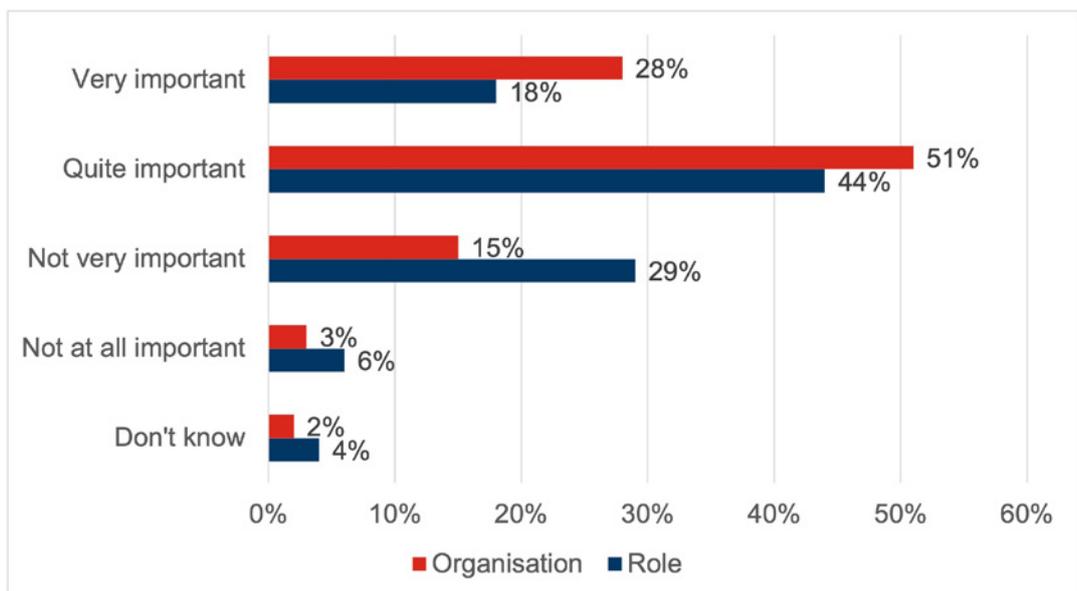
Young people survey

The survey covered young people's awareness of green skills, young people's interest in pursuing a green career and young people's knowledge of green careers and their barriers. The survey was completed by 1,162 young people aged 16-24 in the UK.

Young people's interest in pursuing a green career

In terms of career aspirations, **four out of five young people surveyed (80 per cent) said it was very (28 per cent) or quite (51 per cent) important that they work for an organisation that is committed to tackling climate change.** Nearly two thirds of young people (61 per cent) also wanted to work in a role committed to tackling climate change.

Figure 13: Importance of working in an organisation or role committed to tackling climate change



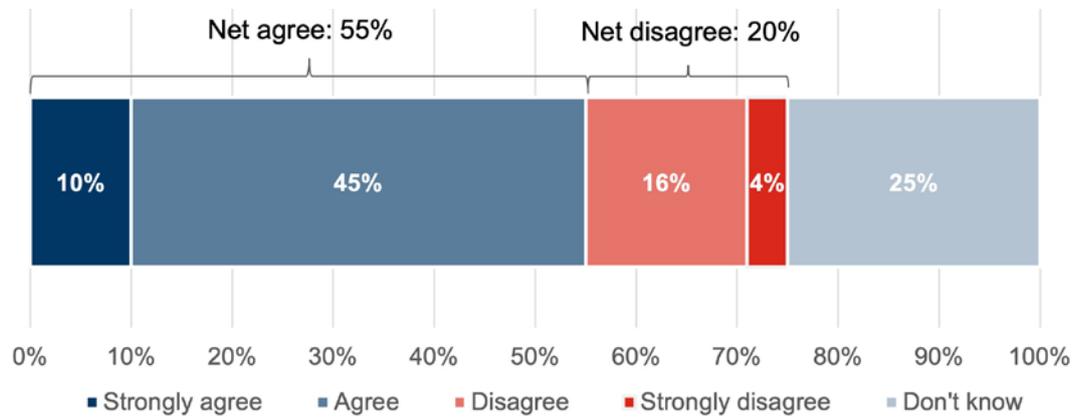
Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Women (83 per cent) were significantly more likely than men (77 per cent) to say that it is important that they work for an organisation that is committed to tackling climate change.

Young people still in education (83 per cent) were more likely than those not in education (77 per cent) to say it was either very or quite important that they work for an organisation committed to tackling climate change.

Over half of young people (55 per cent) agreed that they felt inspired to develop green skills and pursue a green career, with 10 per cent strongly agreeing and 45 per cent agreeing. Only four per cent strongly disagreed.

Figure 14: The extent to which young people feel inspired to develop green skills and pursue a green career



