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# Green Skills Market Analysis

A report for the West of England Combined Authority



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# Executive Summary

In July 2019, the West of England Combined Authority (WECA) declared a climate emergency, with the aim of transitioning the region to becoming net zero by 2030, 20 years ahead of the UK Government’s target. Meeting net zero will require fundamental shifts across all areas of the economy including transport, power, industry and the natural environment.

In order to drive action towards the region’s 2030 target, the [West of England Climate Emergency Action Plan \(CEAP\)](#) is being implemented across the local economy. The plan sets out five grand challenge areas and subsequent actions to help reduce emissions and work towards carbon neutrality. The plan recognises that ensuring the local workforce have the skills and qualifications required for the jobs of the future will be of profound importance.

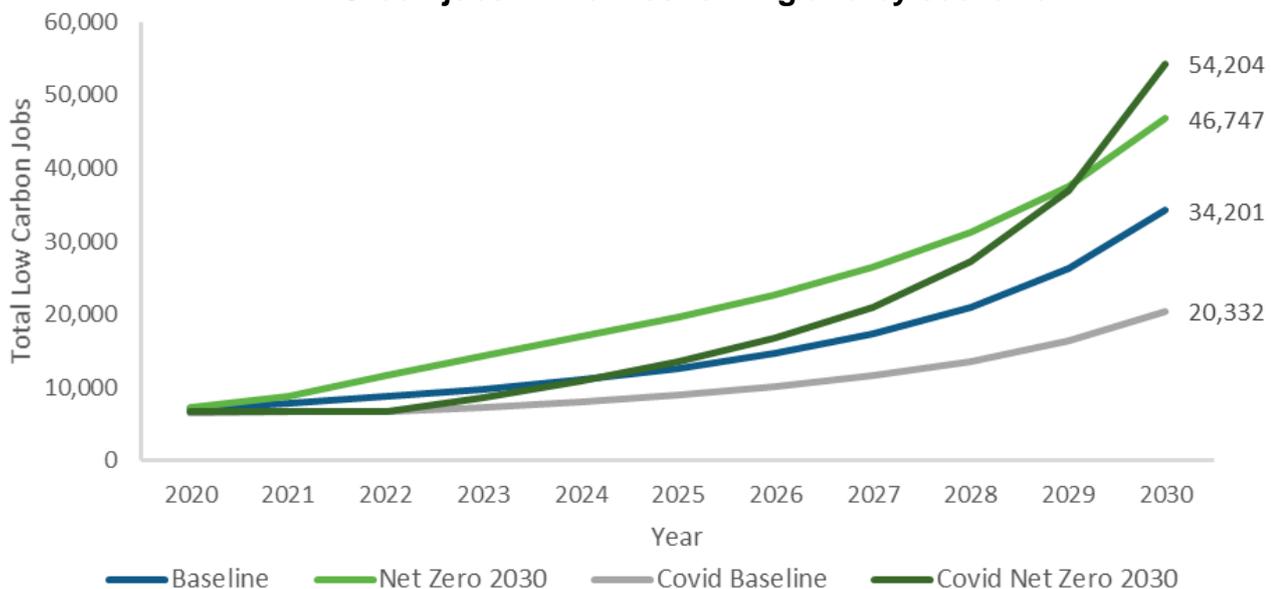
## The provision of a skilled workforce is central to the delivery of net zero

Whilst ambitious targets are key in driving action, these targets cannot be delivered upon without a motivated workforce, equipped with the skills required to tackle climate change. There is a need to both upskill the existing workforce, as part of ensuring a just transition, as well as engage new entrants. Whilst this presents a significant challenge, it also presents a great opportunity. The Covid-19 pandemic and the impact that it has had on both the UK and the region’s employment market creates a further case for change; the pandemic has accelerated the need to support the growth of new ‘green’ sectors and therefore new ‘green’ jobs, whilst enabling existing sectors to transition to low carbon.

## The potential for green job creation is significant

In order to assess the scale of the opportunity, a total of four scenarios were modelled. Under the two modelled scenarios in which WECA meets its net zero target, the number of green jobs totals over 45,000 in 2030, across a range of sectors. In the Baseline and Covid Baseline Scenarios, the net zero target is not met and growth in low carbon jobs is substantially lower.

**Green jobs in the West of England by scenario**



Job growth will include Manufacturing, Construction & Installation and Operation & Maintenance.

1. Manufacturing: Under the net zero 2030 scenarios, manufacturing represents approximately 10% of green jobs. The transition will enable WECA to build on its existing capabilities in advanced manufacturing sectors, as home to one of the largest clusters of composite materials researchers and engineers in the world.
2. Construction & Installation: Under the net zero 2030 scenarios modelled, construction & installation represents 52% of green jobs. This is primarily driven by retrofitting the majority of existing buildings with energy efficiency measures and low carbon heat<sup>1</sup> as well as construction and installation of low carbon electricity generation.
3. Operation & Maintenance: A little under two-fifths (38%) of jobs will be in operations and maintenance to support the transition to net zero and ensure infrastructure is functioning correctly. The vast majority of operations and maintenance jobs under the modelled scenarios are in the low carbon services sector with key areas of growth including low carbon advisory, digital and green finance.

### **Actual growth is dependent upon addressing existing skills gaps and preventing new ones from emerging**

In order to ensure that the potential growth opportunities modelled are unlocked, it is fundamental that existing skills gaps are addressed and that efforts are undertaken to mitigate against new ones emerging. Specific sectors face unique challenges. Interviews with experts in key sectors including Low Carbon Services, Nuclear, Aerospace, Solar PV and Construction were conducted to understand some of the discrete challenges faced, and this research was supported by a desk-based review of the literature. With a shift to an increasingly digitalised economy and the availability of information at the point of use, soft skills are also highly valued across the green economy. These skills include innovation, communication, project management, effective leadership, problem solving and strategic thinking.

### **Training providers face challenges in developing the programmes required**

Exciting developments have been made within the WECA region to address some of the existing emerging skills gaps faced in the region. For example, the West of England Institute of Technology (WEIoT) has been developed to “equip people with the skills to fully participate in, and contribute to, economic growth driven by digital innovation and emerging technologies.” However, there is a clear call for further training provision across the green economy, both within the region and across the UK.

Our conversations with Further Education (FE) colleges and Local Government representatives in the region, indicated that there are challenges faced by Training Providers in developing the training offers called for. One of the key challenges faced by some FE Colleges is the funding model. Funding is predominantly based upon immediate demand. However, the rapidly emerging nature of some sectors within the ‘green’ economy creates a situation whereby training providers may be required to develop their training offer, ahead of the projected growth in demand.

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<sup>1</sup> A detailed study of the retrofit skills market has been conducted as part of phase 1 of this research project.

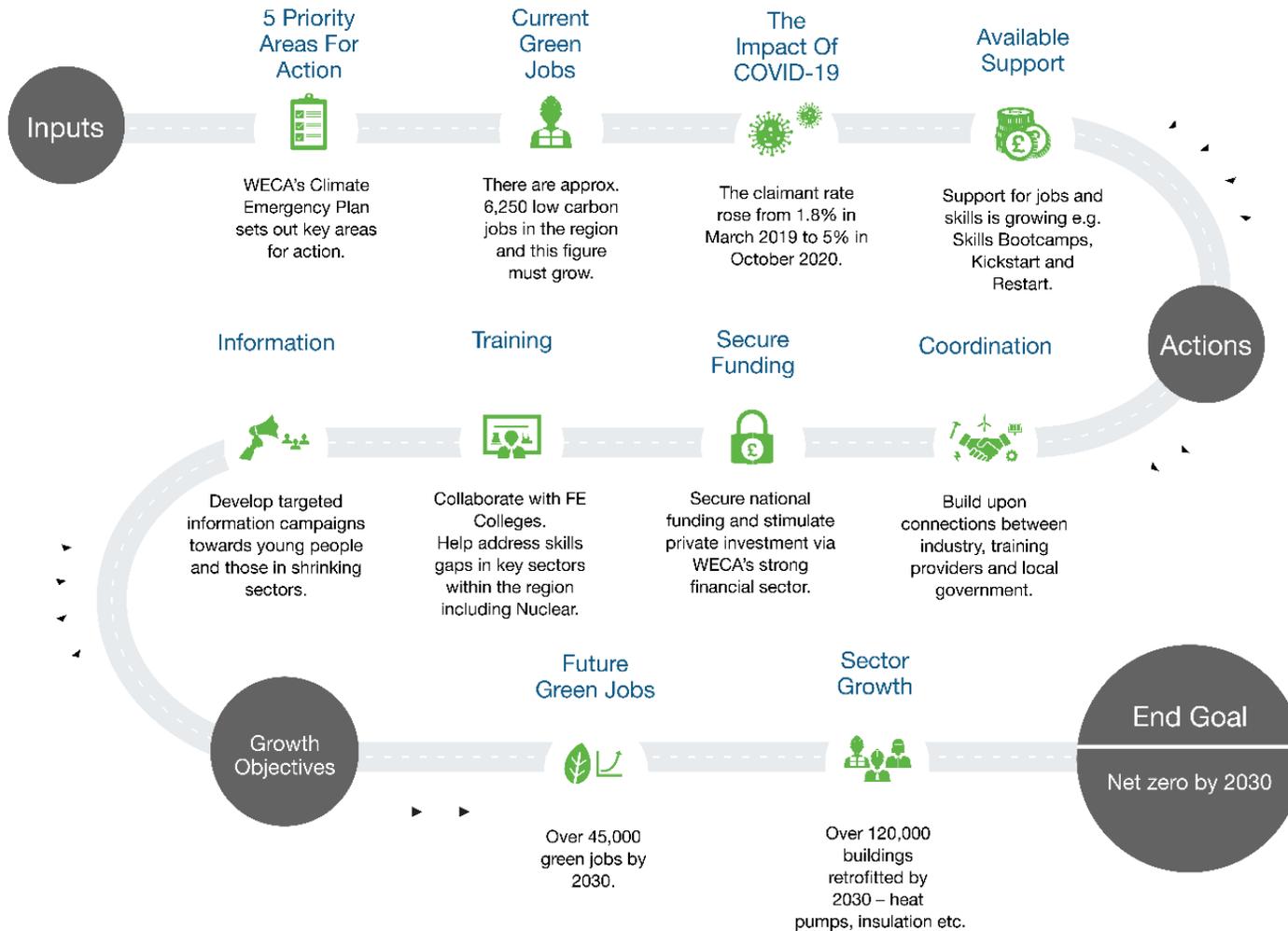
## The West of England Combined Authority has a chance to influence change and unlock opportunity in the region, through work with other local and national actors

With WECA's influence over adult education and skills support as well as a role in influencing policy and supporting local actors, the Combined Authority has the chance to play an important part in shaping and developing the skills base for the green economy and to seize the job growth opportunity presented. The recommendations for WECA are summarised in the below graphic. Each recommendation has been categorised based on the proposed implementation timescale. A short-term action should be considered within the next 12 months, a medium-term action refers to the next 1-3 years and the long-term actions could extend to 5 years. The longer-term actions tend to involve the development of policy at a national level or the evolution of skills training or courses. However, given the urgency of action to meet the region's net zero target, these actions should be considered as soon as possible. These recommendations have been shortened for the summary and further detail is presented in the 'Key Recommendations' section below.



# Pathway to Change

## WECA Green Skills Market



## The West of England Combined Authority

The West of England Combined Authority was formed in 2017 and consists of three local authorities in the region - Bath & North Somerset, Bristol, and South Gloucestershire. The devolution deal was first established to drive clean and inclusive economic growth within the region and address some of its key challenges, including housing, transport, skills and productivity. The combined authority continues to work closely with North Somerset Council and is the accountable body for the West of England Local Enterprise Partnership, with an aim to delivering economic growth for the region and addressing challenges such as productivity and skills, housing and transport.

Where we describe the 'WECA region' within this report, we refer to Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire.

## Policy Landscape and Context

The Paris Agreement is an international treaty on climate change that became legally binding in November 2016. The goal of the Paris Agreement is to limit global warming to below 2°C and ideally 1.5°C, relative to pre-industrial levels. The Paris Agreement was adopted by 196 Parties, including the UK, at COP21. As part of the Paris Agreement, countries submit Nationally Determined Contributions (NDCs), communicating the actions they will undertake in order to reduce their Greenhouse Gas Emissions<sup>2</sup>.

In June 2019, legislation was passed by Parliament which requires the Government to reduce the UK's net greenhouse gas emissions by 100%, compared to 1990 levels, hereinafter referred to as 'net zero' by 2050<sup>3</sup> which followed a recommendation from the Committee on Climate Change that a net zero target would enable the UK to deliver on its commitments to the Paris Agreement<sup>4</sup>. Following the UK's net zero commitment, in December 2020, the UK submitted its most recent NDC, announcing a target to reduce UK emissions by at least 68% by 2030<sup>5</sup>.

Prior to the introduction of the UK's net zero target, several Local Authorities (LAs) declared a climate emergency. Since this date, the majority of LAs have followed and as of October 2020, 74% of District, County, Unitary and Metropolitan Councils have declared a climate emergency as well as eight Combined Authorities/City Regions<sup>6</sup>.

The West of England Combined Authority (WECA) is made up of three of the councils in the region – Bath & North East Somerset, Bristol and South Gloucestershire. WECA also supports the Local Enterprise Partnership, which is business-led, and covers the four West

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<sup>2</sup> UNFCCC. (2016). [The Paris Agreement](#).

<sup>3</sup> Institute for Government. (2019). [UK Net Zero Target](#).

<sup>4</sup> Climate Change Committee. (2019). [Net Zero - The UK's Contribution to Stopping Global Warming](#).

<sup>5</sup> UK Government. (2020). [UK Sets Ambitious New Climate Target Ahead of UN Summit](#).

<sup>6</sup> Climate Emergency UK. (2020). [List of Councils Who Have Declared a Climate Emergency](#).

of England councils, including North Somerset Council<sup>7</sup>. WECA declared a climate emergency in 2019 and have also set an ambitious goal to achieve net zero emissions by 2030, two decades ahead of the national target<sup>8</sup> and in line with their partner Unitary Authorities. WECA's Climate Emergency Action Plan (CEAP) identified five grand challenge areas and subsequent actions to help reduce emissions and work towards carbon neutrality. Action has already been undertaken towards the respective net zero targets at the national level and within WECA, but further action is required.

## Progress Towards Net Zero

### National

Whilst the first and second carbon budgets were met and the UK is set to overachieve for the third carbon budget, which runs until 2022, the UK is not on track to meet either its fourth (2023 to 2027) or fifth (2028 to 2032) carbon budget<sup>9</sup>. According to the Green Alliance, a further £22.7 billion additional spending is required to address the climate emergency to the end of this parliament (2024). As part of the Net Zero Policy Tracker 2020 Round Up, the Green Alliance assessed progress towards decarbonisation, across several areas of the economy including Transport, Power and Industry and the Natural Environment. The Green Alliance Tracker also covers Buildings; detail on policies concerning the built environment has not been provided here, as a detailed policy round up is contained within the Phase 1 Report, which is focused on retrofit. Table 1 provides a brief summary of some of the key policy announcements within 2020 and Q1 of 2021 that concern these areas of the green economy.

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<sup>7</sup> WECA. [About Us](#).

<sup>8</sup> WECA. [Clean Growth](#).

<sup>9</sup> Climate Change Committee. [Advice on Reducing the UK's Emissions](#).

Table 1 - Progress and Policies Towards Decarbonisation in Transport, Power, Industry and the Natural Environment. Source: Green Alliance<sup>10</sup>, UK Government<sup>11; 12; 13;14; 15; 16;17;18; 19</sup>, HM Treasury<sup>20</sup> and CCC<sup>21</sup>

Sector	Progress Towards Decarbonisation	Policy and Funding Commitments Announced in 2020 and 2021 (Q1)
Transport	<p>Progress towards decarbonisation of the transport sector has been slow. Surface transport emissions account for 22% of UK Greenhouse Gas Emissions and between 2008 and 2018, emissions only fell by 3%.</p>	<p><b>Key Funding Announcements</b>            £12.1 Billion new spending on sustainable transport in 2020, committed over the next 5 years.</p> <ul style="list-style-type: none"> <li>• £2 Billion pledge for walking and cycling infrastructure.</li> <li>• £1.3 Billion to improve Electric Vehicle (EV) charging infrastructure.</li> <li>• Extension of plug-in vehicle grants.</li> </ul> <p>£500 million has also been committed towards the development and production of EV batteries.</p> <p><b>Key Policy Announcements</b></p> <ul style="list-style-type: none"> <li>• Phase out date for sales of new petrol and diesel cars and vans shifted from 2040 to 2030, with sales of certain hybrid cars and vans permitted until 2035.</li> <li>• The Transport Decarbonisation Plan was delayed and will be published in 2021. The Hydrogen Strategy is also expected.<sup>22</sup></li> <li>• Subject to business case, the Government will provide £4.8 million to enable the development of a Hydrogen Hub in Holyhead, Wales to trial hydrogen production.</li> </ul>

<sup>10</sup> Green Alliance. (2020). [Net Zero Policy Tracker: 2020 Round Up.](#)

<sup>11</sup> UK Government. (2020). [PM Outlines his Ten Point Plan for a Green Industrial Revolution for 250,000 Jobs.](#)

<sup>12</sup> UK Government. (2021). [Industrial Decarbonisation Strategy.](#)

<sup>13</sup> UK Government. (2021). [Build Back Better: Our Plan for Growth](#)

<sup>14</sup> UK Government. (2020). [Improving the Energy Performance of Privately Rented Homes.](#)

<sup>15</sup> UK Government. (2020). [Improving Home Energy Performance Through Lenders.](#)

<sup>16</sup> UK Government. (2021). [Government Boosts Energy Efficiency Spending to £1.3 Billion With Extra Funding for Green Homes.](#)

<sup>17</sup> MHCLG. (2021). [The Future Homes Standard](#)

<sup>18</sup> MHCLG. (2021). [The Future Buildings Standard.](#)

<sup>19</sup> UK Government. (2021). [Non - Domestic Private Rented Sector Minimum Energy Efficiency Standards: EPC B Implementation.](#)

<sup>20</sup> HM Treasury. (2021). [Budget 2021.](#)

<sup>21</sup> CCC. (2020). [The Sixth Carbon Budget: The UK's Path to Net Zero.](#)

<sup>22</sup> UK Government. (2020). [Creating the Transport Decarbonisation Plan.](#)

Buildings	<p>Buildings account for 18% of UK carbon emissions and progress to decarbonise the building stock has slowed in the last decade.</p>	<p><b>Key Funding Announcements</b></p> <ul style="list-style-type: none"> <li>• £50 million via the Social Housing Decarbonisation Fund (SHDF) which seeks to pilot innovative energy efficiency retrofit in social housing.</li> <li>• £500 million via the Local Authority Delivery (LAD) element of the Green Homes Grant, which supports households with an annual income of under £30,000 to retrofit their home.</li> <li>• The GHG Voucher Scheme (GHGVS), which provided vouchers to cover 2/3 of the cost of eligible energy efficiency improvements up to a value of £5,000, has closed leaving no scheme to drive uptake in the able to pay sector. The funding has been re-allocated to the council led scheme.</li> </ul> <p><b>Key Policy Announcements</b></p> <ul style="list-style-type: none"> <li>• The Prime Minister’s 10 Point Plan announced a target to deploy 600,000 heat pumps a year by 2028. The Clean Heat Grant is expected to replace the Renewable Heat Incentive. The Home Upgrade Grant will also be introduced to support low income households in off grid areas.</li> <li>• In 2020, the Government consulted on minimum energy performance standards for the Private Rental Sector (PRS).</li> <li>• In Q1 2021, the Government consulted on improving the energy performance of homes through mortgage lenders, to target the owner- occupied sector.</li> <li>• The Future Homes Standard will require new homes to be future proofed with low carbon heat and high levels of energy efficiency and will be introduced by 2025.</li> <li>• The Government also consulted on the Future Buildings Standard which looks at non-domestic buildings and opened a consultation on minimum energy efficiency standards in the non-domestic private rented sector.</li> <li>• The long- awaited Heat and Buildings Strategy is due for publication imminently.</li> </ul>
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Power	<p>Decarbonisation of the power sector has been strong, with emissions from the sector 62% below 1990 levels.</p> <p>However, it should be cautioned that one of the dominant drivers for emissions reductions was the switch from coal to gas in the so called “dash for gas”<sup>23</sup>.</p>	<p><b>Key Funding Announcements</b></p> <ul style="list-style-type: none"> <li>• £715 Million new spending on sustainable energy in 2020, committed over the next 5 years.</li> <li>• Key announcements in the Chancellor’s Budget included a £20 million programme to support floating offshore wind and a £68 million competition to support the development of energy storage prototypes.</li> <li>• £500 million new funding and support for nuclear power, with some focus on Small Modular Reactors and a further £100 million for nuclear fusion.</li> </ul> <p><b>Key Policy Announcements</b></p> <ul style="list-style-type: none"> <li>• Support for onshore wind and solar via the next Contract for Difference (CfD) auction in 2021.</li> <li>• Target to double the capacity of renewables in the next CfD auction.</li> <li>• Increase in offshore wind capacity target to 40 GW by 2030.</li> </ul>
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<sup>23</sup> Carbon Brief. (2019). [Analysis: Why the UK's CO2 Emissions Have Fallen 38% Since 1990.](#)