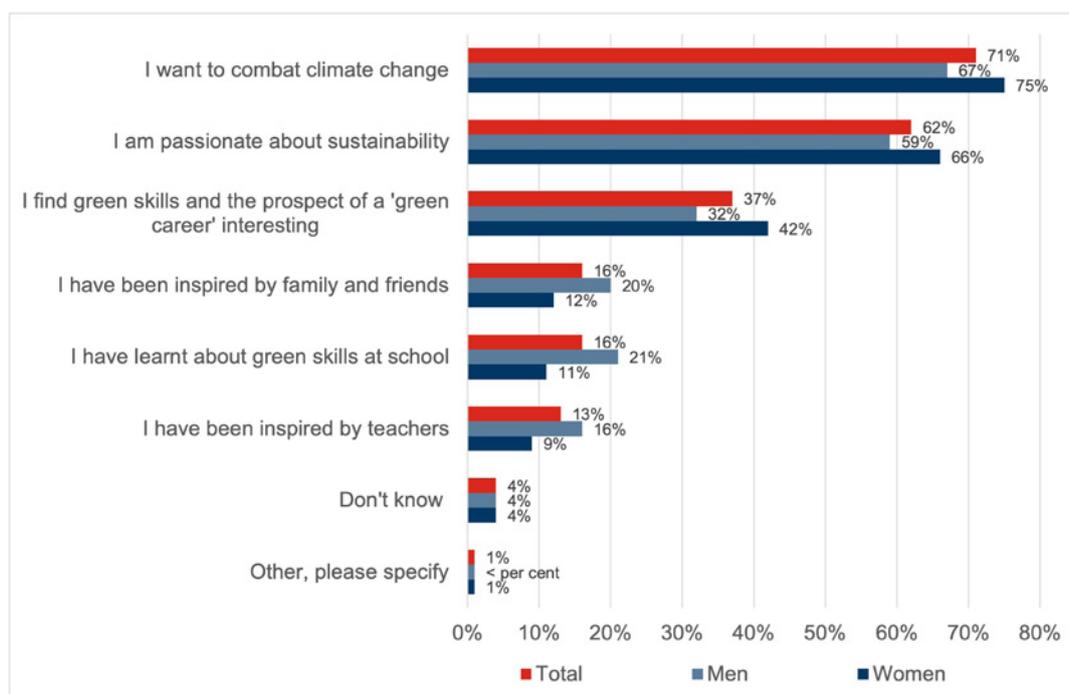
Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Amongst those who said they feel inspired to pursue a 'green career', seven in 10 (71 per cent) said this was because they want to combat climate change. In addition, nearly two thirds (62 per cent) said it was due to a passion for sustainability and a further 37 per cent said it was because they found green skills and the prospect of pursuing a green career interesting. Sixteen per cent said it was due to being inspired by family and friends.



The survey suggests that educators and the skills system are not developing young people’s understanding of green careers, nor acting as the source of their inspiration for a job that combats climate change. Less than one in five (16 per cent) said they want to pursue a green career having learnt about green skills at school or college, and even fewer (13 per cent) said they have been inspired by their teachers.

Figure 15: Reasons for pursuing a green career



Source: YouthSight young people survey, 2022. Base: Young people that feel inspired to pursue a green career (638)

There are also gender differences in young people’s motivations for pursuing a green career. Women were significantly more likely than men to say that:

- They want to combat climate change (75 per cent of women compared to 67 per cent of men)
- They find green skills and the prospect of a green career interesting (42 per cent of women compared to 32 per cent of men).

Men were significantly more likely than women to say that:

- They had learnt about green skills at school/college (21 per cent of men compared to 11 per cent of women)
- They had been inspired by family and friends (20 per cent of men compared to 12 per cent of women)
- They had been inspired by teachers (16 per cent of men compared to nine per cent of women).



Institute for the Motor Industry identify Equity, Diversity, and Inclusion as key to meeting green skills demand in the automotive sector

The Institute for the Motor Industry (IMI) is a professional body for people working in the automotive industry, as well as an awarding body. With the ending of new diesel and petrol car sales from 2030, IMI is working hard to ensure that employers can access diverse talent to create green jobs, and ensure relevant qualifications provide high standards in green skills development.

Forecasting completed by IMI indicates that there will be a significant shortfall of qualified Electric Vehicle (EV) technicians by 2027 as consumer demand and government targets drive up purchases of EVs. There are serious risks associated with not having enough technicians to safely service, maintain and repair EVs, including potential health and safety concerns and a loss of consumer confidence. The automotive industry finds it challenging to fill technician posts, in part due to its reputation as a male-dominated field suitable only for those without an established academic record – a myth that needs to be dispelled.

In response, IMI is making a concerted effort to make the industry more attractive to a range of individuals and capitalise upon appetite across society for green jobs and careers. This includes a recent [report](#) providing thought leadership to the industry, and clear actions that employers can take immediately.

IMI has designed the TechSafe™ standard to recognise technicians working with these new technologies. It has also recently developed a new National Occupational Standard focused on hydrogen fuel cell systems, including how to remove components and diagnose issues with systems, and another focused on dismantling and disposal of End-of-Life Vehicles. These have attracted interest from several countries also wrestling with the transition to electric and hydrogen vehicles and can help ensure the UK motor industry benefits from excellence in green skills development.

“The sector faces its biggest skills challenge in the past two decades. With currently a record number of vacancies across the sector and the task to meet the new skills required to meet the green agenda it certainly is a challenging time. Creating a more diverse and inclusive workforce is one way to tackle this issue as well as providing the support and training to equip the workforce to deliver the Government’s climate commitments”.

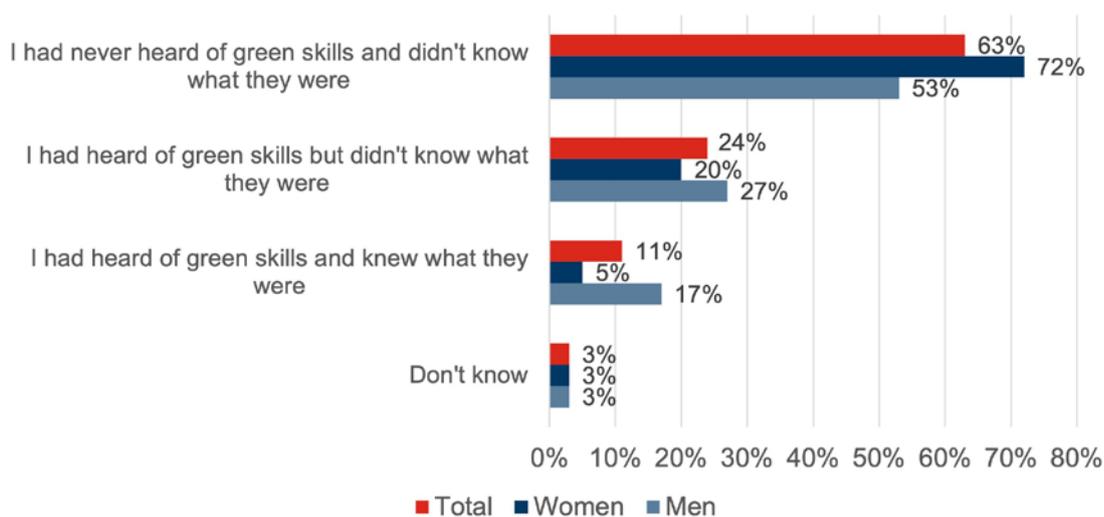
Emma Carrigy, Research and Insight Manager, IMI

Young people's barriers to green careers and the support required

The results of the survey suggest that **young people's awareness and knowledge of green skills is low**, as the majority, 63 per cent, said that they had never heard of green skills and do not know what they are. Twenty-four per cent had heard of green skills but do not know what they are. Only 11 per cent had heard of green skills and know what they are.

There is a **significant gender gap in young people's knowledge and understanding of green skills**, with women (72 per cent), being more likely to say that they have never heard of green skills before and do not know what they are, compared to men (53 per cent).

Figure 16: Awareness of green skills



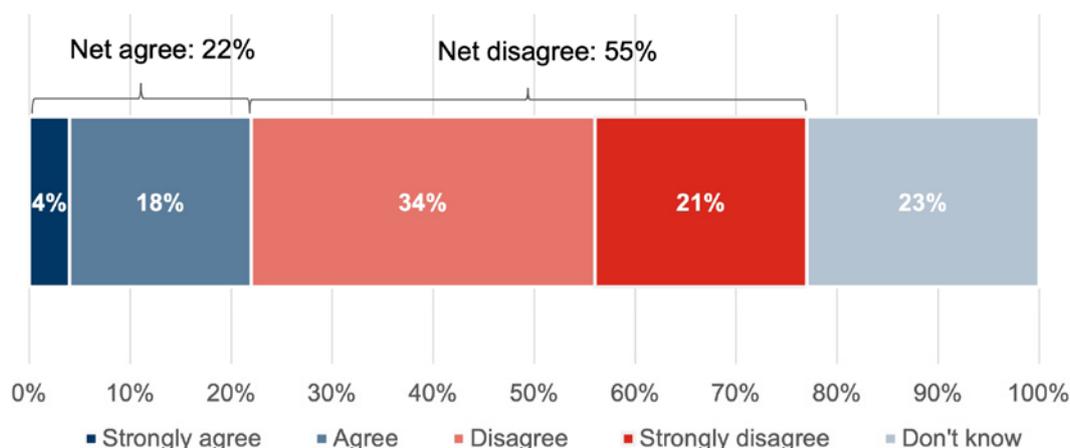
Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Young people based in the South West were more likely than average (63 per cent) to say that they had never heard of green skills and didn't know what they were (75 per cent).

Most young people (55 per cent) strongly disagreed or disagreed with the statement 'I know what green skills employers require within the current labour market'.

Whereas just over one in five (22 per cent) either strongly agreed or agreed with this.

Figure 17: Young people's agreement with the statement 'I know what green skills employers require within the current labour market'



Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

There is a gender gap in young people's understanding of employers' green skills requirements, with men significantly more likely (31 per cent) than women (13 per cent) to strongly agree or agree that they know the green skills that employers need.

Young people in education (25 per cent) were more likely than those out of education (20 per cent) to either strongly agree or agree that they know the green skills employers require within the current labour market.

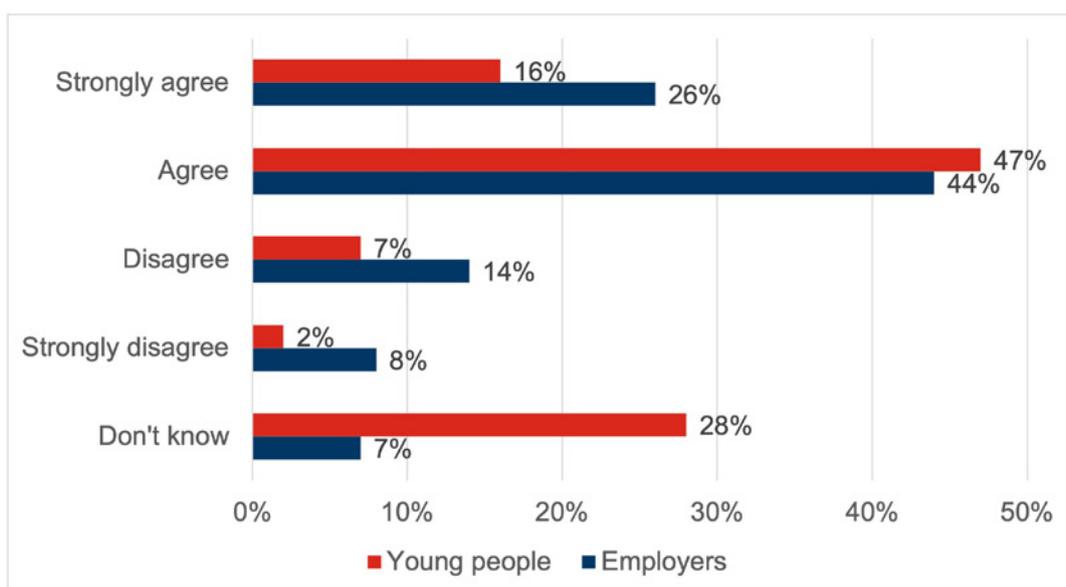
Young people aged between 16-17 (17 per cent) were also significantly less likely than average (22 per cent) to either strongly agree or agree with this statement.