<p style="text-align: center;">Industry</p>	<p>Carbon emissions from industry have reduced by over 50% compared to 1990 levels.</p> <p>However, emissions from industry still account for greater than a fifth of UK emissions.</p>	<p><b>Key Funding Announcements</b></p> <ul style="list-style-type: none"> <li>• £2.6 Billion new spending on low carbon industry in 2020, committed over the next 5 years.</li> <li>• £315 million to improve the energy efficiency of industry via the Industrial Energy Transformation Fund (IETF).</li> <li>• £350 million package of support for decarbonising heavy industry, of which £139 million is designated towards CCS and Hydrogen.</li> <li>• A total of £1 billion has now been committed towards CCS.</li> <li>• £90 million funding from the Energy Innovation Fund towards the development of hydrogen, with a further £500 million pledged via the Ten Point Plan, £240 million of which is dedicated to Hydrogen production facilities.</li> </ul> <p><b>Key Policy Announcements</b></p> <ul style="list-style-type: none"> <li>• Target to remove 10 MT of CO<sub>2</sub> by 2030 through the development of two carbon capture sites by the mid-2020s and a further two by 2030.</li> <li>• Aim for a Hydrogen Neighbourhood in 2023, a Hydrogen Village in 2025 and a Hydrogen Town by the end of the decade.</li> <li>• The Industrial Decarbonisation Strategy is the first strategy published by a major economy which sets out how industries can decarbonise in line with net zero, whilst remaining competitive and ensuring emissions are not simply exported.</li> </ul>
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<p style="text-align: center;">Natural Environment</p>	<p>The land use and forestry sector in the UK removes approximately 15 MTCO<sub>2</sub>e per annum.</p> <p>There have been key policy announcements surrounding job creation in the natural environment.</p> <p>However, commitments towards wider Nature Based Solutions (NBS) have been limited, with no significant funding or announcements towards the Peat Strategy, for example.</p>	<p><b>Key Funding Announcements</b></p> <ul style="list-style-type: none"> <li>• The Green Jobs Challenge Fund was announced in 2020. The fund of £80 million will be used to support conservation organisations, as well as suppliers, in the creation of up to 3000 jobs and the safeguarding of 2000 jobs in areas including nature-based solutions. According to research by Friends of the Earth, land restoration, reforestation and agricultural improvements could create 81,000 jobs for young people, nationally<sup>24</sup>.</li> <li>• A £4 million competition will form the first phase of a Biomass Feedstocks programme which will enable the rural economy to improve green energy crop production and the production of forestry products.</li> </ul> <p><b>Key Policy Announcements</b></p> <ul style="list-style-type: none"> <li>• In July, the UK Government made a commitment to plant 75,000 acres of trees every year by 2025.</li> <li>• The Agriculture Bill sets out a strategy for the way in which farmers and land managers in England will be funded public money to improve ‘public goods’, including air, water and soil.</li> </ul>
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<sup>24</sup> Friends of the Earth. (2021). [An Emergency Plan on Green Jobs for Young People.](#)

## Local

Within the WECA region, carbon emissions have reduced by a total of 35% since 2005<sup>25</sup> and CO<sub>2</sub> emissions per capita are lower in the West of England (4.5 tonnes CO<sub>2</sub>/person) compared to the UK as a whole (5.2 tonnes CO<sub>2</sub>/person). Crucially, this reduction in emissions has occurred whilst the region's economy has grown, indicating that economic growth can be achieved alongside carbon reduction<sup>26</sup>.

In fact, the West of England Local Industrial Strategy highlights clean growth as one of the regions priorities<sup>27</sup>. This is supported through a number of schemes to help the region decarbonise, including community owned renewables, innovation funding and trials, and strategic plans covering key issues such as transport and spatial planning.

WECA's [Climate Emergency Action Plan](#) is part of a set of plans for the region, that stem from the West of England Local Industrial Strategy. WECA's CEAP sets out five key areas for action (See Figure 1), with progress is already underway across these areas<sup>28</sup>.

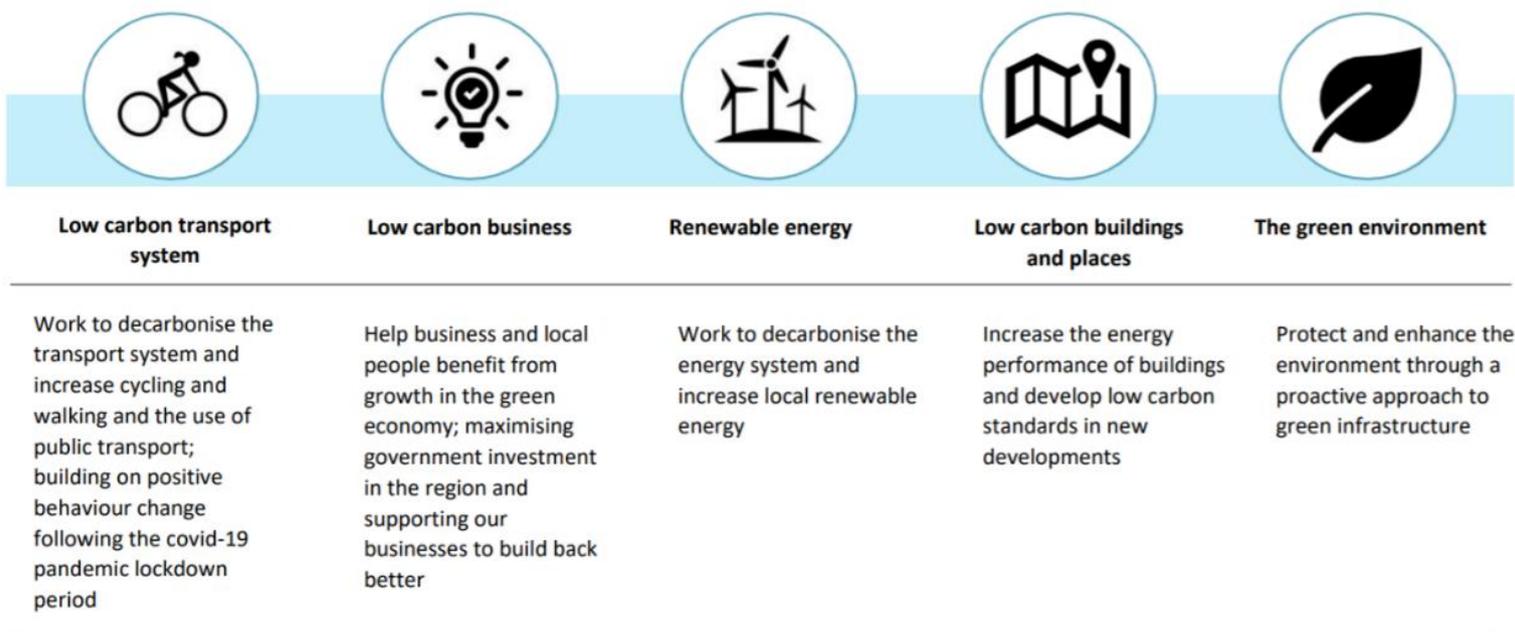


Figure 1 - Five Priority Areas for Action in the WECA Region. Source: [WECA](#)

1. **Low Carbon Transport:** The transport sector is notoriously difficult to decarbonise; a total of 44% of the regions emissions are from transport and emissions have only reduced by 5% since 2005. However, beyond the schemes cited above, significant funding has been committed to the decarbonisation of the transport system.

<sup>25</sup> WECA. [Clean Growth](#).

<sup>26</sup> WECA. [West of England Climate Emergency Action Plan](#).

<sup>27</sup> WECA. (2019). [West of England Local Industrial Strategy](#)

<sup>28</sup> WECA. [West of England Climate Emergency Action Plan](#).

- a. £123 million of £133 million of the transport budget allocated to WECA has been used to support sustainable modes of transport.
- b. £28 million has been committed to Future Mobility Zone proposals.
- c. In August 2020, WECA launched the 'joy of the journey campaign' to encourage local residents to walk or cycle instead of using a car for short journeys. WECA has agreed to allocate £10 million towards walking and cycling measures and £3 million to cover the cost of short-term measures such as widening pathways and introducing temporary cycle lanes<sup>29</sup>.
- d. The Joint Local Transport Plan 4 aims to reduce car journeys, whilst the Bus Strategy aims to double the number of bus journeys by 2036.

Ambitious plans to improve the region's transport system are currently under discussion, with the development of a mass transit network across four key routes being considered: Bristol to Airport, Bristol to North Fringe, Bristol to East Fringe and Mass Transit Bristol to Bath. A range of technologies are being explored including buses as well as overground and/or underground rails<sup>30</sup>.

2. **Low Carbon Business:** Beyond the initiatives highlighted above, funding has been committed to enable businesses and local people to thrive within the green economy.
  - a. £5 million has been invested in the Digital Engineering Technology and Innovation (DETI) project to enable the tools required to accelerate low carbon products to be identified and developed.
  - b. £10 million has been invested in The Institute for Advanced Automotive Propulsion Systems (IAPPS), which is a centre of excellence for the development of zero (and ultra-low) emission vehicles.
3. **Renewable Energy:** Initiatives such as the South West Energy Hub and Low Carbon Challenge fund (see below) are important in supporting the growth of renewable energy within the region.
4. **Low Carbon Buildings and Places:** Beyond the initiatives highlighted below, WECA has worked on developing an evidence base for the Spatial Development Strategy to support the delivery of new homes that are carbon neutral. Further information about building decarbonisation is contained within the Phase 1 Report.
5. **The Green Environment:** [The West of England Joint Green Infrastructure Strategy 2020-2030](#) is an important part of WECA's action towards the development of green infrastructure. In addition to this, £300,000 has been allocated to developing Green Infrastructure Projects.

In summary, WECA has committed investment across the green economy in areas including innovation, public transport and renewable energy generation and the region has a range of initiatives currently in place to support emissions reductions, as well as increase the share of renewable energy. As highlighted above, initiatives such as the Low Carbon Challenge Fund and South West Energy Hub are important in supporting the growth in renewable

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<sup>29</sup> WECA. [West of England Mayor Launches New Cycling and Walking Campaign.](#)

<sup>30</sup> WECA. [WECA Unveils Ambitious Transport Plans.](#)

energy across the region. However, these programmes also benefit other areas of the economy and as such, detail about these initiatives has been provided below.

The [Low Carbon Challenge Fund](#)<sup>31</sup> supports the shift to a low carbon economy and a green recovery from Covid-19. It has a £3.2m grant available for the region, funded from the European Regional Development Fund (ERDF) and WECA's Recovery Fund. Further detail on the individual grant streams has been set out below.

1. [Green Business Grants](#): This is a £1.7m pot, with £200k already allocated. The grant of up to £15k supports small & medium sized enterprises (SMEs) to improve the energy efficiency of their buildings and business operations. Within the first allocation round, the measures installed included lighting, heating, insulation and efficiency equipment for manufacturing. A new application window is now open until 25 June 2021<sup>32</sup>.
2. [Local Energy Scheme](#): This £1.3m scheme supports small scale, renewable energy projects such as Ambition Community Energy's wind turbine to be based in Avonmouth. This innovative renewable onshore wind project will also support delivery of the Lawrence Weston Community Plan, including an Energy Learning Zone at the site. A further Local Energy Scheme grant round will be open later in 2021<sup>33</sup>.

The [South West Energy Hub](#) is led by WECA and supports organisations across seven Local Enterprise Partnership (LEP) areas in identifying, developing and implementing energy projects that improve the way in which energy is used, supplied and/or distributed. The Hub helps get public sector and not-for-profit low carbon energy projects up and running through Local Capacity Support, the Rural Community Energy Fund (RCEF) and Low Carbon Retrofit. As part of this, the South West Energy Hub has been tasked by BEIS to deliver the Green Homes Grant Local Authority Delivery Phase 2 and is also working on the social housing technical pilot. A range of energy projects are eligible for support including low carbon electricity and heat generation, energy supply for low carbon vehicles, home energy retrofit and strategic energy investment development<sup>34</sup>. The Hub may also support revenue investment that offers a new service to consumers where it is innovative, has potential for wider adoption and contributes to transformation of the energy market<sup>35</sup>.

## Skills Investment

Investment in skills is a government priority. Last year, the Government made several commitments towards Education and Skills Development. The March 2020 budget allocated £3 billion towards a National Skills Fund and in October, the Government confirmed integration of the National Retraining Scheme into the National Skills Fund. As part of the Spending Review, the Chancellor announced that £375 million from the National Skills Fund would be invested in 2021/22 towards a range of programmes including adult technical courses, traineeships, sector-based work academy placements and the National Careers Service.<sup>36</sup>

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<sup>31</sup> WECA. [Low Carbon Challenge Fund](#).

<sup>32</sup> WECA. [Green Business Grants](#).

<sup>33</sup> WECA. [West of England Local Energy Scheme](#).

<sup>34</sup> SWEH. [What We Do](#)

<sup>35</sup> WECA. [South West Energy Hub](#).

<sup>36</sup> Institute for Government. (2021). [Policy Tracker](#).

As part of the Lifetime Skills Guarantee, any adult aged 24 or over who wishes to attain their first full Level 3 Qualification will be able to access approximately [400 fully funded courses](#) across areas including engineering, construction and environmental conservation. A total of £95 million is being made available through the National Skills Fund, which will be directed towards enabling adults to gain qualifications as well as supporting training providers in scaling up their training provision<sup>37</sup>.

The Skills Bootcamp Programme will complement this offer and provide adults with free, flexible courses of between 12-16 weeks in length. Skills Bootcamps are available to enable individuals to develop digital and technical skills<sup>38</sup>.

**1. Digital Skills:**

- a. Software Development
- b. Digital Marketing
- c. Data Analytics

**2. Technical Skills:**

- a. Welding
- b. Engineering
- c. Construction

Although there isn't currently a Skills Bootcamp in the West of England Local Enterprise Partnership (LEP), Skills Bootcamps will be expanded into other areas in 2021. Expansion will be supported by investment of £43 million from the National Skills Fund which will support both greater variety and availability of courses.

The Government's [Plan for Jobs](#) was published in July 2020 and aims to protect, support and create jobs across the UK. When the Chancellor announced the Plan for Jobs in 2020, there was indication that overall, the Plan would be worth up to £30 billion. Further detail surrounding some of the key commitments has been provided below.

1. **Kickstart Scheme:** The [Kickstart Scheme](#) provides funding for the creation of new job placements for individuals aged between 16-24 who are on Universal Credit and are at risk of unemployment. Under the scheme, funding is available for employers which covers 100% of the National Minimum Wage or National Living Wage for a total of 6 months at a rate of 25 hours per week, alongside National Insurance contributions and automatic enrolment contributions.
2. **Restart Scheme:** The Government's £2.9 billion Restart Scheme will provide additional support to individuals on Universal Credit who have been out of work for at least 12 months.
3. **Apprenticeships and Traineeships:** The Government's Plan for Jobs committed an additional £111 million for the development of traineeships in England. It is thought that the funding will be sufficient to triple participation in trainees. The Government will provide £1000 of funding per trainee, funding employers who provide trainees with work experience. As part of the Plan for Jobs, the Government also introduced a payment for apprenticeships which ran from August 2020 to January 2021.

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<sup>37</sup> UK Government. (2020). [Adults to Gain New Skills on 400 Free Courses.](#)

<sup>38</sup> UK Government. (2020). [National Skills Fund.](#)

- 4. National Careers Advice:** In the Plan for Jobs, the Government committed £32 million funding for the next 2 years for the [National Careers Service](#) to provide an additional 269,000 more people in England with a personalised advice service for training and work.

WECA also run a range of skills programmes to drive action at the local level, some of which have been outlined below:

- 1. Workforce for the Future:** [Workforce for the Future](#) is a skills analysis and development programme for SMEs. The £8 million programme is co-funded by WECA and the European Social Fund (ESF).
- 2. Future Bright:** [Future Bright](#) offers free career coaching, training and support to provide individuals with the skills and confidence to progress along their chosen career path.
- 3. Adult Education Budget:** funding £14.7million of adult education to help adults over the age of 19 to develop skills and qualifications needed for life, work, apprenticeships and further learning.
- 4. Digital Skills Investment Programme:** a new £2million pound recovery programme supporting growth in the digital sector to drive recovery and growth. This 18-month fund will support 1) basic digital skills to build capacity; and 2) medium to high level digital skills to build on skills interventions and assets to deliver short, innovative, bespoke training to address specific digital skills gaps across a range of sectors and job functions/roles.
- 5. The Careers Hub:** [WECA's Careers Hub](#) works with 95 schools across the region to support young people in making informed decisions about their careers, through creating opportunities for them to connect with future employers, seek careers advice and gain meaningful work experience.
- 6. The Employability and Skills Portal:** The [Employability and Skills Portal](#) lists support services and training available in the West of England, providing a central hub which brings together the local, regional and national skills training and employment services available to residents and businesses in the West of England.

## Low Carbon Economic Activity in the WECA Region

### Measuring Activity

Each year the Office for National Statistics (ONS) produces estimates on the size of the low-carbon and renewable energy economy (LCREE). The LCREE survey is the primary source of official information on low-carbon activity in the UK. This survey captures a range of data such as employment, number of businesses and gross value-added (GVA).

The LCREE monitors 17 sectors ranging from offshore wind, insulation, to energy storage. These 17 sectors can be placed into six high-level groups.

*Table 2 – Definition of LCREE as defined by the Office for National Statistics. Source: [ONS](#)*

Group	Sectors
Low-carbon electricity	Offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, nuclear, carbon capture & storage
Low-carbon heat	Renewable heat, renewable CHP
Energy from waste and biomass	Bioenergy and alternative fuels
Energy efficient products	Energy-efficient products, energy-efficiency lighting, energy monitoring, saving or control systems
Low-carbon services	Low-carbon financial and advisory services
Low-emission vehicles and infrastructure	Low-emission vehicles and infrastructure, fuel cells and energy storage systems

While this ONS definition is a good starting point, it is not a comprehensive assessment of the low-carbon economy. Firstly, the LCREE survey only collects data on direct low-carbon activity and not indirect activity (that is, the additional activity generated in the economy due to wider supply chain effects). Secondly, and more importantly for WECA, the definition excludes important sectors such as Green Finance, Digital Skills, Environmental Services, Afforestation and Aerospace.

On the first point, the prevailing solution has been to use Type 1 multipliers to calculate the indirect low-carbon activity. The sum of the direct and indirect low-carbon activity provides total activity (i.e. jobs and GVA). The second issue has been addressed by supplementing the current LCREE definition with information and data on other key sectors (see above) that are important to the West of England. We believe this is a good way to bridge the gap between the macroeconomic figures and local sector strengths in the West of England (please see the appendix for a detailed methodology on how the data was estimated).

### Initial Conclusions

It is estimated that within the WECA region, there are currently around 6,250 low carbon jobs, the estimated sector breakdown is shown below on Figure 2. Few prior studies exist to verify our calculations; however, a 2013 study of the UK's low-carbon sector found there to be around 28,600 low-carbon jobs in the wider South West of England. The WECA region currently accounts for around 24% of all employment in the South West of England. Ecuity's

estimate of 6,250 jobs in WECA as a share of overall low-carbon jobs in the South West (28,600) is around 22% demonstrating that low carbon employment is broadly in line with the overall employment share for the south west of England.

Estimated Low Carbon Jobs in 2020 by Sector

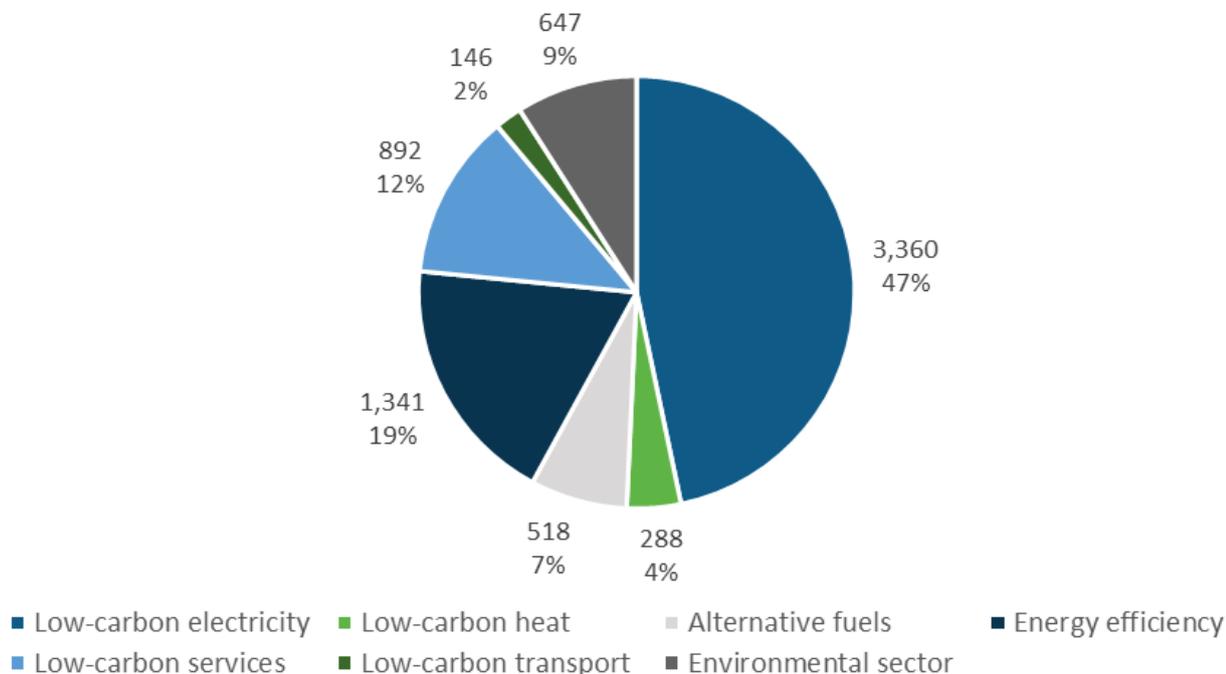


Figure 2 - Estimated Low Carbon Jobs in 2020 by Sector

Gross Value Added (GVA) of the low-carbon sector in the WECA region is estimated at £760m in 2020. This implies that GVA per low-carbon employee is around £120,000, around 2.5 times more than the average GVA per full time employee (£47,278<sup>39</sup>) in WECA. Indeed, government spending on renewable energy and energy efficiency has been shown to create more jobs (~2.8x more) than spending on fossil fuels<sup>40</sup>.