Young people based in London (34 per cent) were more likely than average (22 per cent) to agree or disagree with this statement, and those based in the South East (15 per cent) were less likely than average to say the same.

Both in the employer and young people survey, respondents were asked about how essential green skills will be for young people to succeed in the labour market, and most employers and young people are in agreement that these skills will be essential. **Seven in 10 employers (71 per cent) either strongly agreed (26 per cent) or slightly agreed (44 per cent) that green skills will be important for young people's future careers**, whilst just **under two thirds (63 per cent) of young people either strongly agreed (16 per cent) or agreed (47 per cent) with this.**

Notably, almost three in 10 (28 per cent) young people said that they did not know whether green skills will be essential for young people to succeed in the labour market of the future. Less than one in 10 (seven per cent) employers said the same.

Figure 18: Employers' and young people's agreement that green skills will be essential for young people to succeed in the labour market of the future⁶²



Source: YouthSight young people survey 2022. Base: All respondents (1,162); YouGov employer survey 2022. Base: All respondents (1,001)

Young people based in Yorkshire and Humberside (51 per cent) were less likely than average (63 per cent) to agree with this statement.

The most common barriers that prevent young people from pursuing a green career relate to a lack of understanding. As figure 19 below shows, the most common barriers young people face are;

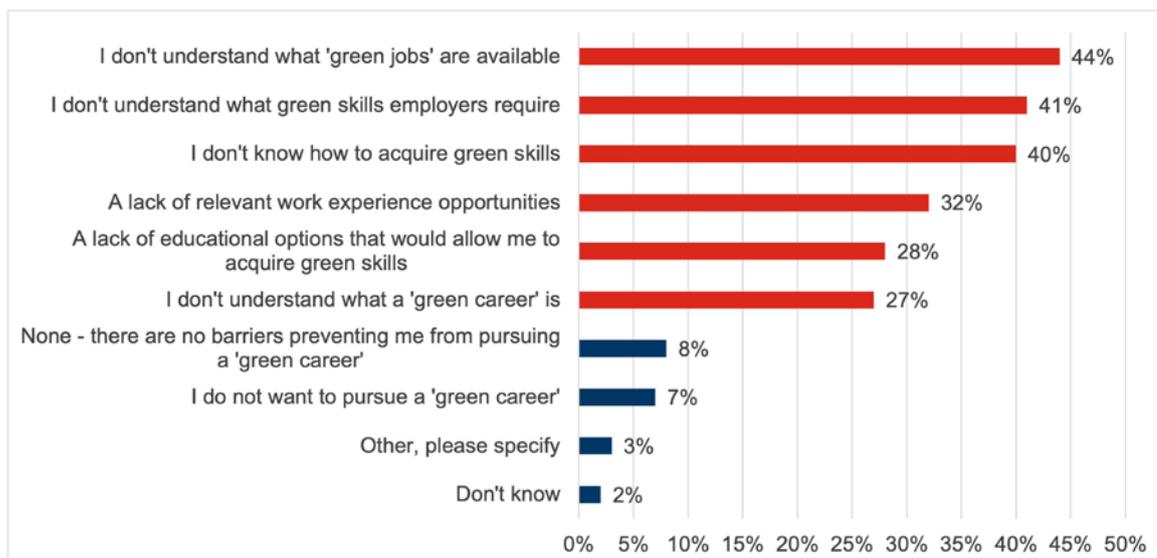
- a lack of understanding of what green jobs are available (44 per cent),
- a lack of understanding of the green skills that employers require (41 per cent)
- a lack of understanding of how to acquire green skills (40 per cent).

In addition, just under one in three (32 per cent) young people said a lack of relevant work experience opportunities was a barrier. Over a quarter cited lack of educational options (28 per cent) or a lack of understanding on what a green career is (27 per cent).

Less than one in 10 (eight per cent) young people said there are no barriers preventing them from pursuing a green career and only seven per cent stated they do not want to pursue a green career.

⁶² Please note that the scale values for the employer and young people surveys differed, with the employer survey using 'slightly agree / slightly disagree' and the young people survey using 'agree / disagree'.

Figure 19: Barriers preventing young people from pursuing a green career



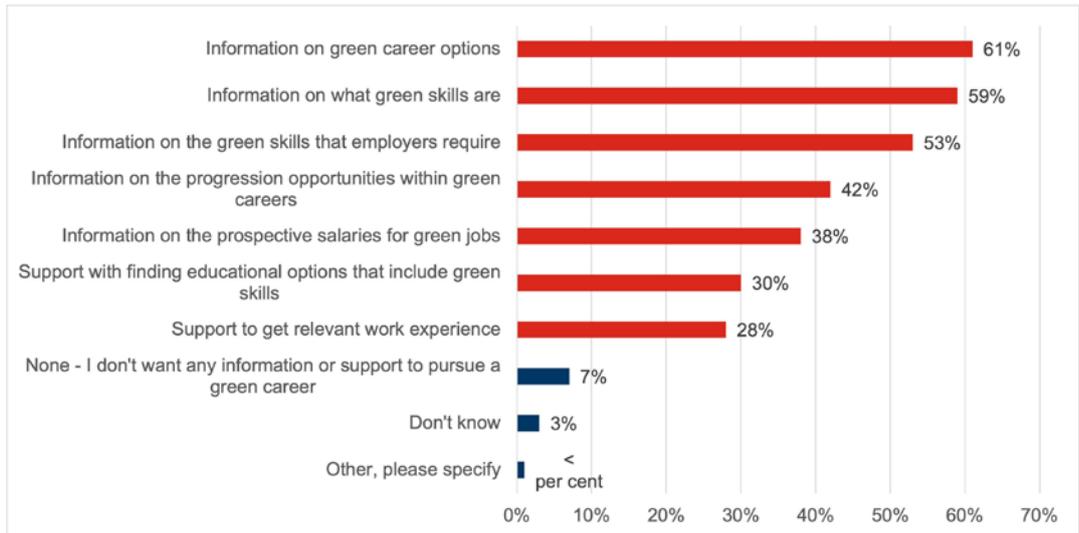
Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Women are significantly more likely than men to cite the following barriers to pursuing a green career:

- I do not understand what green jobs are available (48 per cent of women compared to 40 per cent of men)
- I do not know how to acquire green skills (47 per cent of women compared to 33 per cent of men)
- I do not understand what green skills employers require (44 per cent of women, compared to 38 per cent of men)
- A lack of educational options that would allow me to acquire green skills (31 per cent of women compared to 25 per cent of men).

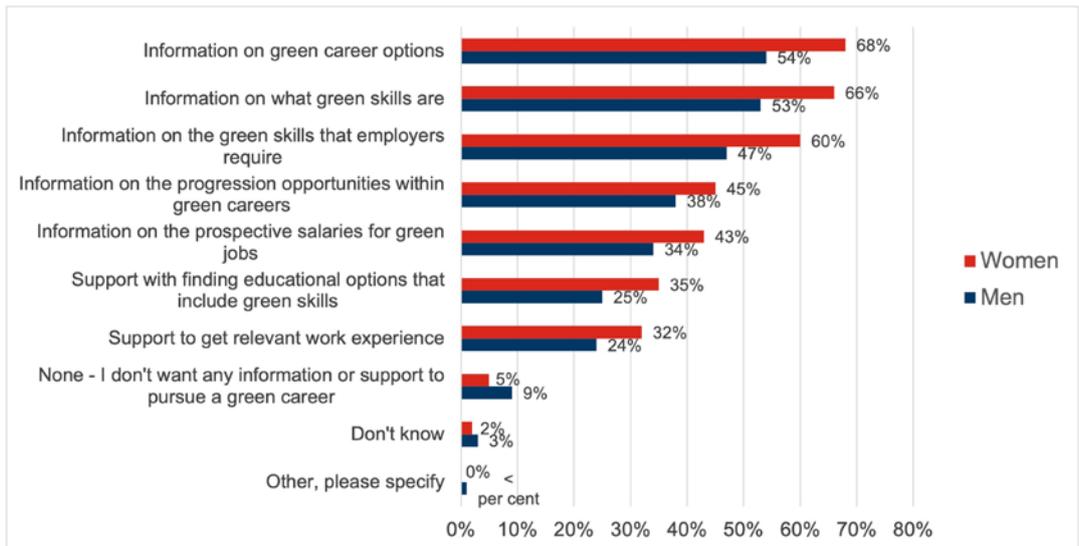
Figure 20 highlights that **providing young people with additional information and support is key to overcoming barriers to pursuing a green career**. Around six in ten young people would find information on green career options (61 per cent) or information on what green skills are (59 per cent) to be most helpful. Just seven per cent said they would like no information or support at all. Figure 21 highlights that **women were significantly more likely to say that they would want all of the support options listed**.

Figure 20: Information and support young people would like to help them pursue a green career



Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Figure 21: Information and support young people would like to pursue, by gender



Source: YouthSight young people survey, 2022. Base: All respondents (1,162)

Partnership between FE and industry paving the way for sustainable construction in Northern Ireland

Southeastern Regional College (SERC) has seized the initiative in supporting sustainable construction by establishing the first multi-faceted zero carbon centre in Northern Ireland. The unique provision incorporating five purpose-built units will be created on site, equipped with innovative green technologies that are expected to significantly contribute to the decarbonisation of commercial and domestic buildings in Northern Ireland.

A wide range of qualifications at various levels will be on offer across five themes: electrification; air source heat pumps and solar thermal; hydrogen domestic boilers; hydrogenated vegetable oil HVO and BioLPG; and air tightness and insulation. The Centre will cater for qualified tradespeople looking to upskill and attain a license to practice for new technologies, non-tradespeople who want to undertake short introductory awards, as well as FE construction students and apprentices.

SERC has worked closely with industry partners throughout the design and planning phase to ensure that the new centre meets industry standards and needs. The College has secured sponsorship from employers, including Greenview Energy Solutions, a company that installs, maintains, and repairs renewable energy systems. Greenview have contributed their products to enable hands on experiential learning and will sponsor the electrification unit, assisting with the installation of technologies on site.

Once courses start, Greenview and other industry experts will provide guest lectures, enabling other businesses to understand and ramp up their efforts to support decarbonisation. The zero-carbon centre is expected to launch in September 2022.

“There are very exciting times ahead with the challenges of decarbonisation within the construction industry. There are opportunities for companies and individuals to diversify from traditional work practices to new methods of building processes and products to help reduce the demand on carbon-based fuels and longevity of the whole life cycle of building. This zero carbon centre is a perfect platform to identify best practice methods and zero carbon products, whilst working with leading manufacturers, giving companies the opportunity to choose from a range of carbon reducing installations which are appropriate for either new build or retrofit projects.”