<sup>39</sup> Assumes a GVA of £33bn and a workforce of 698,000 – [Business Plan 2020-21](#)

<sup>40</sup> McKinsey & Co (2020) [How a post-pandemic stimulus can create jobs and help the climate](#)

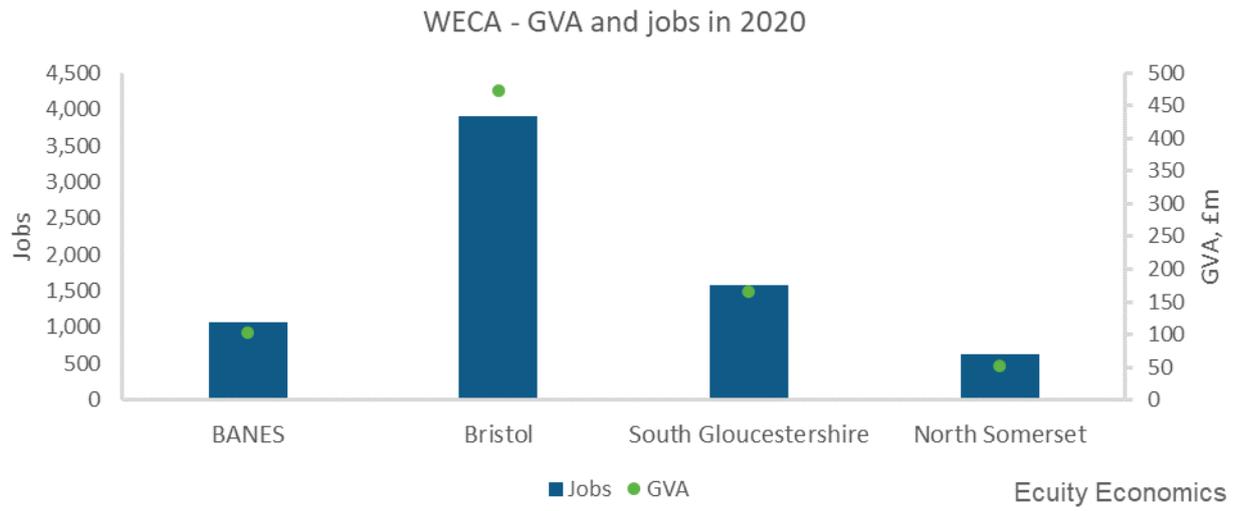


Figure 3 – Direct and indirect GVA and jobs in 2020 across the West of England regions.

## Economic Outlook for the Region

Historically, WECA has performed favourably compared to the national average on several economic indicators. The region had the 11th highest GVA per head of any LEP in the UK in 2018. At £34.50 per hour, this was marginally lower than the UK average of £35.00, although this figure is skewed by the high GVA per hour rates in London and the South East, and the West of England LEP performs very well when compared to other regions outside of the London/ South East area.

High productivity is partly due to the high skill level of workers in WECA. In 2019, 45% of the working age population in WECA had NVQ level 4 or above, significantly higher than England at 40%. This skills metric sees WECA ranked 6th out of 38 LEPs.

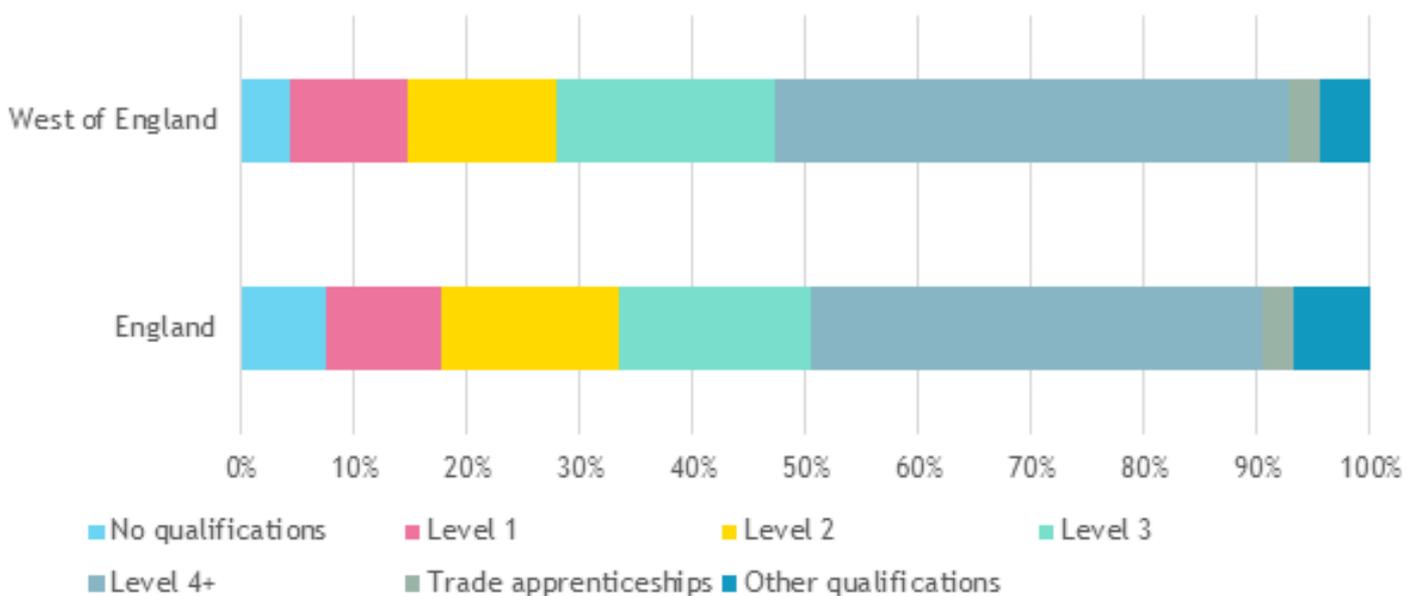


Figure 4 - Qualification Levels in the West of England Relative to England as a Whole.  
Source: [West of England Employment & Skills Plan](#)

In 2019, WECA had a working age population (16-64) of 743,705. This is roughly 64% of all individuals in the region, lower than the UK at 67%. The working age population is projected to increase by 7% by 2030, or roughly an additional 53,000 individuals of working age. The projected population growth of those aged over 65 is greater at 24%, although in pure terms, this results in similar growth (48,000) over the same period<sup>41</sup>.

<sup>41</sup> WECA (2019) [West of England Employment and Skills Plan](#) (Updated with more up to date ONS data)

Employment in WECA by Sector in 2019

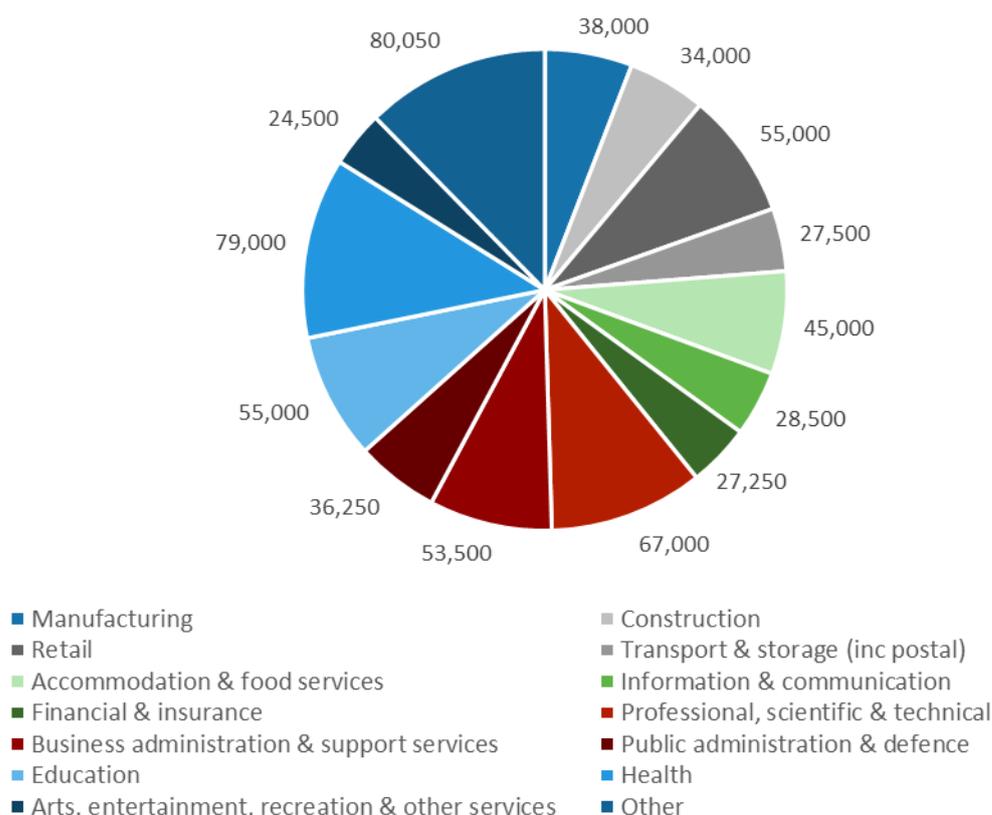


Figure 5 - Employment in WECA by Sector (2019). Source: ONS [BRES](#)

As can be seen in Figure 5, key sectors within WECA, making up over 40% of total employment, include Professional, scientific and technical; Retail; Education; and Health.

The Covid-19 pandemic has had a significant impact on WECA in terms of employment. The claimant rate rose from 1.8% in March 2019, to 2.1% in March 2020 and then again to 5.0% in October 2020. The pre-Covid-19 levels of unemployment were lower in WECA than England, which recorded claimant rates of 2.6% in March 2019, 3.0% in March 2020 and 6.3% in October 2020. Not only did WECA have a lower claimant rate in March 2019, but the change from March 2019 to October 2020 was also lower at 3.2% for WECA and 3.7% for England<sup>42</sup>. It is difficult to predict with any level of certainty how these claimant rates will evolve in the near future. The easing of restrictions may result in a bounce back in employment as hospitality and other sectors recover. Conversely, the removal of government support such as the furlough scheme could amplify job losses.

There is potential for a green recovery from the current recession caused by the Covid-19 pandemic. This will require collaboration between central government, businesses, education and local government. Whilst WECA has a role to play in local action, particularly in stimulating economic growth, supporting business and skills growth, central government investment and policy will be necessary to stimulate a green recovery. Central government have higher budgets and greater powers (e.g. taxation) than local government, which will be vital to accelerate emissions reductions.

<sup>42</sup> WECA (2021) [Labour Market Intelligence Pack](#)

Provided there is sufficient support from government, households, training providers and businesses, there is significant employment potential in the retrofit market, installing insulation and low carbon heat in all buildings in WECA by 2030. Retrofit could support over 23,000 jobs in WECA by 2030 through both direct and indirect employment. Low carbon services has also been identified as a key sector for a green recovery in WECA. This sector includes low carbon advisory, green finance, environmental consulting and digital low carbon jobs. There could be over 9,500 jobs in WECA within the low carbon services sector in 2030<sup>43</sup>.

## Demand for Low Carbon Jobs and Skills

### Job Opportunities

#### Region

Analysis by Ecuity found that in order for the WECA region to meet net zero by 2030, a further 50,383 total net jobs would be required. This would consist of 29,669 direct jobs and a further 20,715 indirect jobs as the wider supply chain would mobilise to support the increased demand for low-carbon technologies and infrastructure.

Almost half of the total jobs needed (48%) would be created in Bristol, given its economic size compared to other regions in WECA. Just over one-fifth of jobs (23%) would be created in South Gloucestershire, followed by demand for jobs in Bath & North East Somerset (BANES) and demand for jobs in North Somerset (13% of total additional jobs). The benefits of the job creation will be felt by WECA as a whole and not the individual local authorities. The small geographic size of the combined authority means that an individual from any of the four regions can commute to any other area within WECA.

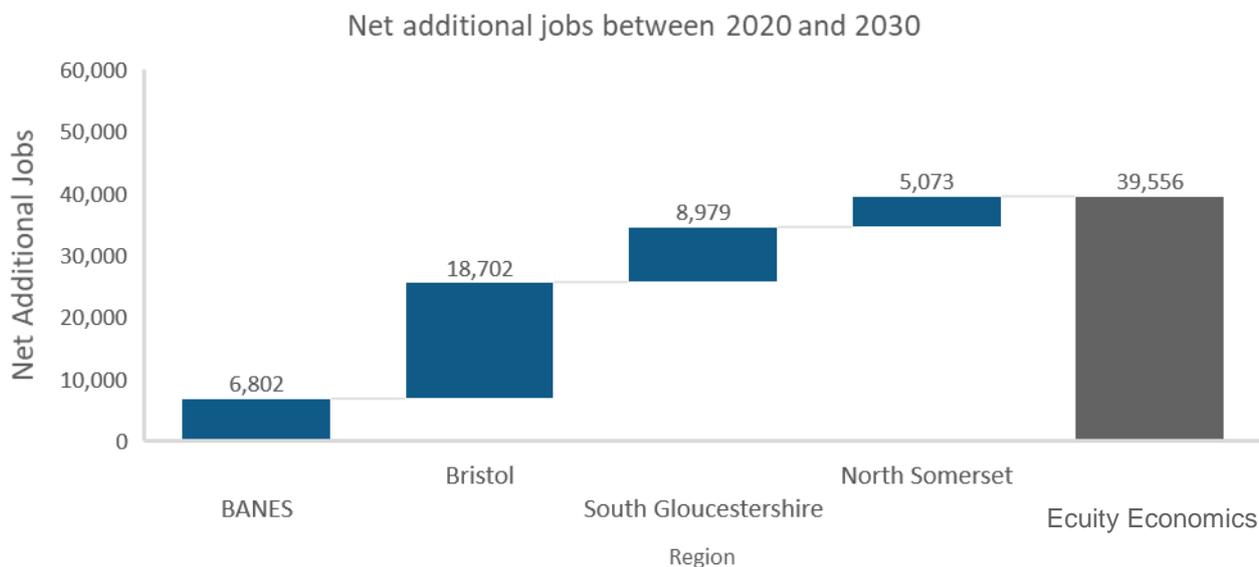


Figure 6 – Additional Jobs Required Between 2020 and 2030 by Region.

<sup>43</sup> This is in line with an Atkins study which estimates an increase in employment in the professional services sector of over 22,000 by 2040

## Sector

Jobs are projected to be created across a range of low-carbon sectors to enable WECA to meet net zero by 2030. Most jobs will be created in the low carbon heat sector (33%), particularly heat pump installers. Heat pumps are widely seen as a key enabler to decarbonise heat in domestic and non-domestic buildings and as a result demand for heat pump installers will increase across WECA.

Demand for jobs in energy efficiency will rise sharply to account for 17% of total additional low carbon jobs needed by 2030. These jobs will be required to ensure homes across WECA can reduce their energy consumption and emissions. The West of England has existing strengths in financial, business, and legal services. As organisations transition to become net-zero compliant, demand for low-carbon specialist advisers will increase. In addition, demand for digital skills engaged in low-carbon activity will also increase. Overall, around one-quarter of jobs needed by 2030 will be engaged in low-carbon services such as green finance, digital and advisory services (legal and technological).

Decarbonising energy will be vital to enable WECA to become net-zero compliant by 2030. As a result, demand for jobs in the low-carbon electricity sector will increase to facilitate. Around 15% of jobs will be required to decarbonise electricity namely in sub-sectors such as nuclear, solar PV and onshore wind. Design and planning engineers will be required to install modular nuclear reactors and plants. In the solar sector, jobs could be created to enhance the installer base to deliver grid-connected solar for utility and decentralised generation.

Decarbonising emissions from road transport will be necessary to meet net zero. As drivers replace their petrol and diesel cars with alternatives such as electric vehicles, a robust network of electric charge points will be required to ensure driver concerns such as range anxiety are alleviated. In addition, the WECA region has an existing sector strength in aerospace engineering. Demand for jobs will increase to help manufacture and assemble low-carbon and alternative-fuelled propulsion engines and systems.

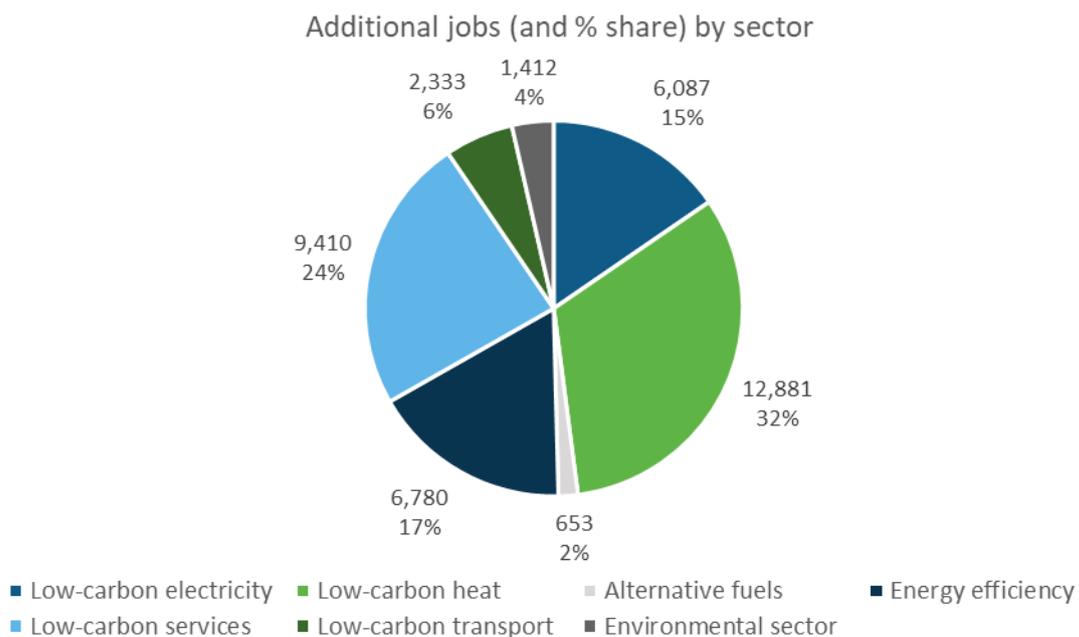


Figure 7 – Jobs Opportunity by Sector in 2030. Source: Ecuity Economics

## Reskilling Opportunities

While the majority of low carbon jobs will require training, there are lots of traditional roles which have transferable skills that can be applied in the low carbon sector. Switching to low carbon jobs for these roles will likely require a lower level of training due to some of the skills already in place. For example, individuals from a sales background can join the sales team of companies selling low carbon technology with some training to understand the product. Similarly, roles in customer service have transferable skills across sectors. Some low carbon roles require more specific training and experience. In this instance, only certain traditional roles will reduce the training requirement when moving into the low carbon sector. Some of these roles are shown in Figure 8.