Paul Henry, Lead Business Manager for Construction Services, SERC

“Reducing the carbon footprint of the UK’s buildings and homes represents a significant challenge to achieve a carbon-zero world. With ongoing developments in the sector, we are delighted to support the development of this new zero-carbon centre and our continuing our ongoing collaboration with SERC. As an employer, we continue to invest heavily in our training and apprenticeship programmes to ensure that Greenview as a business can meet the future demands of our clients and their zero-carbon targets to deliver such industry change.”

Roy Connolly, Greenview’s Managing Director – Commercial



5

Key findings and conclusions

The net zero target, corporate social responsibility strategies, and changes to national policy regulations are driving clear demand for green skills among employers.

Summary of key findings

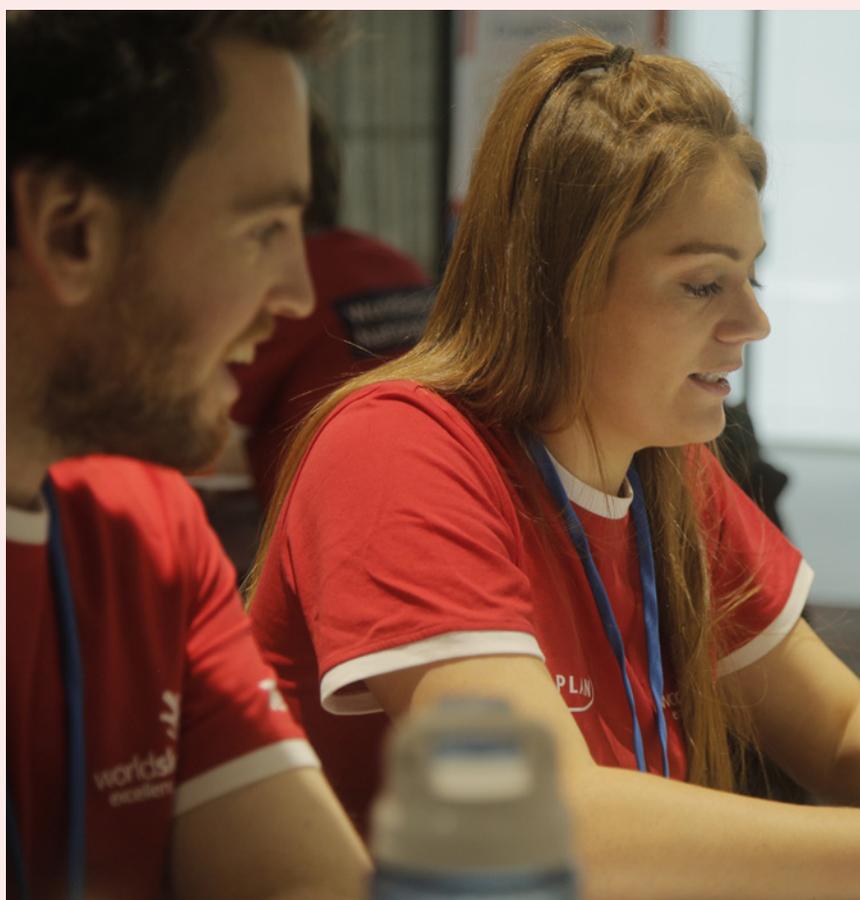
Most employers surveyed believe that their organisation has a responsibility to tackle climate change and help the UK meet its net zero emissions target, particularly large organisations. The majority either currently require green skills or expect to in the future. Green skills are needed across all levels and across a range of industries – and this is supported by the evidence review. Electric vehicles, clean energies and sustainable manufacturing are the industries most noted by employers in reference to where green skills are needed. The UK's ability to develop world-class technical skills in these sectors, where global firms are internationally mobile, will be key to attracting foreign direct investment in the jobs needed for net-zero.

The net zero target, corporate social responsibility strategies, and changes to national policy regulations are driving clear demand for green skills among employers. As the survey of young people confirms, sustainability and corporate responsibility strategies will be vital to businesses' ability to attract young people into employment and access and develop their skills. Green skills are needed across all career levels,

and most employers have struggled to recruit candidates with the green skills required. Six in ten employers report that they have a green skills gap. This mirrors wider evidence indicating that the UK is facing a significant shortage of the skills required to meet the UK's net zero targets. This skills gap is having a negative impact on employers' ability reduce emissions and manage rising energy costs.

Most young people surveyed feel inspired to develop the skills needed to pursue a career that supports the objective of reducing emissions and are strongly motivated by a desire to combat climate change. However, young people lack awareness and understanding of 'green skills' and 'green jobs', despite their strong commitment to sustainability. Only a small portion noted being inspired because of information or advice received in an education setting. This aligns with findings that young people lack knowledge and understanding of what green jobs are available, the skills employers require, and how to acquire them. This lack of information and advice is acting as a major barrier to young people fulfilling their aspirations in this area, particularly amongst young women. Women are more likely to say that they would like to work for an organisation dedicated to combatting climate change. However, they are more likely to report a lack of awareness as a barrier preventing them and call for wide ranging information and advice on skills, jobs, and careers that can help the UK reach its net-zero goal.

Most young people surveyed feel inspired to develop the skills needed to pursue a career that supports the objective of reducing emissions and are strongly motivated by a desire to combat climate change





Developing world-class skills for a net-zero economy – the role of WorldSkills UK

WorldSkills UK partnered on this report to understand employer demand for green skills, and young people's understanding of skills, jobs and careers that can support the UK's transition to net-zero carbon emissions. We will use the findings to ensure our programmes help the UK develop world-class skills for a net-zero economy. This is key to attracting greater foreign direct investment in green industries, and delivering great green job opportunities to young people, regardless of gender or background.

1. Empower and inspire young people of all backgrounds to build STEM skills, gain jobs, and pursue careers that will tackle climate change

We will use our careers advocacy programmes and Spotlight Talks to engage and inspire 40,000 young people, showcasing opportunities for green jobs and the skills and training young people need to succeed. This includes sustaining engagement with our recent Spotlight on Green Jobs through a social media campaign, highlighting how jobs across all sectors of the economy can support the UK to tackle climate



change. We will also update our Careers Advice Toolkit to provide information to young people and parents on how technical education and apprenticeship pathways can support access to jobs that will help tackle climate change.

2. Launch a new competition programme in renewable energy

Within the next year, WorldSkills UK will launch a renewable energy competition, enabling young people to develop world-class skills in the installation and maintenance of wind turbines and solar panels. We will also work to ensure UK participation at the inaugural global finals in renewable energy at WorldSkills Lyon 2024.

3. Partner with the Institute for Motor Industry to enhance opportunities for young people to gain green skills in the automotive sector

WorldSkills UK and IMI will seek to capitalise on opportunities to incorporate knowledge and skills for electric vehicle maintenance and repair into existing competition programmes. This includes the option of interlocking accredited green skills development training with existing IMI partnered competition programmes in automotive technology, automotive body repair, and automotive refinishing.

4. Embed green skills in wider skills competition programmes and support for educators

We will work with our Competition Organising Partners across all areas, to see how far they can use green skills in their competition-based training activities. We will integrate green skills within three competition programmes over the next year and establish a 'green advisory group'



to support this work. We will also use the insights from this report to drive international understanding of opportunities for green skills in WorldSkills global standards and competition programmes. This can underpin collaboration to ensure international competition programmes meet the needs of global economies to help reach net-zero.

5. Assist UK skills providers to deliver world-class standards in green skills development

We will connect Institutes of Technology with global leaders in green skills development to boost the sector's capability to deliver high-quality training that supports the creation of green jobs and attracts international investment in the green economy. This includes entrenching and expanding existing International Skills Partnerships that support shared research and investigation, and the exchange of best practice.

6. Work with DfE and IfATE in England and parallel bodies in Scotland, Wales and Northern Ireland , to ensure qualifications and apprenticeships supply green skills that boost UK competitiveness for foreign direct investment

We are committed to using our insights to help all UK governments boost the supply of green skills in globally traded sectors. This can cement the UK's position as a world-class green skills economy and attract significant foreign direct investment in the jobs needed to reach net-zero. We are also working closely with the Education & Training Foundation to enhance professional development courses. This will help ensure educators are equipped to deliver high-quality qualifications enabling businesses and young people to develop world-class green skills.



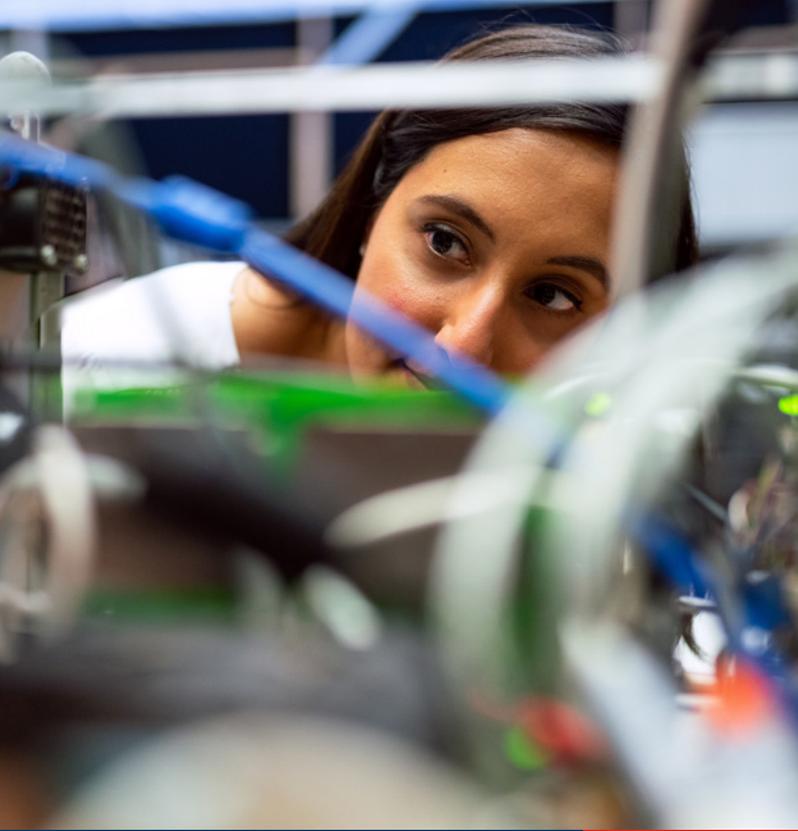
Conclusions for the UK Government

1. Marketing and communications, such as the *Get the Jump* campaign, could capitalise on the enthusiasm of young people to pursue green careers by helping schools, colleges, and universities signpost to education and training pathways available.
2. The independent Green Jobs Delivery Group, IfATE's Green Advisory Panel, and DfE's Unit for Future Skills all have the opportunity to undertake data-driven action to ensure approved qualifications and apprenticeships support up to date skills and jobs businesses across sectors need to decarbonise.
3. DfE's commitment to make qualifications and apprenticeships more flexible could remove barriers for people to acquire new green skills. This could be complemented through the roll-out of Higher Technical Qualifications and the Lifelong Loan Entitlement.
4. Local Skills Improvement Plans offer the opportunity for employers and skills providers to identify and develop world-class skills that boost their region's competitiveness for foreign direct investment in green jobs.
5. Through the Skills Value Chain, the High Value Manufacturing Catapult can continue to close the loop between the development of green technologies and the identification and delivery of higher technical skills businesses need to harness them.