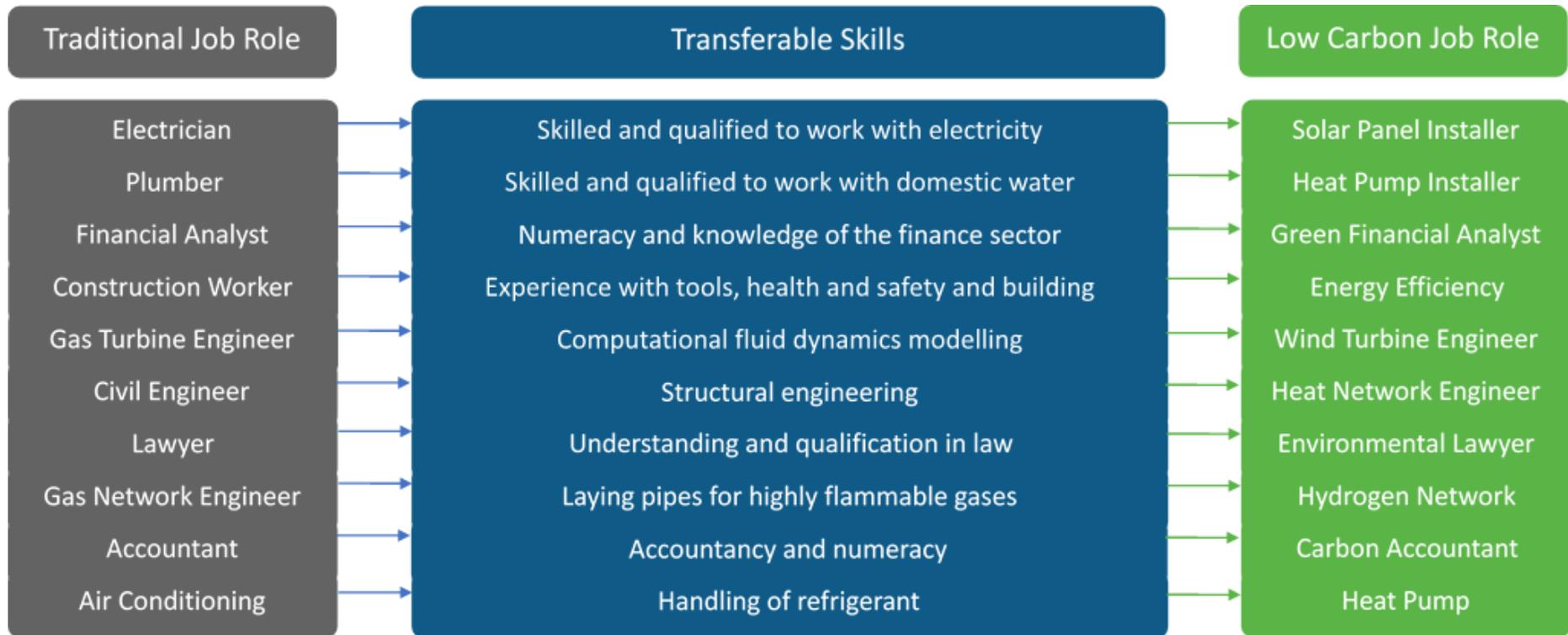


Figure 8 - Mapping Traditional to Low Carbon Job Roles

## GVA Growth

### Region

An additional £2.9 billion in GVA could be unlocked for the WECA region as it transitions to become net zero by 2030. By 2030, Bristol is predicted to account for around half (49%) of the GVA growth across WECA. South Gloucestershire is expected to account for a little under one-quarter (23%) of low-carbon GVA and BANES and North Somerset are expected to account for 17% and 11% of WECA GVA, respectively.

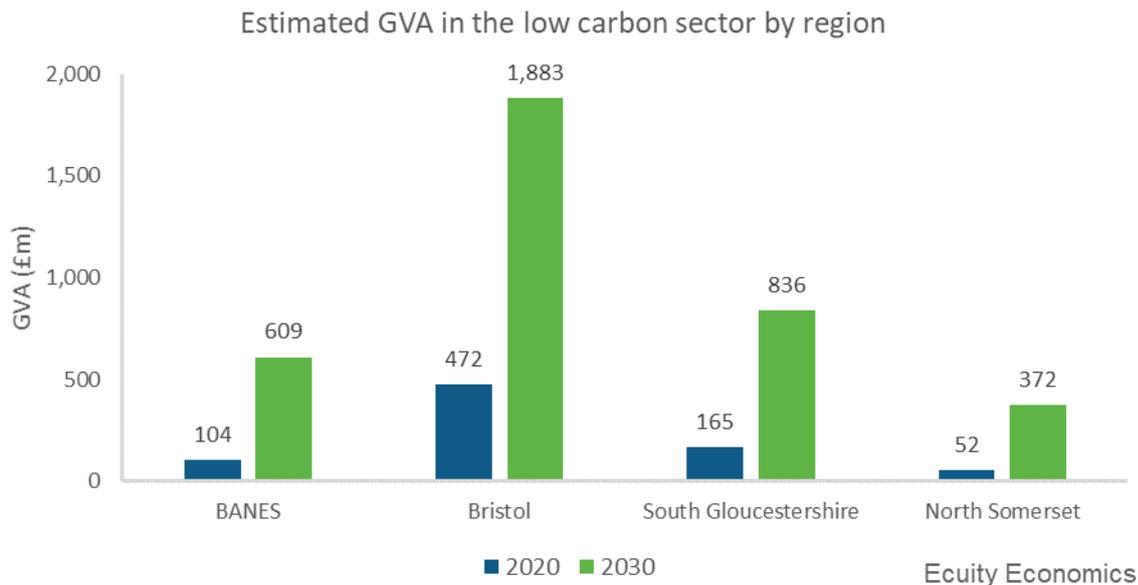


Figure 9 – GVA of the Low-Carbon Sector Across WECA in 2020 and 2030.

### Sector

The low-carbon services sector is anticipated to account for around one-third (33%) of GVA across WECA. Significant value-added is predicted for low-carbon digital services followed by advisory services and green finance.

Around 22% of GVA growth is predicted to come from low-carbon electricity driven by high-value added sectors such as nuclear and solar PV. The low-carbon heat and energy efficiency sectors are predicted to account for 19% and 18% of GVA growth by 2030. This will largely come from installers of heat pumps and insulation materials.

The low-carbon transport is expected to account for 8% of GVA growth by 2030. This will mainly be driven by the value-added provided by high-skilled aerospace engineers and systems analysts. The wide-spread installation of electric vehicle charge points will also support GVA growth.

## Growth Scenarios

To understand the impact that economic and social factors could have on the low carbon economy in WECA, various growth scenarios have been developed. In particular, the impact Covid-19 is likely to have on the WECA labour market will be of paramount importance. Growth forecasts can provide invaluable intelligence and help WECA understand which sectors and regions may require additional support to meet net zero.

### *i. Baseline*

*This is a pre-Covid and business as usual scenario utilising established data and projections from BEIS scaled down to West of England level.*

### *ii. Net Zero 2030*

*This scenario assumes that Covid has little impact on the low carbon sector and the Net Zero 2030 target is reached.*

### *iii. Covid – Baseline*

*This is a Covid scenario which forecasts the impact on the low-carbon sector in WECA. Under this scenario, WECA's ambition of meeting net zero by 2030 is not satisfied.*

### *iv. Covid – Net Zero 2030*

*This is another Covid scenario which forecasts the impact on the low-carbon sector in WECA. Under this scenario, WECA's ambition of meeting net zero by 2030 is satisfied.*

These Scenarios will require a large shift in the workforce and collaboration between government, businesses and training providers to ensure the correct economic conditions and skills to make the low carbon recovery a reality.

The total number of modelled green jobs under each scenario is shown on Figure 10.

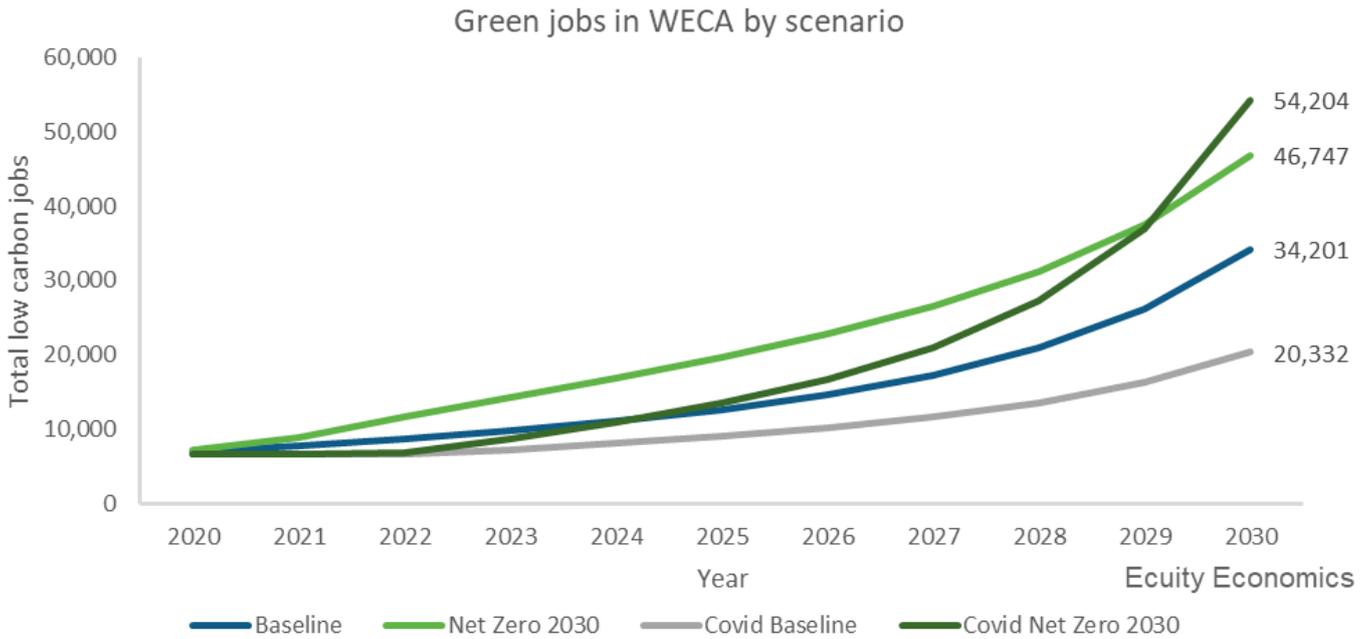


Figure 10 - Green Jobs in WECA by Scenario

## Jobs Opportunity by Type

### Manufacturing

A range of different jobs will be required to enable WECA to become net-zero compliant by 2030. We estimate that around 10% of additional low carbon jobs will be manufacturing-based. This builds on WECA’s strong capabilities in aerospace and advanced manufacturing sectors and being home to one of the largest clusters of composite materials researchers and engineers in the world. It is estimated that approximately 800 additional low carbon aerospace manufacturing jobs would need to be created for WECA to reach net zero. These jobs would take the form of efficiency improvement design, development of sustainable aviation fuels and the manufacturing of components that reduce aerospace emissions.

Approximately 12% of the manufacturing jobs would need to be in nuclear energy, estimated at 500 additional jobs. These will be necessary to scale up the nuclear energy capabilities of the region which is already a hub for this low carbon energy source. It is recognised that nuclear manufacturing will also come from other regions. However, there are already companies based in WECA manufacturing components for nuclear sites such as Balfour Beatty which manufactures concrete for Hinkley Point C.

Roughly 39% of projected manufacturing jobs are in the production of energy efficiency measures. These include efficient lighting, insulation and controls and monitoring with the majority of jobs in the manufacture of insulation and controls, estimated at roughly 800 and 560 respectively. These jobs will result from a retrofit program that sees the building stock in WECA brought up to low consumption standards by 2030. Other sectors have a growth

in low carbon manufacturing jobs, albeit to a lesser extent than the key manufacturing sectors shown above.

## **Construction and Installation**

The majority of projected low carbon additional jobs will be in the construction and installation job type, estimated at 52%. This is primarily driven by retrofitting the majority of existing buildings with energy efficiency measures and low carbon heat as well as construction and installation of low carbon electricity generation.

Due to the need for low carbon heat to be in place in all buildings by 2030 and the lack of viable options in this time frame, we estimate that over 11,000 additional jobs will need to be created in the installation of heat pumps. Creating both the supply of installers and demand for heat pumps will be a key challenge for WECA in reaching net zero by 2030.

Almost 4,000 additional jobs will need to be created in installation of energy efficiency measures, with roughly 2,500 of these installing insulation. These job estimates are lower than for heat pumps due to the assumed earlier ramp up of insulation installers as shown in the phase one report. This earlier ramp up results in fewer jobs in 2030 but a higher number of installers in the early 2020s. An earlier ramp up of insulation installers allows for a fabric first approach to decarbonising heating which is the most efficient approach for the majority of properties.

Low carbon electricity generation is estimated to create 3,500 additional jobs in 2030 with the majority of these in solar and nuclear, building on WECA's strengths in these sectors.

## **Operations and Maintenance**

This job type includes traditional operations and maintenance of low carbon technology as well as the operations of low carbon and environmental services. A little under two-fifths (38%) of low carbon jobs are projected to be in operations and maintenance to support the transition to net zero and ensure infrastructure is functioning correctly.

Of the 38% of additional low carbon jobs which are in operations and maintenance, 63% are in the low carbon services sector, making up almost 9,500 additional jobs. Most of this job growth is projected to be in low carbon advisory and digital jobs at roughly 4,000 and 4,600 respectively. The remaining 900 additional jobs are in the green finance sector.

Due to the nature of environmental consulting, all jobs fall in this job type as there is no manufacture or construction. These are estimated at roughly 1,200 additional jobs.

Insulation requires little maintenance so in this case operations and maintenance jobs capture all the supporting roles in the insulation sector including sales, marketing and management. We estimate roughly 800 jobs will be created in these roles to support the delivery of large scale retrofit by 2030.

Solar PV will require more jobs in monitoring and maintenance, estimated at roughly 750. Although levels of maintenance are low, monitoring is important to ensure commercial solar farms are operating effectively. More general operational roles such as sales exist for solar as well as jobs with more specific roles to solar energy such as site finding, feasibility studies, arranging grid connections and negotiating with landowners. Nuclear operations and

maintenance jobs are estimated to reach almost 900 additional jobs in 2030, including roles such as nuclear operator, engineers and those involved in decommissioning.

## Emerging Skills Gaps

### Overview of Research

There is great potential for job creation within the green economy in the WECA region. However, as highlighted by Aldersgate Group, urgent action is required in order to address the skills deficit that, at present, “undermines the growth of low carbon supply chains across the UK economy.”<sup>44</sup>

Understanding the existing and emerging skills gaps across the green economy will be vital in ensuring a just transition<sup>45</sup>. To assess the emerging skills gaps within the low carbon economy, a combination of desk-based research and market research was employed. As part of the market research conducted, key stakeholders across the low carbon economy in sectors including renewable power generation, low carbon transport, green finance and environmental law were invited to take part in semi-structured interviews as well as surveys. Further information about the market research conducted is contained within the Appendix.

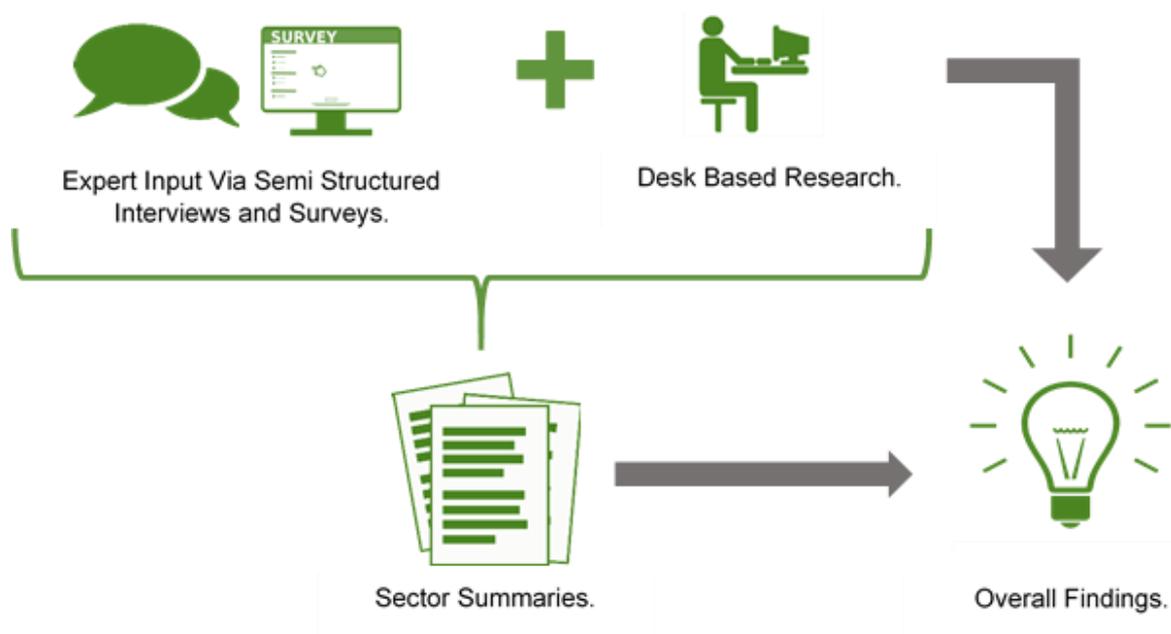


Figure 11 - A Summary of the Research Methods Employed to Assess the Emerging Skills Gaps

### General Skills for the Green Economy

Our research highlighted that skills shortages do not necessarily exist across all areas of the green economy. Some of the respondents interviewed from sectors such as environmental law and green finance held a positive view that recruitment was not a significant challenge and that there were limited skills shortages within their sector. Whilst there were projections that skills shortages may emerge in the future as demand grows, increased interest in the green agenda was noted as an important driver for new entrants to the sector. Research indicates that there is much to be positive about in this regard; a survey conducted by

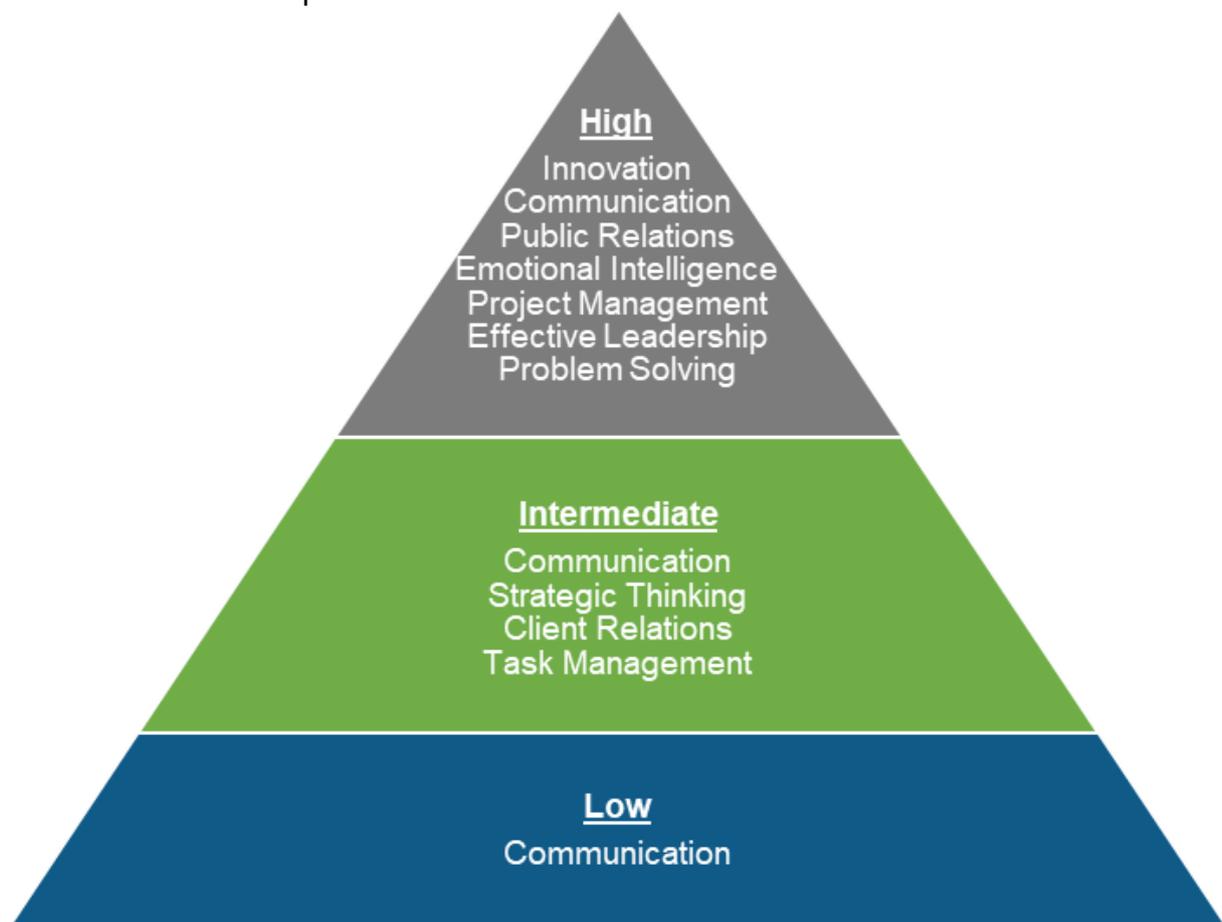
<sup>44</sup> Aldersgate Group. (2020). [Upskilling the UK Workforce for the 21st Century](#).

<sup>45</sup> House of Commons. (2021). [Environmental Audit Committee – Oral Evidence: Green Jobs and the Just Transition](#).

Aldersgate Group found that 78% of adults want to play their part in reaching the UK's net zero goal and 57% want to work for an organisation that helps us get there<sup>46</sup>.

Whilst some sector representatives did not indicate that they faced significant skill gaps, others held the view that there were skills shortages and challenges associated with recruitment, resulting from an absence of available skills. Some of the existing and emerging skills gaps highlighted as part of the market research conducted are likely to be applicable across the low carbon economy, whilst others are highly specific to individual sectors. For sectors deemed to be of particular importance to the WECA region, further information surrounding some of the discrete challenges facing these sectors has been provided in the relevant sections below.

From a high-level perspective, it is interesting to look at soft skills that are perceived to be particularly important for the low carbon economy (see Figure 12). These skills will need to be nurtured and developed.



*Figure 12 - Soft Skills Market Research Respondents Perceived to be Particularly Important for the Low Carbon Economy*

Beyond the soft skills identified in Figure 12 above, it is interesting to consider the role of digital skills. Digital skills are becoming increasingly important and are intrinsic to the green economy.

<sup>46</sup> Aldersgate Group. (2020). [Upskilling the UK Workforce for the 21st Century](#).

Digital skills and coding will play a key role in the development of technologies to enable the energy transition as well as industrial decarbonisation more widely. Some examples of areas of the green economy where digital skills may be particularly valuable have been outlined below.

1. Retrofitting Homes
  - a. Building Information Modelling (BIM)
  - b. 3D printing to address the performance gap.
  - c. Coding to develop applications/software to connect the smart home.
2. Decarbonising the Grid
  - a. Digitalised platforms to enable decentralised energy trading and demand side response.
  - b. Further development and operation of digital substations to manage network constraints and higher penetration of renewables in real time.
  - c. Cyber security across the energy system as it digitalises.
  - d. Advanced weather monitoring to better predict generation of renewable energy assets.
  - e. GIS software and skills for evaluating site feasibility for renewable energy assets.
3. Decarbonising Industry
  - a. IoT, Industry 4.0, Machine Learning and AI to drive efficiencies
4. Decarbonising Transport
  - a. Smart chargers for electric vehicles to reduce carbon intensity of electricity used.

There is clearly a digital skills gap within the UK; a survey conducted in 2018 found that 21% of people in the UK lack the full basic digital skills<sup>47</sup> and in 2018 only 12% of executives believed that graduates possessed sufficient digital skills<sup>48</sup>. Some of the key findings from the literature were echoed within the market research conducted.

Our respondent was the Managing Director of a full fibre Internet Service Provider and Distributor, delivering gigabit connectivity to businesses across the UK. The company works in partnership with network operators, IT providers and developers, as well as other key stakeholders and has around 100 staff. The permanent core business team is highly qualified and based in close proximity to the WECA region; this team forms approximately 25% of the workforce. The company also has a large operational communications team, at a low qualification level, who form approximately 75% of the workforce and are based nationwide. Focused on the business team, the respondent noted a lack of confidence in digital skills amongst the workforce, including in areas such as managing and utilising online portals and platforms. There was a call for ongoing, practical training to enable these skills to be developed across the workforce as opposed to specific qualifications. Whilst addressing digital exclusion and enabling people to develop these baseline skills is fundamental, there are also specific digital skill requirements across the board. Specific digital skills are required in 28% of low-skill jobs, 56% of middle skill jobs and 68% of high skill jobs. The digital skills requirements vary with geographical location. In engineering centres such as Bristol, engineering and advanced manufacturing digital skills are perceived to be particularly important. In the South West region as a whole, baseline digital skills are

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<sup>47</sup> UK Government. (2019). [Essential Digital Skills Framework](#).

<sup>48</sup> Ignite Digital. (2018). [We're Facing a Huge UK Digital Skills Gap - Infographic](#).

required within 75% of job adverts, with specific digital skills required within 55% of job adverts. Digital skills demand is higher than the UK average in the Computer & Networking and Machinery & Manufacturing Technology Sectors<sup>49</sup>.

The digital skills shortage has financial implications, particularly at the higher level. A study conducted by the Learning and Work Institute found that less than half of UK employers believed new entrants to the workforce were equipped with the necessary advanced digital skillset and 76% of businesses believed a lack of digital skills would hit their profitability<sup>50</sup>. This was echoed within our market research; one respondent active in the digital economy noted that the shortage of individuals with high level digital knowledge means that those with the appropriate skills are able to command a competitive salary. There was also an indication from the market research conducted that digital skills including 3D, VR and AR will be incredibly important to major manufacturers and contractors going forward.

As highlighted previously, one area which demonstrates the intrinsic nature of high-level digital skills in the energy transition is in decarbonising the grid. Representatives from the electricity and smart energy management sub-sectors stated that there was a clear call for digital skills, as well as electrical engineering skills within the space. As we move to an increasingly electrified energy grid; the ability to control and balance electricity flows will become increasingly important, with a need to grow and develop local energy trading markets, which will require energy providers to become more agile and develop their skills base. As one respondent highlighted, “[we will need to observe] engineers and electricians becoming the IT specialists, software managers and system integrators of the future.” Whilst sector specific, high level technical skills could be developed in house, there was an indication that digital and baseline electrical skills could be developed as part of a sector driven initiative, along with other soft skills, in order to raise standards across the board.

It is important to consider that digitalisation has other skills implications across a range of sectors. As one respondent highlighted, we are moving to a place where knowledge is increasingly available at the point of use. To this end, there is perhaps less of a need to develop knowledge and more of a need for people to come to industry with the behaviors and work readiness required to enable continued adaptability.

Work is underway within the region to develop the digital skills base both at the baseline levels and in the higher levels through a range of initiatives, many of which have been supported by WECA which will be valuable in enabling the region to further develop. Some of the initiatives noted as part of the market research conducted have been highlighted below.

### The West of England Institute of Technology (WEIoT)

In April 2019, the Government announced that a total of 12 Institutes of Technology (IoTs) would be set up. One of the successful applications was led by Weston College, to create a

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<sup>49</sup> Department for Digital, Culture, Media and Sport. [No Longer Optional: Employer Demand for Digital Skills](#).

<sup>50</sup> The Guardian. (2021). [UK Digital Skills Shortage Risks Covid Recovery as Young People Shun IT Courses](#)

West of England Institute of Technology (WEIoT). The WEIoT has been developed to “equip people with the skills to fully participate in, and contribute to, economic growth driven by digital innovation and emerging technologies.”<sup>51</sup> By 2024, the centre aims to deliver Science, Technology, Engineering and Maths (STEM) Led Education and Training to over 2000 individuals, with learners studying at least a Level 4 Qualification and over 96% of learners focused on technical disciplines, across a range of sectors, one of which is Digital and High Technology. A range of colleges within the region are collaborating in the Digital and High Technology Space (See Figure 13).

## Digital and High Technology

Digital skills are highly valued; and will be vital in the future. The digital age is expanding into all areas of our lives, and it is not just those who work in IT that will be leading this change. We offer support in the Higher Technical Qualifications in Digital skills and High Tech sector.

	Bath College	Yeovil College	UWE Bristol	Weston College	Glos College
Level 4	✓	✓		✓	✓
Level 5	✓	✓		✓	✓
Level 6		✓	✓	✓	✓

Figure 13 - Digital and High Technology as Part of the West of England Institute of Technology. Adapted From: [WEIoT](#)

### I-START

The I-START project is a collaboration between the University of Bath, Bath Spa University, Bath and North East Somerset Council and WECA. Subject to funding, I-START will be situated within Bath and will help local people to gain skills within the digital sector. Co-location of the learning space with start-up businesses and SMEs (through the SETsquared Bath Innovation Centre) will help to foster partnerships between students and businesses. The facility will also provide space for the Institute of Coding to deliver courses<sup>52</sup>.

In addition to initiatives such as the WEIoT and I-START, WECA is supporting the growth of the digital skills sector within the region. As part of WECA’s Recovery Plan, a total of £2 million has been allocated to a [Digital Skills Investment Programme](#) (DSIP). The full programme will seek to target both basic digital skills and access as well as medium to high level digital skills., The first call for applications was focused on enhanced digital skills, with up to £1 million available. In addition, WECA is currently supporting lower and entry level digital skills via its Adult Education Budget and further low to medium calls will go out to fill

<sup>51</sup> West of England Institute of Technology. (2021). [WEIoT](#)

<sup>52</sup> University of Bath. [Proposal for City Centre Innovation Centre gets £300 k Boost.](#)

any gaps as needed shortly. Consortia of employers, training providers, colleges and other representative groups were provided with the opportunity to apply for between £50,000 to £250,000 to develop creative approaches to developing 'in demand' digital skills within the region. The focus of the first call was on "intensive responsive solutions" to enable job vacancies to be filled and ultimately for career progression to be enabled. The call closed on 1<sup>st</sup> March 2021 and delivery will be between April 2021-March 2022<sup>53</sup> As noted above, further calls to build the pathway from lower to specialist skills will be made shortly.

It is also worth noting that WECA recently published a [Digital Skills Pack](#). The purpose of this document is to:

1. Provide Labour Market Intelligence highlighting skills demanded within the digital sector and other industries with a large digital component, and analyse the skills demanded within different digital career 'pathways' within these sectors.
2. Contribute evidence to the ongoing process of identifying where gaps in skills provision exist (currently being undertaken as a separate exercise) that, if filled, could see significant benefits for the region<sup>54</sup>.

In summary, our research looking at the green economy as a whole found that there are a range of common skills that may be important in the transition. Core soft skills identified include communication, innovation, leadership and project management. In addition to these core soft skills, digital skills more widely will be incredibly valuable in the transition. In fact, digital skills are intrinsic to the green economy and will be key across a range of areas including the retrofit of homes, the decarbonisation of the grid and the shift to low carbon transport and industry. There are already a range of initiatives to support digital skills development in place including initiatives funded by WECA and delivered by a range of partners as well as national provision. These initiatives will be valuable in helping to ensure that the current and future workforce are equipped with the digital skills required. Looking forward, key actors such as training providers should look at how digital skills may be integrated into core programmes and green courses. In an increasingly digitalised world, every sector will be competing for individuals with digital skills and it is important that those working within the green economy have the skills required to successfully contribute.

In addition to the general skills that will be valuable to the green economy, our conversations with key stakeholders looked at the discrete opportunities and challenges associated within key sub-sectors of the green economy. The next section provides a more detailed insight into sectors of particular importance for WECA.

## Sector Specific Overview

The low carbon energy and environmental sector encompasses a wide range of industries and sub-sectors. This section of the report focuses on the following sub-sectors which we have highlighted as being particularly important for WECA, as a result of an existing comparative advantage in the region (e.g. aerospace, nuclear and low carbon services services), and a significant net-zero need (e.g. solar PV and EV charge point installation).

The sub-sectors covered in this section in detail include:

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<sup>53</sup> WECA. [Digital Skills Investment Programme Appendix A – Specification and Guidance](#).

<sup>54</sup> WECA. (2021). [Digital Skills Pack](#).

- Low Carbon Services
  - Green Finance – page 29
  - Environmental Law – page 32
- Environmental Consulting – page 34
- Engineering
  - Nuclear – page 36
  - Aerospace – page 43
- Construction – page 45
- EV Charging Points – page 51
- Solar PV – page 55

## Sector 1: Low Carbon Services

### *Green Finance*

The finance sector in WECA had an employment of approximately 10,000 in 2019 using the ONS definition of financial service activities. However, there are also individuals employed in supporting roles which are not included in this definition. Including those involved in fund management and activities auxiliary to financial services increases this employment estimate for WECA to approximately 17,500 in 2019. These estimates do not include employment in pensions or insurance<sup>55</sup>.

The United Nations Environment Programme (UNEP) defines Green Finance as a mechanism to “increase level of financial flows (from banking, micro-credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities.”

The green agenda is perceived to be gaining momentum within financial institutions as a result of a range of drivers including the Government’s ‘Green Recovery’ agenda, COP26 which will be hosted in Glasgow on 1-12 November 2021<sup>56</sup> and the 2021 Biennial Exploratory Scenario (BES) exercise which will assess the resilience of major banking and insurance firms surrounding the risks associated with a range of climate scenarios<sup>57</sup>.

Globally, green lending has grown significantly since 2012 (See Figure 14). Whilst London has ranked as the world’s top financial sector for the quality of its green finance offering, it has not performed as well in terms of the depth of the market and did not feature within the top 15 countries in 2015 for green bond issuance which, according to the Confederation of British Industry, is commonly used as a guide for assessing green finance market progression<sup>58</sup>.

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<sup>55</sup> ONS. (2021). [Business Register and Employment Survey](#)

<sup>56</sup> UN Climate Change Conference UK 2021. (2021). [UK COP 26](#)

<sup>57</sup> Bank of England. (2019). [Bank of England Consults on its Proposals for Stress Testing the Financial Stability Implications of Climate Change.](#)

<sup>58</sup> CBI. (2019). [Green Finance Position Paper.](#)

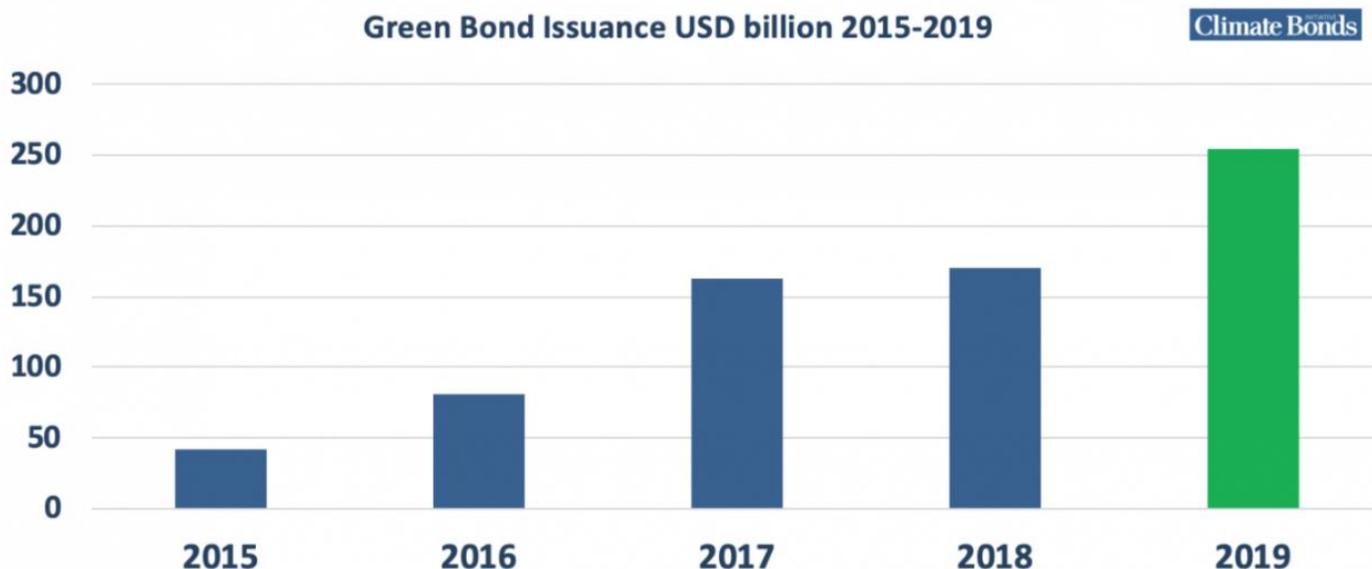


Figure 14 - Green Bond Market Summary. Source: [Record 2019 Green Bond Issuance](#).

However, there is a view that the green finance market is set to grow within the UK as a result of green initiatives and regulatory support<sup>59</sup>. On 2 July 2019, the UK launched the [Green Finance Strategy](#) which sets out the UK Government’s proposals for placing Green Finance at the centre of the UK’s Clean Growth Strategy, 25 Year Environment Plan and Industrial Strategy.

### Box 1: Green Bonds

The UK Government recently announced plans for one of [Europe’s largest green bond issuance programmes](#); the agency responsible for the issuance of UK sovereign debt indicated that it would sell at least £15 billion green bonds in FY 2021/22 alone. Further details of the green bond (or gilt) will be published in 2021, including the types of expenditure that will be financed. The social benefits such as job creation and levelling up will be reported on.

In Summer 2021, a Green Retail Savings product will be introduced in the summer of 2021. This product will be linked to the green gilt framework and will enable savers to take part in the collective effort to tackle climate change.

At the local level, West Berkshire Council recently launched the UK’s first [Community Municipal Investment \(CMI\)](#) which provides West Berkshire residents and community groups with an opportunity to invest in green projects and activities to support the region in attaining its net zero target.

<sup>59</sup> UK Government. (2020). [Green Bonds and a Look to the Future](#).

The perception that the green finance market is set to grow in the UK was validated by our interview with a representative from a leading organisation in the Green Finance Sector who indicated that above 100% growth would be required within their organisation, resulting from the increasing expertise required across the public and private sectors, with growth across the wider green finance sector also anticipated. The interviewee went on to indicate that their organisation was growing at present and expanding into various areas within the green economy, through a transport coalition as well as a nature coalition.

There is perhaps some uncertainty surrounding where growth of the sector will occur in terms of qualification levels. The 2017 Graduates in the Labour Market statistical release indicated that 'Banking and Finance' currently employ a greater proportion of graduates than non- graduates, with 15% of non-graduates employed in Banking and Finance and 21% of graduates<sup>60</sup>. Our conversations with a leading organisation within the sector, which both convenes and leads sectoral coalitions, indicated that whilst within their organisation and the green finance sector as a whole, there are currently a large proportion of individuals within the within the high qualification level (Level 5 and above). Over the next decade, the sector will become more systemic in indicating that Financial Officers across the UK will have to develop an understanding of Green Finance.

The potential for job creation within the WECA region specifically is perhaps less certain. The geographical dispersion of jobs within financial services across the UK is dependent upon the definition employed. According to the ONS definition, the majority of jobs within the financial service sector are based in London (Figure 15).



Figure 15 – Jobs in Financial Services. Adapted From: [House of Commons Research Briefing](#)

<sup>60</sup> ONS. (2017). [Graduates in the UK Labor Market: 2017](#).

However, the transition to remote working, resulting from the Covid-19 pandemic and the launch of the Government's National Infrastructure Bank in the North of England, as part of the Government's 'Levelling Up Agenda,'<sup>61</sup> may lead to a greater geographical dispersion of job opportunities within the sector.

An industry expert within the Green Finance sector, consulted as part of the market research, indicated that most of the workforce are sufficiently skilled but there is a need to recruit and upskill a larger workforce. They also indicated that although those currently within the sector are passionate about net zero ambitions, the key to systemic growth of green finance within financial services will be ensuring that the next generation of financiers understand the environmental impact of investment decisions.

A recent Sustainable Finance Skill Net Survey<sup>62</sup>, which looked at finance skills and talent requirements within Ireland. A total of 67% of respondents indicated that there is "current demand for sustainable finance skills and talent within their organisation but supply is inadequate, and upskilling is required." It seems clear that at least some level of upskilling is required, and this may come from upskilling the existing workforce and encouraging new entrants to the sector. According to the Skills Net Survey, 87% of respondents expected existing employees to be upskilled in sustainable finance within their organisations, whilst 60% indicated that their organisations require new hires to have third level qualifications with sustainable finance and ESG considerations embedded.

Action is underway to develop qualifications for individuals keen to engage in the sector. The Green Finance Education Charter was launched in July 2019 as part of the UK's [Green Finance Strategy](#). The Charter is a commitment from both Chartered and Professional bodies within the UK and overseas to integrate sustainability and green finance into core curriculums, as well as new qualifications and wider professional development activities. As part of the charter, signatories are asked to commit to a range of activities, including those listed below<sup>63</sup>:

1. Collaborate with other signatories and relevant stakeholders to promote the integration of green and sustainable finance into both academic and professional training programmes.
2. Work with GFI to increase the take up of green and sustainable finance programmes.

The [Green and Sustainable Finance Certificate](#) is awarded by the Chartered Banker and Distributed by the Chartered Institute for Securities & Investment, both signatories of the Charter. It is a Level 4 Certificate targeted towards a range of individuals within the sector. A total of 130 hours of study is required for the Level 4 examination and the syllabus covers a range of areas including climate related financial risks, key sustainable finance principles

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<sup>61</sup> Financial Times. (2020). [Sunak Set to Launch UK Infrastructure Bank to Fund Capital Projects](#).

<sup>62</sup> Deloitte. (2019). [Deep Sector Analysis of Future Sustainable Finance Skills and Talent Requirements in Ireland](#).

<sup>63</sup> Green Finance Institute. (2020). [Financing the Green Recovery with Launch of the World's First Green Finance Education Charter](#).

and the role of the financial system in addressing climate change<sup>64</sup>. Delivery of the learning materials and examination is online.

### *Environmental Law*

Environmental Law covers a range of areas including environmental pollution and renewable energy generation<sup>65</sup>. As part of the market research conducted, a partner from a law firm active in the low carbon and sustainability sector was invited to take part in an interview. As with the green finance sector, the respondent indicated that the majority of the existing workforce sit in the high qualification level (approximately 75%, with 15% at the intermediate level and 10% at the low level). This finding was anticipated; looking at the legal sector as a whole, university degrees remain the primary route of entry into the Legal Profession within England and Wales<sup>66</sup>. However, it is important to highlight that there are other routes into the legal sector, some of which have been highlighted below.