Conclusions for Devolved Administrations

1. The Scottish Government could ensure the National Strategy for Economic Transformation integrates actions from the Climate Emergency Skills Action Plan.
2. Further to the creation of an 'All Energy' apprenticeship pathway, Skills Development Scotland could explore other opportunities for integrated delivery of skills that high-carbon sectors, such as construction, need to transition.
3. Through the new Employability and Skills Action Plan the Welsh Government has the opportunity to raise young people's awareness of green jobs. For example, Careers Wales, through the delivery of their five-year strategic plan Better Futures, could deliver clear actions to raise awareness of green job opportunities for young people.
4. The Welsh Government could use the forthcoming Net Zero Skills Plan to ensure there are clear actions and accountabilities on: defining and delivering upon industry requirements for green skills, developing national occupational standards, stimulating green skills demand, and building on the labour market intelligence of Regional Skills Partnerships to map and forecast green skills demand.
5. The Northern Ireland Executive should ensure actions taken forward under the Skills for a 10x economy strategy provide a framework for the development of skills needed for high quality jobs in a net-zero economy. The Skills Barometer can ensure employer demand for green skills is mapped and delivered upon and enables Invest NI to market Northern Irish green skills to prospective investors.



General conclusions

1. Efforts to attract more women into STEM should point to the importance of STEM skills to net-zero and lever the enthusiasm of young women for green jobs and careers.
2. Highlighting the importance of technical skills to decarbonisation can attract young people to apprenticeships and help build prestige in technical education.
3. As our understanding of green skills grows, and action is taken to reflect employer demand for these skills in qualifications and apprenticeships, enrolment data could offer valuable insights on whether the skills system is producing the workforce needed for a net-zero economy
4. Smaller employers could benefit from additional support to understand which qualifications and courses provide green skills for their sector.
5. Larger employers could have a positive role in helping smaller firms in their supply chain to understand what transition to net-zero looks like, and the green skills required.

6

Annex

Figure 22: Employer demographics

		No.	%	
Organisation size	Small	445	44%	
	Medium	288	29%	
	Large	268	27%	
Work industry (main)	Manufacturing	123	12%	
	Construction	65	6%	
	Retail	62	6%	
	Finance and accounting	121	12%	
	Hospitality and leisure	64	6%	
	Legal	27	3%	
	IT & telecoms	130	13%	
	Media/marketing/ advertising/PR & sales	62	6%	
	Medical & health services	58	6%	
	Education	46	5%	
	Transportation & distribution	59	6%	
	Real estate	24	2%	
	Other	157	16%	
	Region mainly work	North	209	21%
		Midlands	141	14%
East		56	6%	
London		244	24%	
South		247	25%	
Wales		37	4%	
Scotland		59	6%	
Elsewhere (i.e. outside of Great Britain)		8	<1%	

Figure 23: Young people's demographics

		No.	%
Gender	Male	524	45%
	Female	638	55%
Age	16-17	212	18%
	18-21	494	43%
	22-24	456	39%
In/out of education	In education	601	52%
	Out of education	561	48%
Ethnicity (grouped)	White	848	73%
	Black	42	4%
	Asian	189	16%
	Mixed	46	4%
	Other	13	1%
	Prefer not to say	24	2%
Region (grouped)	North England	157	13%
	Yorkshire and Humberside	91	8%
	The Midlands	200	17%
	Eastern	53	5%
	South England	311	26%
	London	232	20%
	Wales	31	3%
	Scotland	68	6%
Northern Ireland	19	2%	
Ethnicity (detailed)	White	848	73%
	Black Caribbean	7	1%
	Black African	34	3%
	Black Other	1	<1%
	Indian	58	5%
	Pakistani	49	4%
	Bangladeshi	25	2%
	Chinese	21	2%
	Other Asian	36	3%
	Mixed	46	4%
	Other	13	1%
	Prefer not to say	24	2%

Figure 23: Young people's demographics (continued)

		No.	%
Region (detailed)	North West	118	10%
	North East	39	3%
	Yorkshire & Humberside	91	8%
	West Midlands	106	9%
	East Midlands	94	8%
	Eastern	53	5%
	South West	109	9%
	South East	202	17%
	London	232	20%
	Wales	31	3%
	Scotland	68	6%
	Northern Ireland	19	2%
Highest level of qualification held	NVQ Level 1, Foundation GNVQ or basic skills qualification	6	1%
	GCSE	179	15%
	A-Levels, Higher School Certificate, Welsh Baccalaureate or advanced diploma	421	36%
	NVQ Level 3, Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma	45	4%
	Degree or higher degree	450	39%
	NVQ Level 4-5, HNC, HND or BTEC Higher Level, RSA Higher Diploma	35	3%
	Apprenticeship	5	<1%
	No qualifications	7	1%
	Other, please specify	6	1%
	Don't know	8	1%
Employment status	Employed, full time (35 hours or more)	348	30%
	Employed, part time (less than 35 hours)	221	19%
	Self-employed	28	2%
	I am completing an apprenticeship	14	1%
	Unemployed and looking for work	79	7%
	Unemployed and not looking for work	42	4%
	In education (including study as part of an apprenticeship)	506	44%
	Other, please specify	11	1%
Educational status (for those in education)	I am studying at school/sixth-form college	177	35%
	I am studying at a further education college	12	2%
	I am studying at a university	313	62%
	I am studying with a private training provider	3	1%
	Other (please specify)	2	<1%

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