In terms of sector growth, the respondent interviewed anticipated that there would be between 0-50% growth within the sector over the next five years, indicating that recruitment efforts within their firm were already underway. Looking at the legal sector as a whole between 2017-2018, the revenue generated by legal activities increased by 6% in the UK, with the revenue of the UK's largest 100 law firms growing by 9% amongst the UK's largest 100 law firms. Certain areas of the UK have already experienced a growth in Environmental Law<sup>67</sup>.

There was a view that jobs may be created local to the region, particularly given the role of the South West in driving the low carbon economy. Looking at the legal sector more widely, Bristol, alongside a few other selected cities in the UK, is renowned for both its legal services expertise and its contribution to the UK's legal training and education sector<sup>68</sup>.

A study by Clayton Legal, a specialist recruiter, which looked at the law sector as a whole in 2018, found that 67% of law firms in the UK felt that skills access to talent could impact future growth<sup>69</sup>. This may be due in part to the 2008 recession, which led to major law firms cutting their client intakes, resulting in a shortage of trainees with greater than 5 years' experience across areas such as banking corporate and property law<sup>70</sup>.

It is clear that there is at least some degree of skills shortage across the legal sector as a whole. Our respondent, a partner at a law firm active in the low carbon and sustainability sector with presence in the WECA region, expressed relatively positive views about the state of the sector. They noted that their firm was not facing significant skills shortages, with the majority of the workforce sufficiently skilled and reasonable levels of engagement in terms of new entrants observed to date. However, this view was cautioned with the fact that skills shortages could arise with sector growth in the future, which aligns with the indication within the Clayton Legal study that access to talent could impact future growth.

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<sup>64</sup> CISI. (2020). [Green and Sustainable Finance Certificate](#).

<sup>65</sup> The University of Law. [Legal Practice Areas: Environmental Law](#).

<sup>66</sup> QLTS. (2018). [How to Become a Lawyer in the UK](#).

<sup>67</sup> The City UK. (2019). [Legal Excellence, Internationally Renowned](#).

<sup>68</sup> The City UK. (2019). [Legal Excellence, Internationally Renowned](#).

<sup>69</sup> Clayton Legal. [The Challenges and Opportunities Facing Law Firms in 2018](#).

<sup>70</sup> Idex. [The Skills Shortage: The Challenge of Attracting Legal Candidates](#).

One specific challenge noted in the market research conducted was that certain areas of the legal sector are particularly complex and that this resulted in certain specialisms, such as Power Offtake Agreements within Energy Law, being sustained only by the largest law firms. There was a call for government support to grow certain areas of the market and enable economies of scale to be unlocked. Although the availability of Professional Training Courses within the sector is currently good, there is potential for government backed training in these more complex areas to ensure the provision of a sufficiently skilled workforce. This would help to drive market growth and ultimately drive down costs, opening the market up to a wider range of firms.

In terms of new entrants to the sector, there are two key degree level educational pathways to becoming a lawyer in the UK. The first is to read a full law degree (LLB) and the second is to study an undergraduate degree within a different discipline and to then undertake a Graduate Diploma in Law (GDL) or a Common Professional Examination (CPE)<sup>71</sup>. Graduates of these courses are then required to undertake professional education. Broadly speaking, the legal profession in England and Wales is divided into two: Solicitors and Barristers and the professional education requirements differ between the two routes.

Whilst skills inflows and outflows are likely to occur, with individuals local to the region relocating for study and individuals coming to the region to study, a list of some of the providers of the above courses have been displayed in Table 3, for reference.

*Table 3 – A Non-Exhaustive List of LLB, GDL and CPE Providers in the WECA Region.  
Sources: [What Uni](#) and [Bar Standards Board](#)*

LLB	GDL or CPE
<a href="#">The University of Bristol Law School</a>	<a href="#">BPP (Bristol Campus)</a> (GDL)
<a href="#">Bath Spa University</a>	<a href="#">Bristol Law School (University of the West of England)</a> (GDL)
<a href="#">Bristol Law School (University of the West of England)</a>	<a href="#">The University of Law (Bristol Campus)</a> (GDL)
<a href="#">The University of Law (Bristol Campus)</a>	

Upon completion of their studies, an individual can begin training. According to the respondent surveyed in the sector as part of the market research conducted, individuals are increasingly entering the Environmental Law sector directly. Historically, a key route into Environmental Law has been to work for a private firm on a range of legal topics, including Environmental Law, before moving exclusively into the field. However, increasingly, there are other routes available, such as pursuing further studies or training programmes<sup>72</sup>. The respondent interviewed indicated that there already exists a range of professional training courses, provided by private sector training courses that individuals can attend to learn about new and evolving mechanisms.

There are also legal apprenticeships within the UK, which range from Level 2 to Level 7 (See Table 4). A list of these apprenticeships and associated training providers either within

<sup>71</sup> ClientEarth. [How to Become an Environmental Lawyer in the UK.](#)

<sup>72</sup> ClientEarth. [How to Become an Environmental Lawyer in the UK.](#)

or in close proximity to the WECA region have been provided in Table 4. It is important to highlight that this list is not exhaustive.

Table 4 - Legal and Law Apprenticeships. Source: [Rate my Apprenticeship](#).

Qualification Level	Legal Apprenticeship	Training Provider
Low	<a href="#">C&amp;G Level 2 Diploma in Legal Administration (5528 - 12)</a>	This Level 2 course is offered by Pitman Training in <a href="#">Bristol and Taunton</a> as well as other locations in the UK.
Intermediate	<a href="#">C&amp;G Level 3 Diploma in Legal Administration (5528-13)</a>	A Law Firm based across the UK, including in Bristol and Taunton take on individuals wishing to undertake the <a href="#">Legal Administrator Level 3 Apprenticeship</a> .
	<a href="#">NALP Level 3 Paralegal Qualification</a>	A Law Firm based across the UK, including in Bristol and Taunton take on individuals wishing to undertake the <a href="#">Paralegal Level 3 Apprenticeship</a> .
	<a href="#">Level 4 Probate Technician</a>	According to GOV.UK, there are currently <a href="#">no training providers</a> of this course.
High	<a href="#">Chartered Legal Executive Level 6 Diploma in Law and Practice</a>	This course is offered at <a href="#">Weston College</a> as well as other locations in the UK.
	<a href="#">Level 6 Diploma in Conveyancing Law and Practice</a>	According to SQA, the closest location offering this course is <a href="#">Newport</a> , with other providers across the UK.
	<a href="#">Level 7 Solicitor</a>	According to GOV.UK, there are providers of this course within <a href="#">Bristol</a> , with other providers across the UK.

## Sector 2: Environmental Consulting

The ONS define this sector as consulting activities for environmental projects. This is a broad definition and could be interpreted in a number of ways. Typical specialisms for environmental consultants include air, land and water contamination; environmental impact assessment and flood risk; and waste management and recycling as well as other areas<sup>73</sup>. The ONS SIC codes do not capture the ecological sector. There are no SIC codes relating to ecology, biodiversity or conservation and SIC codes relating to animals are focused on farming and veterinary services. Although environmental consulting is broader than ecology

<sup>73</sup> Prospects. [Environmental consultant](#)

alone, it is thought to be the best industrial classification to capture these jobs, which are important to the region.

Employment in environmental consulting in WECA reached a high of 440 in 2018<sup>74</sup>. The sector will need to grow significantly in order to ensure nature and the environment are protected as the region strives for net zero in 2030. Employment in environmental consulting requires a degree in either environmental science, environmental studies or a related subject such as ecology, biology or agricultural science. It is becoming more common for employers to require a postgraduate degree and experience working in the environmental sector for graduate positions<sup>75</sup>. These jobs require a high qualification level, at the minimum NVQ level 6 as well as experience. There are undergraduate and postgraduate courses offered at both The University of the West of England and The University of Bristol which would provide the qualifications required for employment in environmental consulting. These universities give the region a strong advantage in growing this sector, therefore there are unlikely to be skills gaps in terms of the qualifications of graduates.

Bristol has further opportunities for career development in the environmental sector, with the head offices of both The Soil Association (see Box 2) and The Environmental Agency based in the city. The Soil Association offers volunteering opportunities<sup>76</sup>, helping prospective environmental sector employees gain the experience needed for employment. The main challenge for WECA will be ensuring young people interested in this field are aware of the broad range of opportunities in the region.

### **Box 2: The Soil Association**

The [Soil Association](#) was formed in 1946 and is a membership charity that campaigns for healthy, humane and sustainable food, farming and land use. The Soil Association developed some of the world's first organic standards and continues to develop [standards](#) today. Through [Soil Association Certification](#), the Soil Association provides organic businesses with technical advice and support.

### **Sector 3: Engineering**

Engineering skills are vital in lots of the sectors discussed in this report, including all forms of low carbon electricity generation, low carbon transport, alternative fuels and low carbon heat. While lots of the technology design for renewable energy, electric vehicles, alternative fuels and heat pumps will take place outside of WECA, we expect nuclear and low carbon aerospace design to happen at least partly within the region. Beyond technology design, engineers will be required for site design, installation and maintenance of a broad range of infrastructure.

Solar farms provide one example of the range of engineering skills needed. Different skills will be required for different phases of a large-scale solar project, including design, construction and grid connection. The farm design must maximise the efficiency of the site

<sup>74</sup> ONS. (2020). [Business Register and Employment Survey](#)

<sup>75</sup> National careers service. [Environmental consultant](#)

<sup>76</sup> The Soil Association. [Volunteer](#)

given the financial and technical constraints. Construction of foundations and installation of the supports maximises the lifetime of the project and reduces time spent installing panels if done correctly. Electrical engineering skills are necessary to connect the solar farm to the grid and ensure it is operating correctly. Finally, engineers may be required in the monitoring and maintenance of the asset, continuing to ensure it is functioning as expected.

Engineering skills are also needed in low carbon heat. For example, heat networks will require engineers to design the network that connects properties to the heat source and ensure the heat source meets peak heat demand. A heat pump installer will need to carry out heat loss calculations and have an understanding of efficiencies in order to correctly size both the heat pump and radiators for high performance. Engineers will be required across the whole value chain. However, these low carbon heat examples have been selected due to their relevance to the region.

A broad range of engineering courses are offered at universities within the region, including the University of Bristol and the University of the West of England. Some of the most relevant courses to the low carbon sector include:

1. Civil Engineering
2. Electrical and Electronic Engineering
3. Engineering Mathematics
4. Mechanical Engineering
5. Engineering Design
6. Architecture and Environmental Engineering
7. Automotive Engineering

Ensuring there are sufficient engineering skills to meet net zero will be a significant challenge for WECA. On a national scale, engineering skills shortages have been identified and employers have raised concerns about their employee's ability to deliver net zero. In 2020, The Institution of Engineering and Technology conducted a survey to understand the skills needed for a green recovery. In total 1,010 senior decision makers from engineering employers completed the survey. The survey found that almost half (47%) of engineering employers had difficulty recruiting people with the right skills and 46% had difficulties with the skills in their internal workforce. However, they expected these problems to reduce with projected difficulties in recruitment and internal skills gap falling to 38% and 34% respectively in five years' time.

The IET survey also identified technical skills which applicants were lacking. Specialist skills/knowledge needed for the role was identified as the biggest skills gap as shown in Figure 16 below, with 68% of employers citing this problem.

## Top five types of technical skill lacking in applicants:

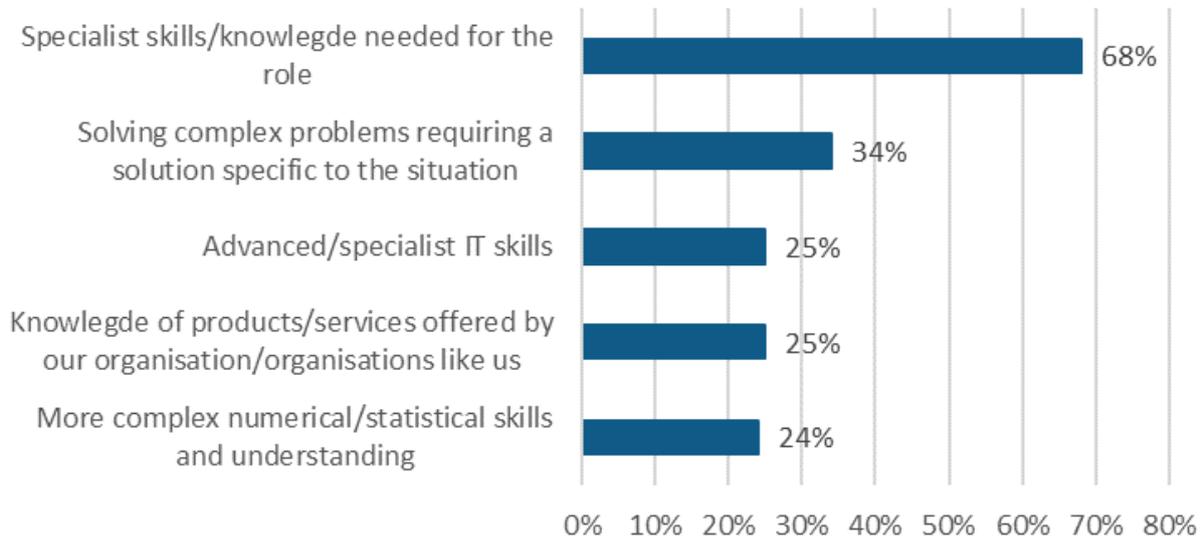


Figure 16 - The Top Five Technical Skills Lacking in Engineering Applicants. Adapted From: [Skills for Net Zero and a Green Recovery](#)

The most commonly cited soft skills gaps in this survey were team working, leadership and management skills when engineering companies are recruiting<sup>77</sup>. While this report highlights the scale of the challenge in ensuring there are adequate engineering skills to meet net zero, employers also gave recommendations. For example, 58% stated that increased engagement between education and business would help to improve the work-readiness of new recruits. Additionally, half of employers thought that education should prioritise more opportunities for work experience. Supporting the links between engineering firms and the education system is one of the ways WECA can help address these engineering skills gaps.

The relevant sections below provide a more detailed insight into two of the key 'engineering' sectors within the region: Nuclear and Aerospace.

### *Nuclear*

Demand for Nuclear Skills may be within many aspects of the Nuclear sector including existing generation, decommissioning, nuclear defence and civil new build. However, according to the Nuclear Workforce Assessment, civil new build has the greatest impact on demand and as a result, the projected skills shortfall is largely dependent upon the size of the pipeline. Under the **minimum expected pipeline** which consists of three active projects (Hinkley Point C, Sizewell C and Bradwell B), there is a cumulative recruitment across a range of areas within Levels 1-8 (See Figure 17 and Table 5).

<sup>77</sup> The IET. (2020). [Skills for net zero and a green recovery](#)

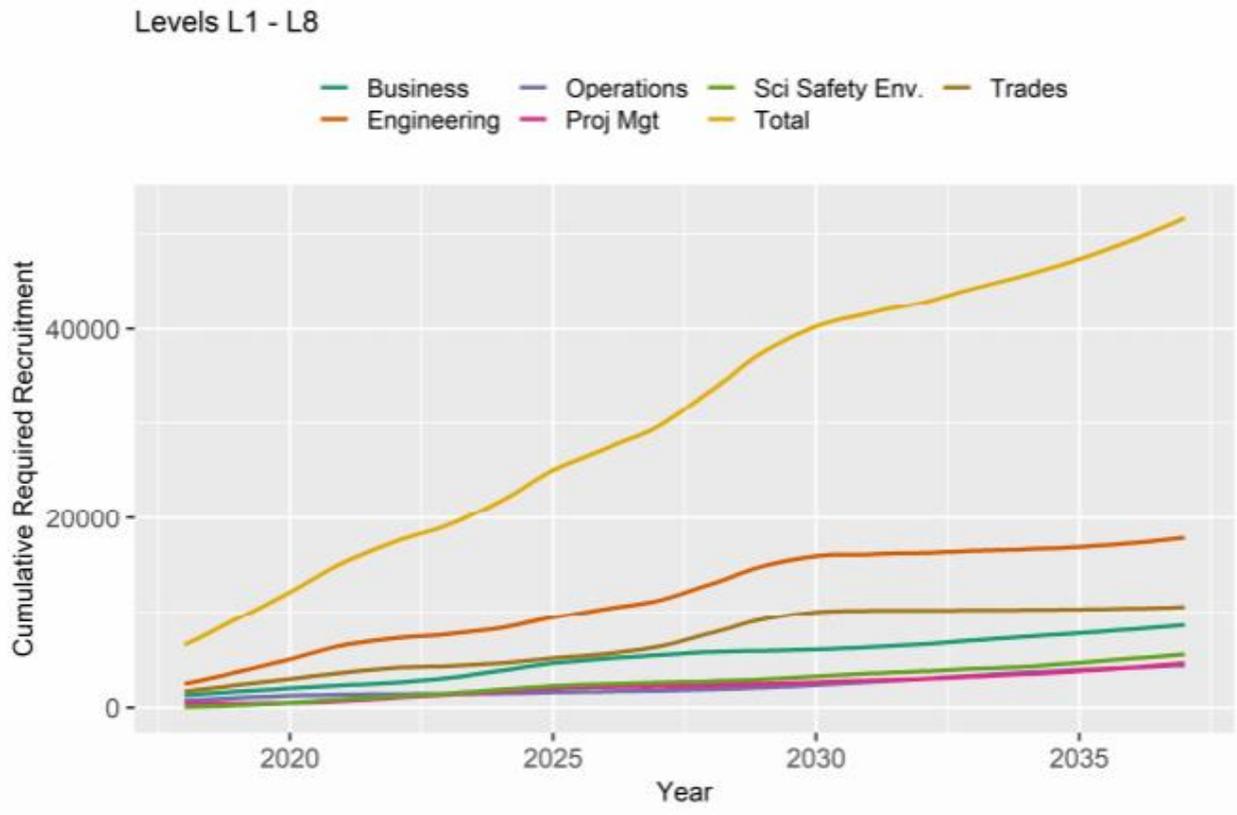


Figure 17 – Cumulative Inflow Requirement to Match Demand from Workforce Replacement and Required Expansion. Source: [Nuclear Workforce Assessment](#). [It should be highlighted that the use of a cumulative graphic disguises the fact that recruitment requirement fluctuates over time, particularly within certain business functions.]

Table 5 - Average Required Inflow Per Qualification Level (FTEs/Year) Under the Minimum Expected Pipeline Source: [Nuclear Workforce Assessment](#).

Timeframe	All Levels	Level 1 and 2	Level 3 and 4	Level 5 and 6	Level 7 and 8
2018-2025	3200	880	1070	950	300
2018-2027	2950	830	1050	810	260

Whilst the projected growth is significant, it must be noted that under the minimum expected pipeline scenario (Hinkley Point C, Sizewell C and Bradwell B), the peak demand would shift quite significantly from the South West to the South East within the decade. Uncertainty surrounding the future pipeline and therefore the skills demand ultimately leads to a lack of willingness locally to invest in training the future workforce.

GEOGRAPHICAL DEMAND FOR SKILLS

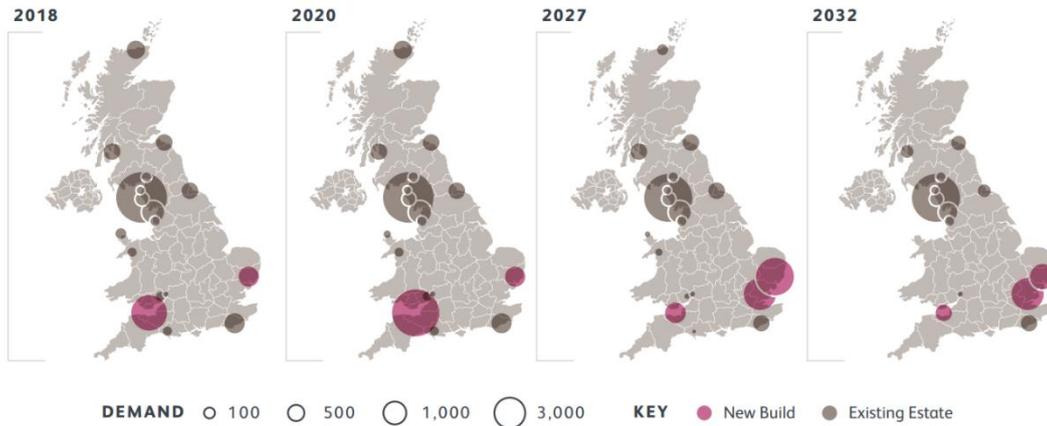


Figure 18 – Skills Demand by Geographical Location Source: [Nuclear Workforce Assessment Executive Summary](#).

In order to meet the skills required for the transition, there are three key routes; the existing workforce, the trainee workforce and transfers or ‘experienced hires’. Current recruitment activity is dominated by ‘experienced hires’. (See Figure 19).

Recruitment into the civil nuclear sector (2018)

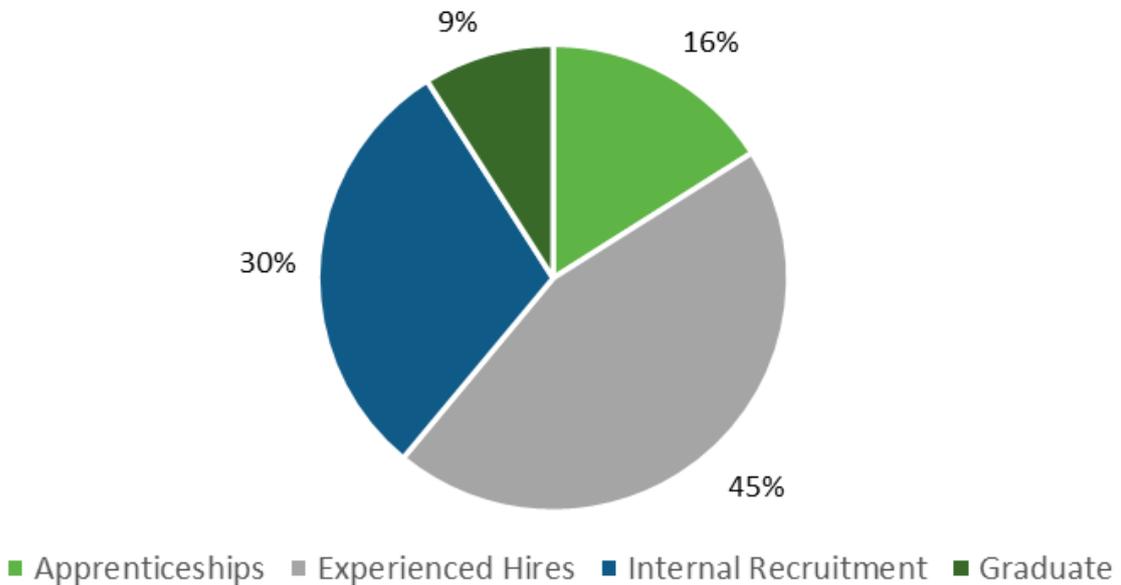


Figure 19 - Annual Recruitment Data by Recruitment Category for a Sample of UK Industry. Adapted From: [Nuclear Workforce Assessment Executive Summary](#).

There is indication that good progress has been made in recruitment from other talent pools within the nuclear sector, including from coal to nuclear, to enable skill retention within the

power sector; as of 2019, 60% of new recruits were from outside the sector. One success story in this regard relates to Cottam Power Station (See Box 3).

### **Box 3: Cottam Power Station**

The [Engineering Construction Industry Training Board's](#) (ECITB's) Accelerated Experience and Learning Programme (ALEP) was used to provide a route to the Nuclear Industry from the Wider Construction Sector. In February 2019, EDF announced that it intended to cease generation at its Cottam Coal Power Station but acknowledged the importance of ensuring the workforce was offered the opportunity to transition to other roles. The ALEP programme was used to help employees build upon existing operational skills as well as more generic knowledge and skills to help support individuals into new roles within the Nuclear Sector including Operator Technicians, Maintenance Technicians and Desk Engineers. Further details are contained within the [Nuclear Skills Strategy Group's Briefing](#).

The importance of upskilling the existing workforce in ensuring a just transition was highlighted in a recent Oral Evidence Session for the Environmental Audit Committee's Inquiry into Green Jobs<sup>78</sup>. In other markets, such as France, certain employers are obliged to support redundant employees, including through upskilling. Further details of this policy are provided in Box 4.

### **Box 4: The French Labour Code Amendment Relating to the Professional Employment Security Contract**

An employer with greater than 1,000 employees in France that is planning to announce redundancies is required to offer each employee a redeployment leave to enable them to make use of redeployment retraining and reskilling opportunities or a job search programme, which are services provided by a so called 're-employment' unit. Further details of

French Redployment Leave are contained on the [relevant webpage](#) of the European Monitoring Centre on Change (EMCC's) website.

There has been some success in terms of encouraging new entrants to the sector in recent years with the trainee population, including graduates, increasing by 20% between 2017-2018. However, there have also been shortfalls, with a 25% reduction in reported apprenticeships over the same period. The reduction in apprenticeships is perceived to be a significant issue given that this is one of the main routes for increasing diversity; according to the 2019 Nuclear Workforce Assessment, 1/5 of the sector is aged 55 or over and only 20% of the workforce are women. However, the Plan for Jobs and schemes including Kickstart, Apprenticeships, Bootcamps and Restart detailed on page 14 may help to encourage more young people and women into the nuclear sector.

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<sup>78</sup> House of Commons. (2021). [Environmental Audit Committee – Oral Evidence: Green Jobs and the Just Transition](#).

Broadly speaking, there is an insufficient supply of the skills required within the existing employment market. The Nuclear Workforce Assessment outlines a range of ‘fragile skills’ that exist within the sector, where the demand versus the available supply is presenting a challenge.



Figure 20 - Fragile Skills within the Nuclear Sector According to the [Nuclear Workforce Assessment](#).

In general, the sector does have a relatively high skills base; a total of 44% of the workforce are in Level 4-8 roles and 13% are in Level 7 and 8 roles. However, moving forward, retaining Subject Matter Experts is deemed to be particularly important, with higher level skills particularly affected by the ageing workforce. The loss of highly skilled individuals from the sector could have implications for delivery. These individuals typically have greater than 10 years of experience within the sector and a high level of authority.

The emergence of technologies such as modular nuclear reactors (Table 1), will also result in the requirement for further upskilling of the workforce. There exists a requirement for the development of a culture of innovation, with a workforce capable of adapting to challenges. The scientific research workforce will be an important part of enabling this transition<sup>79</sup>. As highlighted by one respondent within the market research conducted, the University of Bath has a relationship with Hinkley Point C. The HPC Supply Chain Innovation Lab offers the opportunity to establish a platform to industry, policy makers and academics in the innovation of supply chains and provides an example of how a collaborative approach may unlock international thought leadership within the region. Further information is available on the [HPC Supply Chain Website](#)<sup>80</sup>.

Looking at what may be done to build the nuclear skills base within the region, it is important to consider that the specific skill requirements vary with the phase at which a given nuclear project is at (See Figure 21.)

<sup>79</sup> Nuclear Skills Strategy Group. (2019). [Nuclear Workforce Assessment 2019](#).

<sup>80</sup> HPC Supply Chain. (2021). [HPC Supply Chain Innovation Lab](#).

## Jobs during Hinkley Point C Construction

Some examples

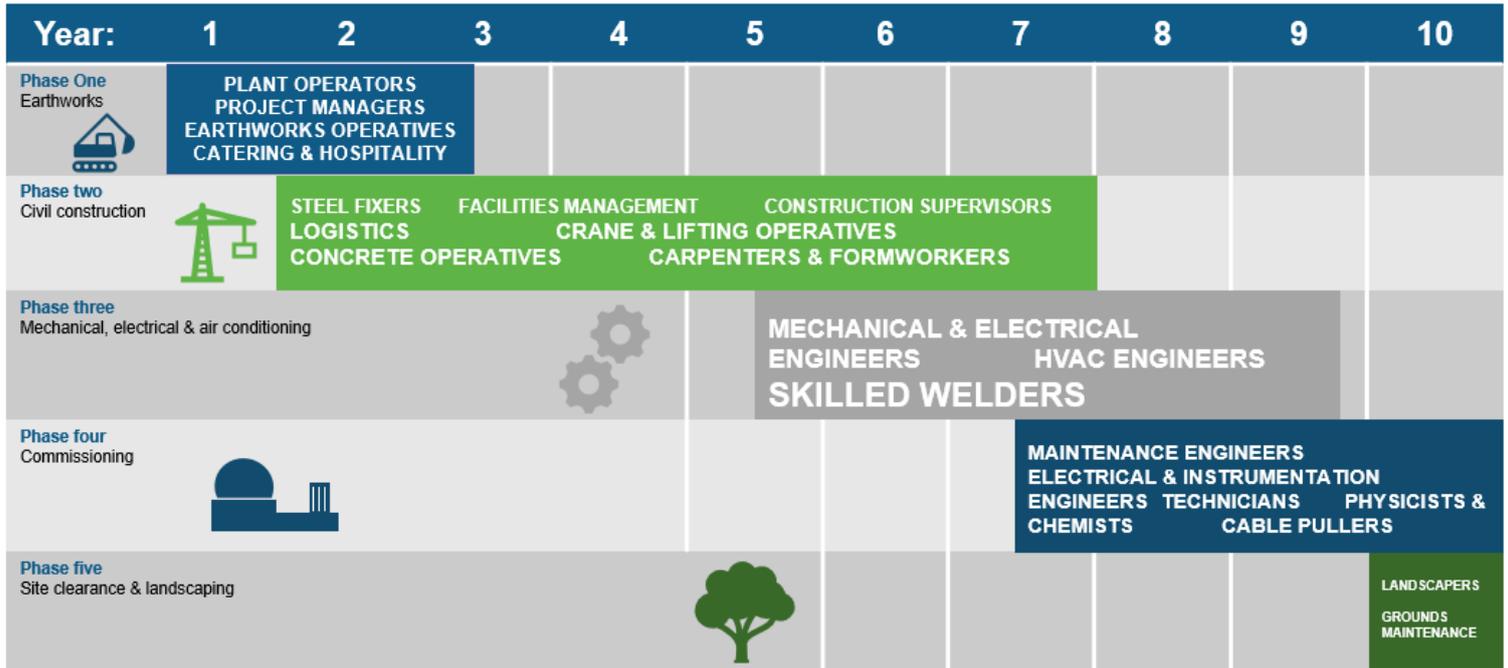


Figure 21 - Jobs During Hinkley Point C Construction. Source: [EDF Energy](#)

The roles involved in construction are fundamental between now and 2026, when electricity generation is due to commence. However, if no further plants are constructed within the region, as modelled within scenario one of the Nuclear Workforce Assessment, the skills requirement will shift from construction-based roles to operational roles.

Specifically, our conversations with industry partners who are working on HPC suggest that the supply of mechanical trades, engineers, electricians and welders is currently lacking in the region. The shortage of these roles across the UK appears to be a well- documented issue, with mechanical engineers, electrical engineers, and welding trades all on the 2020 proposed UK wide Shortage Occupation List, as advised by the Migration Advisory Committee<sup>81</sup>. Doosan Babcock is [working](#) to develop the mechanical, electrical and HVAC (MEH) elements of the build and reflected that whilst it has been able to access a satisfactory pool of civil construction workers, the demand for mechanical tradespeople – in phase three of Figure 21 – currently outstrips supply. Work has been underway to address this challenge; Doosan Babcock is part of the MEH Alliance which have worked with the Engineering Construction Industry Training Board (ECITB), the Weldability Foundation, the South West Institute of Technology and Bridgewater and Taunton College to tackle the UK skills shortage in welding through the development of a new welding centre of excellence in Bridgewater<sup>82</sup>.

<sup>81</sup> Migration Advisory Committee. [Review of the Shortage Occupation List: 2020.](#)

<sup>82</sup> Hinkley Supply Chain. [Hinkley Point C Hits It's Biggest Milestone Yet.](#)

Against the backdrop of other major infrastructure projects drawing from the same labour pool (e.g. HS2, Sellafield etc), attracting a number of skilled mechanical, electrical engineers and welders is a key challenge for the HPC project, and an opportunity for employment in the WECA region in the near to medium term.

Whilst the challenge faced in recruitment for HPC currently presents a challenge, the fact that recruitment from major infrastructure projects draws from the same labour pool indicates that there are key transferable skills across the infrastructure sector. There is perhaps potential for those involved in the construction of HPC to transfer to other green infrastructure projects within the region, once construction is complete.

Looking further ahead to plant operation roles, it is anticipated that a workforce of 900 people will be required to run HPC for its expected 60- year lifetime, according to EDF Energy<sup>83</sup>. A vast range of roles are required throughout the operational lifetime of Nuclear Plants and the Nuclear Skills Strategy Group have developed [role profiles for selected priority roles](#) within the sector which contain information about the knowledge, skills and behaviours required for each role, alongside a list of relevant qualifications. It is important to acknowledge that these role profiles only cover a selection of roles. Growth of the Nuclear Sector can lead to the creation of roles beyond those displayed in Table 6 including Project Management, Finance, Law and Public Relations and Communications.

Links to the profiles developed have been provided in Table 6. It is recommended that these profiles are consulted. However, general information about the route to becoming a Nuclear Engineer, an important role in the running of nuclear power stations,<sup>84</sup> has been provided below.

*Table 6 - Nuclear Sector Role Profiles Developed by the Nuclear Standards Advisory Group.*

Nuclear Sector Role Profiles	
Industrial Safety	<a href="#">Industrial Safety Manager</a>
Nuclear Safety Case Preparation	<a href="#">Safety Case Author</a> <a href="#">Safety Case Officer/Manager</a>
Health Physics	<a href="#">Health Physics Monitor</a> <a href="#">Radiation Protection Team Leader</a> <a href="#">Health Physicist</a>
Waste Management	<a href="#">Waste Management Operative</a> <a href="#">Waste Management Operations Team Leader</a> <a href="#">Waste Management Operations Manager</a> <a href="#">Waste Management Strategy &amp; Tech Services Manager</a> <a href="#">Waste Manager</a>
Cyber Security	<a href="#">Cyber Security Technologist/Analyst</a>
Decommissioning	<a href="#">Nuclear Decommissioning Operative</a> <a href="#">Nuclear Decommissioning Team Leader</a> <a href="#">Nuclear Decommissioning Engineer</a>
Laboratory Operations	<a href="#">Laboratory Technician</a>

<sup>83</sup> EDF. [Jobs and Training at Hinkley Point C.](#)

<sup>84</sup> National Careers Service. [Nuclear Engineer.](#)

	<a href="#">Research &amp; Development Technician</a> <a href="#">Analytical Technician</a>
Nuclear Maintenance	<a href="#">Nuclear Maintenance Technician</a> <a href="#">Nuclear Maintenance Fitter</a> <a href="#">Nuclear Maintenance Team Leader</a> <a href="#">Nuclear Maintenance Project Engineer</a> <a href="#">Nuclear Maintenance Senior Engineer</a>

According to UCAS Careers there are select pathways into becoming a qualified Nuclear Engineer<sup>85</sup>. These include having an HNC/HND, a foundation degree or undergraduate degree, with some employers also looking for postgraduate qualifications. Currently, only a small number of universities host nuclear specific courses. However, degrees in Chemical Engineering, Mechanical Engineering, Maths, Physics and Electrical Engineering are typical academic backgrounds for Nuclear Engineers.

Beyond graduation there are typically one-to-two-year graduate training programmes aimed at training graduates in the nuclear sector, to enable individuals to qualify for permanent positions. EDF Energy, who own Hinkley Point C, situated just south of the WECA region, are one of the largest and most well recognised providers of these graduate programmes<sup>86</sup>. EDF Energy provide intensive 16-month training programmes in the following areas:

1. Civil Engineering
2. Electrical and C&I Engineering
3. Material Science and Metallurgy
4. Maths
5. Mechanical Engineering
6. Physics
7. Chemistry

The locations for these training programmes are widespread but largely focus on the South West of England and include centres in Bristol, Gloucester and on site at Hinkley. At the end of the programme, graduates are expected to join the Hinkley Point C project at location. In addition to Nuclear Graduate Programmes, there are also opportunities for individuals to join the sector via an Apprenticeship Scheme. The National College for Nuclear hosts apprenticeships without degree level pre-requisites<sup>87</sup>. NCFN has two sites, and its 'Southern Hub' (Bridgwater & Taunton College) is located near Hinkley Point C, just south of Weston-Super Mare. In addition to apprenticeships, the college runs several nuclear specific engineering degrees and higher education equivalents.

The University of Bristol is also one of the few universities to offer nuclear specific postgraduate engineering degrees, including an MSc in Nuclear Science and Engineering<sup>88</sup>.

<sup>85</sup> UCAS. [Nuclear Engineer.](#)

<sup>86</sup> EDF. [Engineering Graduate Programme.](#)

<sup>87</sup> NCFN. [NCFN Courses.](#)

<sup>88</sup> Bristol University. [MSc Nuclear Science and Engineering.](#)

Owing in large part to the ongoing construction of Hinkley Point C, the surrounding regions, including the WECA region, have been established as a strong training hub for nuclear graduate and apprenticeship programmes. This will help to provide for the future high level job demand of Hinkley Point C and other future potential nuclear sites in the region.

Box 5 provides a case study of an apprentice from near Bridgwater who started his career path at Hinkley Point C in 2014 and has progressed up the career ladder<sup>89</sup>.

#### **Box 5: Case Study: Progression within the Nuclear Sector**

Garth at Hinkley Point C in 2014 as a steel fixing apprentice and has progressed to a construction manager, now overseeing a team of over 100 people. His career path is documented on the [EDF Website](#) and an extract is provided below.

“Following successful completion of his steel fixing apprenticeship, Garth joined the Bylor team as a qualified steel fixer in 2016. Just one year later Garth was promoted to the role of steel fixing supervisor at Hinkley Point C in recognition of his expertise and dedication to high-quality steel fixing on site.

Garth again climbed the career ladder in December 2019 when he was promoted to the role of construction manager for Bylor’s prefabrication yard, managing a team of over 100 people, including steel fixers, carpenters, drivers and crane crew.”

As noted previously, a specific challenge faced by HPC and nuclear industry in the WECA region is in attracting a pool of skilled mechanical, electrical engineers and welders to work on the project. There could be several solutions to this, including the continued offering of apprenticeships and retraining courses to bring new entrants into the industry, but also the upskilling of the current civil trades workforce who have worked on the construction of the site. The HPC project would stand to benefit from a pool of workers that have already helped develop the civil construction element of the project. The workers could benefit from a set of skills that will be in demand as other nuclear projects are developed across the UK – though not necessarily in the WECA region. WECA could play a role in offering targeted support for these skills gaps, either through outreach to potential participants, or the development of specific skills programmes and funding.

Approximately half of those working at Hinkley Point C are from the local area<sup>90</sup>. Ensuring that local people have the skills required will be valuable in enabling them to benefit from the opportunities posed by such a major infrastructure project. EDF is working to support opportunities for local people within the region<sup>91</sup>. However, it is important that there is a holistic approach to addressing skills gaps, composed of training provision as well as action to ensure role accessibility. A local industry representative highlighted that the relatively poor transport links to the area, as well as other employment barriers that may exist could impact the accessibility of roles to local people.

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<sup>89</sup> EDF. [Realising the Socio- Economic Benefits | Hinkley Point C.](#)

<sup>90</sup> Hinkley Supply Chain. [Hinkley Point C Hits It’s Biggest Milestone Yet.](#)

<sup>91</sup> Construction News. [Hinkley Point C: How the Megaproject Can Help Fix the UK’s Skills Shortage.](#)

## Aerospace

Aerospace is a significant sector in the WECA region, with a nucleus of 180 aerospace companies in the region, employing over 9,000 individuals in 2019. That said, very few of these employees could currently be categorised as working in the low carbon sector. This will need to change as the UK emissions from aviation reached 39.6 MtCO<sub>2e</sub>/year in 2019, roughly 8% of the UK's total emissions<sup>92</sup>. While the CCC suggests that reaching net zero will mean positive emissions in this sector due to offsetting, significant progress must be made to reach the emissions level required in their analysis (23 MtCO<sub>2e</sub>/year), particularly with the demand forecast set to increase.

Any emissions reductions in the short term will likely be achieved by demand management, efficiency improvements and sustainable aviation fuels (SAFs), with hydrogen and electric planes expected to come further in the future. Demand management is likely out of WECA's control and may take the form of increased carbon pricing on aviation to better reflect the external costs on the environment created by air transport. Emissions savings due to increased efficiency and SAFs will require a highly skilled workforce with a focus on STEM skills.

During an interview with a senior employee at a multi-national aerospace corporation, high qualification levels were identified as having skills shortages. The interviewee suggested that the majority of low carbon jobs in their organisation would come from upskilling the existing workforce who already have a specialism in aerospace. However, there was also the expectation of 10-20% growth in high qualification level jobs. The most difficult skills to recruit or develop internally were related to hydrogen and electrical systems, which is unsurprising due to the nascent nature of these technologies in aerospace. The Airbus respondent also suggested that promoting IT and STEM subjects would be key to reducing the skills gaps that will emerge in low carbon aerospace. This view aligns with a government consultation on low carbon skills which stated that new skill sets were needed in propulsion types and systems, advanced materials, fibre optics, photo electric cells and alternative fuels<sup>93</sup>.

According to the [Careers in Aerospace Website](#), whilst the majority of roles are engineering based, aerospace companies also recruit individuals with degrees in Materials Science, IT, Business and Finance<sup>94</sup>. Looking at Aerospace Engineering specifically, courses are provided within the region at universities including<sup>95</sup>:

1. The University of Bath which offers an [MEng Aerospace Engineering](#), with an opportunity for industrial experience.
2. The University of Bristol which offers a [BEng Aerospace Engineering](#) and an [MEng Aerospace Engineering](#), with an opportunity to study abroad or gain industrial experience.
3. The University of the West of England (UWE) which offers [BEng Aerospace Engineering](#) and an [MEng Aerospace Engineering](#), with an opportunity for students to also complete their pilot studies. Interestingly, UWE also offer a Professional Short

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<sup>92</sup> The CCC (2020) [Sixth Carbon Budget - Charts and data in the report](#)

<sup>93</sup> DECC (2010) [Meeting the Low Carbon Skills Challenge – a Government response](#)

<sup>94</sup> Careers in Aerospace. [Airbus](#).

<sup>95</sup> What Uni. [Aerospace Engineering Degrees in the West of England](#)

Course in the [Aerospace Design Process](#) targeted towards those with a degree or equivalent in an Engineering related topic and workplace experience within the Aerospace Sector.

As noted previously, skills inflows and outflows are likely to occur, with individuals local to the region relocating for study and individuals coming to the region to study. This trend is likely to be particularly prevalent for universities; as part of the market research conducted, education providers were asked what proportion of their students are from the WECA region when they enrol to study and what proportion are then employed within the WECA region. A representative from a university based in the WECA region estimated that less than a quarter of students are from the WECA region and less than a quarter remain.

By contrast, Further Education (FE) Colleges in the region generally indicated that a greater proportion were from the region and remained there after course completion (greater than a quarter and above 75% in some instances).

Companies including Airbus run Graduate Programmes and Internship Opportunities for those who have undertaken or are currently undertaking Undergraduate Degree Programmes. Other entry routes include direct entry, apprenticeships (see Box 6)<sup>96</sup> and school lever programmes as well as experienced hires<sup>97</sup>. However, as highlighted within the

#### **Box 6: Case Study: An Apprenticeship in Aerospace**

Catherine worked briefly at Secondary Schools teaching Mathematics and Music before moving to France to teach English. Upon returning to the UK she ultimately decided to enroll on an apprenticeship. A case study about her career so far is available on the [Union Learn](#) website and an extract from the article (originally published in 2018) has been provided below.

“Catherine works full time at Airbus, with two days week at university during term time, and is working towards a degree in Aerospace Engineering with UWE (University of the West of England) and NVQ level 4 in Engineering and Advanced Manufacture through City of Bristol College”

“Catherine isn’t sure which direction she hopes to follow after finishing the scheme – but is keen to become a senior/ lead engineer, and [her company] has a mentoring scheme allowing her to talk to a mentor about plans and work out what training and experience needed to move into future roles.”

*Catherine said: “I feel very lucky to be able to do a job that I really enjoy, which also has a good career path, the opportunity to travel and live abroad and offers the progression that I would like.”*

interview conducted, it is thought that the majority of ‘low carbon’ jobs within aerospace could come from upskilling the existing workforce in the future.

<sup>96</sup> Union Learn. [Catherine’s Career Takes Off With an Airbus Apprenticeship.](#)

<sup>97</sup> Careers in Aerospace. [Airbus.](#)

## The West of England Institute of Technology (WEIoT)

The WEIoT has been developed to “equip people with the skills to fully participate in, and contribute to, economic growth driven by digital innovation and emerging technologies.”<sup>98</sup> By 2024, the region aims to deliver Science, Technology, Engineering and Maths (STEM) Led Education and Training to over 2000 individuals, with learners studying at least a Level 4 Qualification and over 96% of learners focused on technical disciplines. One of the core disciplines is Advanced Engineering and High Value Manufacturing and a range of colleges are collaborating within the space (See Figure 22).

### Advanced Engineering and High Value Manufacturing

Global engineering is changing, customers are looking for a low carbon option, shorter development times, quicker routes to market. Advanced Engineering and Manufacturing will need digitally enabled engineering for the future. All partners offer pathways to deliver Higher technical qualifications to this sector.

	Bath College	Yeovil College	UWE Bristol	Weston College	Glos College
Level 4					
Level 5					
Level 6					

Figure 22 – Advanced Engineering and High Value Manufacturing as Part of the West of England Institute of Technology. Adapted From: [WEIoT](#)

Facilities are being developed to support the sector across a range of sites and some of the initiatives of particular relevance to the Aerospace sector are listed below:

1. Yeovil College
  - a. Aerospace and Advanced Manufacturing Academy which will include a CAD suite and a research laboratory with a wind tunnel and materials testing rigs.
2. The University of the West of England (UWE Bristol)
  - a. Aerospace and Mechanical Engineering Laboratory, with electronic simulation systems.

#### Sector 4: Construction

The construction sector is critical to the decarbonisation of the built environment and ultimately, net zero. There is a need for construction workers in order to design, build and maintain major infrastructure, as well as conduct large scale new build and retrofit programmes to ensure the development of low carbon homes across the UK<sup>99</sup>. Phase 1 of this research project focused on the retrofit market specifically, and as such, this will not be

<sup>98</sup> West of England Institute of Technology. (2021). [WEIoT](#)

<sup>99</sup> IPPR. (2021). [Skills for a Green Recovery](#).

covered further within this report. However, it is important that challenges facing the construction sector more widely are considered.

A range of respondents across the retrofit and wider construction space, including both industry representatives and training providers, were interviewed as part of the market research conducted. Findings applicable to the retrofit sector have been covered within Phase 1 of this research project. However, findings applicable to the construction sector more widely have been summarised within this report.

According to the Institute for Public Policy Research, the entire construction industry is facing “large and persistent skills gaps and skills shortages” and this finding was echoed within our market research.

Construction Excellence SW (CESW) is an organisation which drives change within the construction industry in the South West and forms part of the Constructing Excellence Regional Pathway. CESW has an [innovation and sustainability thought leadership group](#) which brings together those interested in the subject.

In order to assess views within the construction sector more widely, attendees of a recent CESW Innovation & Sustainability Theme Group Meeting were asked about how they expect the sector to grow and, if applicable, at which qualification level they anticipated growth would be required. The feedback from the session has been summarised below.

*“What percentage growth in employment do you think will be needed for your company / sector in the next 5 years to meet the net zero target?”*

*The vast majority of respondents expected that between 0-50% growth would be required. However, unlike respondents within the retrofit sector, some anticipated that no growth would be required.*

*“Where will the job growth be (in terms of qualification levels)?”*

*Generally speaking, there was a view that growth would be required across all three qualification levels across the construction sector, with Intermediate (Levels 3 and 4) the most commonly cited option.*

*“Do you think the existing workforce in your sector is sufficiently skilled to deliver the goods and services needed for a low carbon economy?”*

*Most respondents held the view that the existing workforce has some of the skills required but that these need to be built upon. All respondents held the view that some level of recruitment and upskilling was required.*

According to a recent report by the Institute for Public Policy Research (IPPR), there is a belief amongst the construction sector that in terms of knowledge and technical capability, the construction workforce is capable. The report highlights that the so called 'skills gap' in the context of the construction sector refers to two distinct challenges<sup>100</sup>:

1. There is a gap between the number of workers required to build the infrastructure for net zero and the number currently within the workforce.
2. There is a need to transform the values and attitudes of those working within the sector as part of a wider cultural change.

Our expert respondents who were interviewed as part of the market research conducted provided further granularity and identified multiple challenges that were currently exacerbating the existing skills gap.

### *The Lack of Diversity within the Sector*

Attracting and retaining talent within the construction sector is seen as a significant challenge. In our research, it was expressed that the construction sector is currently seen as 'the employment of last choice'. In fact, according to a CITB report, only 28% of learners on construction courses in the 2015-2016 academic year joined the construction workforce six months later<sup>101</sup>.

Our respondents cited that there is currently a lack of diversity within the construction sector and this issue is widely documented within the literature. Respondents considered that the industry was male dominated with an ageing workforce. The ageing workforce presents a significant issue; recent analysis conducted by the IPPR found that up to 750,000 construction workers could retire or be on the verge of retiring over the next 15 years, with just 20.3 % of construction workers aged under 30<sup>102</sup>.

Further to this, it would take almost 200 years to achieve gender equality in the construction industry and, according to the Office for National Statistics (ONS) in Q4 of 2018, 5.4% of construction workers were from Black and Minority Ethnic (BAME) Groups<sup>103</sup>. Despite its size, the construction sector is one of the least diverse in the UK.

### *The Fragmented Workforce*

As highlighted in Phase 1 of this research, the construction sector is fragmented, with several different representative groups. SMEs form 99.9% of UK construction contracting businesses, whilst 40% of the UK construction workforce and 43% of the West of England construction workforce is self-employed<sup>104</sup>.

Further to this, the fluidity of the industry and the large proportion of short-term, sub-contracted work means that there exists minimal incentive for large employers to invest in skills development. The lack of demand for upskilling means there is little incentive for training providers to update their training offer, creating a cycle as depicted in the Figure below.

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<sup>100</sup> IPPR. (2021). [Skills for a Green Recovery](#).

<sup>101</sup> CITB. (2020). [Further Education Learners into the Construction Workforce](#).

<sup>102</sup> IPPR. (2021). [Skills for a Green Recovery](#).

<sup>103</sup> GMB. (2019). [Construction Industry Just 12.5% Women and 5.4% BAME](#).

<sup>104</sup> West of England Combined Authority. (2019). [Construction: West of England Local Sector Skills Statement 2019](#).



Figure 23 - The Skills Deficit Cycle

### *A Lack of Investment*

There was a view that in order to adhere to higher standards of quality in the construction sector, further research and development and therefore investments are needed. One respondent highlighted that whilst research and development is conducted, to some extent, at the industry level, there is less research and development conducted at the wider sector level. Inadequate investment in infrastructure within the UK is a well-documented issue. As outlined in the IPPR's recent report, the UK faces an infrastructure investment gap.

This lack of investment also extends to skills and employment. According to research conducted by Hochlaf and Quilter-Pinner and published in the IPPR's report, an additional £6 billion of revenue funding is needed just to keep the further education sector alive<sup>105</sup>.

### *A Lack of Accountability*

As highlighted within the Phase 1 report, there is a challenge associated with accountability within the construction sector more widely. This was highlighted in the Hackitt Review, commissioned following the Grenfell Tower tragedy which noted that "there is ambiguity over where responsibility lies." There is a need to ensure that individuals are held to account but crucially, they must first demonstrate competence. As such, there is a requirement to ensure that training programmes deliver the competencies required.

Our expert respondents indicated that the perspective of the built environment needs to change and cited a range of opportunities for transformational change within the sector. Whilst construction may currently be seen as a low skill sector, the net zero agenda presents an opportunity for the construction sector to re-brand itself by committing to climate action and selling the construction sector as an opportunity for climate conscious young people to make an impact on the route to net zero. This was caveated with the fact that the construction sector will be competing, over the next 10 years, with other sectors, such as engineering and energy, looking to recruit talented people and transform and grow as a result of net zero.

<sup>105</sup> IPPR. (2021). [Skills for a Green Recovery](#).

### **Box 7: The Changing Perception of the Construction Sector through Covid-19**

In 2020, a report was commissioned to [assess the impact of Covid-19 on construction](#); there was indication that a range of changes have been made to working practices across six sites investigated, which, if maintained, could have a positive impact on the sector, long term.

1. A greater proportion of time is spent on planning work tasks, with workers typically deployed in smaller groups than usual and trades working in sequence as opposed to side by side. According to the research conducted, this has led to greater worker effectiveness and productivity.
2. Changes made to the induction process and to welfare and hygiene arrangements were reported in response to the Covid-19 pandemic. According to the research conducted, these changes have the potential to improve workforce safety, wellbeing and motivation if adopted long term.
3. Increased use of digital technologies to conduct remote meetings and virtual site visits has arisen as a result of the Covid-19 pandemic and this is reported to have been successful. Adoption of technologies longer term could unlock long term cost savings, improved productivity and enhanced engagement.

Modern Methods of Construction (MMC) was also cited as a growth opportunity for the built environment. There is some ambiguity surrounding what MMC encompasses, with some placing a greater emphasis on off-site manufacturing and modular systems, and others placing a greater emphasis on the role of digitalisation and digital technology<sup>106</sup>. In any case, the demand for IT and communications skills is likely to grow within the sector.

The shift to MMC and Sustainable Building will have skills implications. In the transition to sustainable building, there is a need to enable people to move from traditional brick and block to timber frame. There is also a need to upskill on site labour including insulation, cladding, electricians, plumbers and renderers. The advent of digital technologies provides a potential opportunity to grow the construction sector by creating other job opportunities, using digital skills and Building Information Modelling (BIM) that may engage young people. In addition, there may be some skills transfer to factory-based settings with the growth of Modern Methods of Construction (MMC).

Whilst MMC presents a great opportunity for the sector, there is a potential risk that the shift to off-site construction could reduce jobs within the region if manufacturing sites are not located within WECA or if increased automation reduces skill requirements. It is therefore important that young people are provided with the skills required to work with digital technologies and adapt to a changing sector. In terms of the geographical location of manufacturing sites, there was some evidence within our market research that a 'Hub and Spoke Approach' may be considered, with the development of temporary factories in local areas managed by a centralised hub.

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<sup>106</sup> House of Commons. Housing, Communities and Local Government Commitment. (2019). [Modern Methods of Construction](#).

Work is underway, both within and outside of the region, to address some of the challenges facing the sector and capitalise on the growth opportunities presented within the sector. In 2019, WECA invested £150,000 to support a pilot programme to trial Modern Methods of Construction (MMC)<sup>107</sup>. In addition, WECA is a Founding Partner and Supporter of Bristol Housing Festival, a five-year project, hosting an ongoing conversation in various forms to incubate and pilot new ideas, with the goal of finding scalable solutions. A key part of Bristol Housing Festival is the extensive range of events, round table discussions and public exhibitions hosted, focused on the latest innovation in off-site manufacturing solutions and MMC<sup>108</sup>.

Whilst there are a range of providers of construction courses in the region, a current project to note is underway at City of Bristol College. The College is due to open an [Advanced Construction Skills Centre](#) in September 2021. Designed to meet sector skills needs, as well as widening participation and access to state-of-the-art construction facilities, the centre will deliver higher apprenticeships and courses for young people as well as qualifications for professionals already working in the field.

Provision at the centre will also be made for more traditional training routes to service the large number of building firms and small traders located in the south of the city. The total cost of the project is £9m, with £6m coming from the West of England Local Enterprise Partnership (LEP) through the Local Growth Fund, administered by the West of England Combined Authority (WECA)<sup>109</sup>.

Nationally, the Skills Bootcamp Programme may be valuable to the sector and will provide adults with free, flexible courses of between 12-16 weeks in length. Skills Bootcamps are available to enable individuals to develop digital and technical skills<sup>110</sup>, with a specific Construction Bootcamp. Although there isn't currently a Skills Bootcamp in the West of England Local Enterprise Partnership (LEP), Skills Bootcamps will be expanded into other areas in 2021. Expansion will be supported by investment of £43 million from the National Skills Fund which will support both greater course availability and a wider range of course subject areas.

With increasing digitalisation of the sector, it is also important to consider programmes in place to develop digital skills within the region. WECA is running a range of initiatives to develop Digital Skills within the region. Further information is provided in the Digital section of the report. However, a key programme will be the £2 million [Digital Skills Investment Programme](#) (DSIP).

Construction Excellence is seeking to support a cultural change and is working on a Level 5 Diploma for Collaborative Working (due to launch in April). Historically, the Collaborative Working Academy (CWA) delivered training for predominantly Level 5 Qualifications in

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<sup>107</sup> WECA. [Investing in Modern Methods of Construction.](#)

<sup>108</sup> Bristol Housing Festival. [About Bristol Housing Festival.](#)

<sup>109</sup> WECA. [Positive Future for Construction Industry Work Begins on New Advanced Skills Centre.](#)

<sup>110</sup> UK Government. (2020). [National Skills Fund.](#)

collaboration and integration and its Diploma was first awarded in 2011. The training is now typically delivered as part of customised training programmes for academies<sup>111</sup>.

Whilst construction courses are provided by a range of institutions outside of the region, as well as within WECA, it is perhaps interesting to consider the work of the [Ministry of Building, Innovation and Education \(MOBIE\)](#). MOBIE is an educational charity comprised of a multidisciplinary team of strategists, designers, planners and educators that aims to connect young people with the construction sector. MOBIE has developed an educational pathway from BTEC through to post graduate. MOBIE's Higher Education HNC and HND courses in 'Home Design and Construction' and its units on the BTEC 'Construction and Built Environment' course have been written and validated in collaboration with Pearson, and meet the requirements of a range of professional bodies including RICS, CIAT, CIOB, CIBSE, ICE & ISE. Key careers include those listed below and the educational pathway is displayed in Figure 24.

1. Architectural Technologist
2. Architectural Designer
3. Digital Design Technician
4. BIM Technologist
5. Housing Design Technician
6. Off – Site Construction Manager
7. Planning Officer
8. Building Control Officer

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<sup>111</sup> Constructing Excellence. (2015). [Annual Report](#).

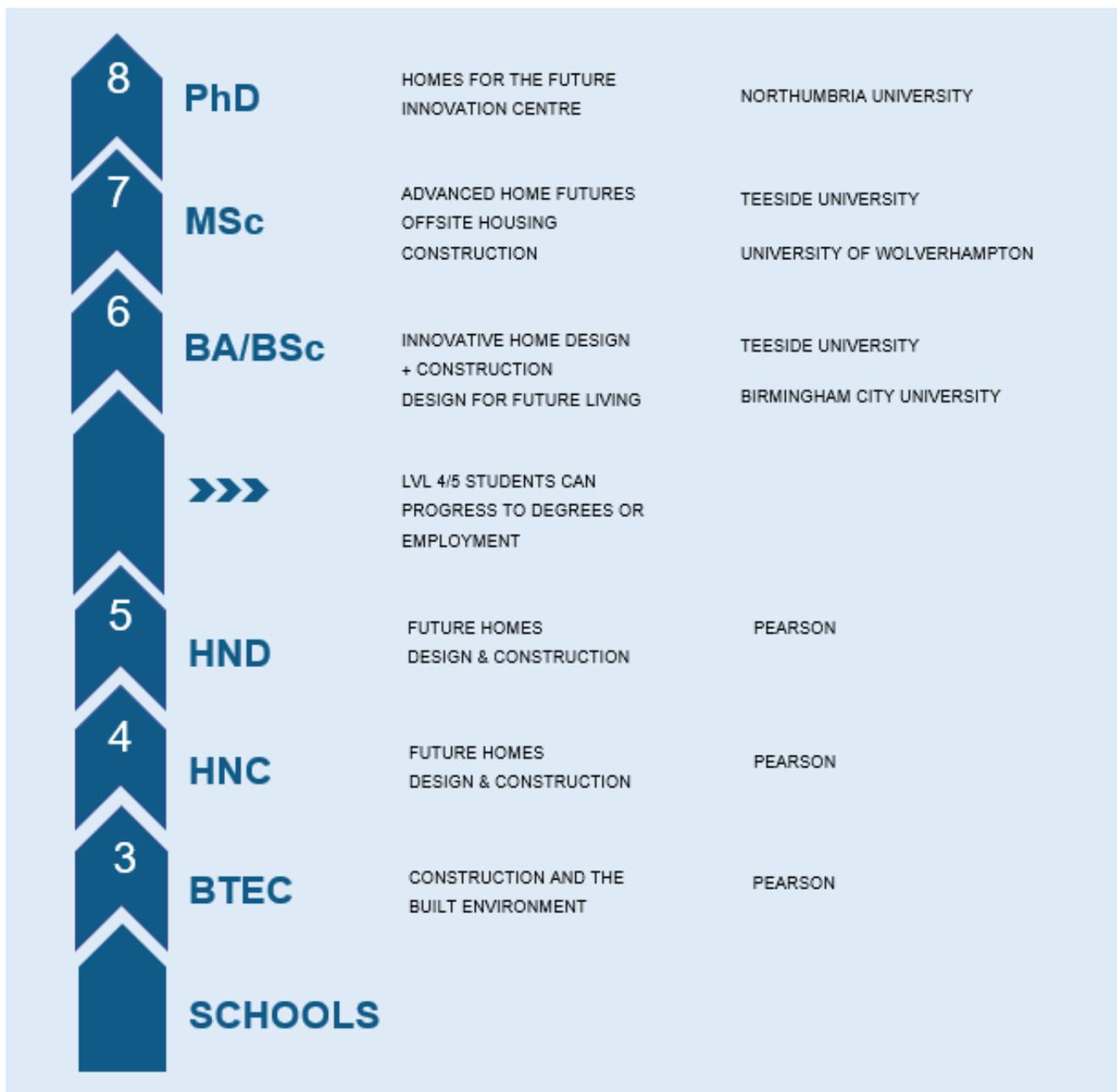


Figure 24 - The MOBIE Educational Pathway. Adapted From: [MOBIE](#)

## Sector 5: Electric Vehicle (EV) Charging Points

The National Grid has estimated (in July 2020, before the 2030 ban date was announced), that there would be 11 million electric vehicles on British roads by 2030 and over 30m by 2040<sup>112</sup>. This rapid shift from ICEVs to EVs will require a significant shift in infrastructure. As

<sup>112</sup> National Grid. (2020). [ESO Future Energy Scenarios](#).

it stands, over 35,000 EV charge points are already in place at present and over 7000 were installed in 2020 alone<sup>113</sup>. Assuming the adoption of EVs and the growth in the job market will take place uniformly across the country, job creation will be widespread and include the WECA region.

The majority of job creation associated with the introduction of EVs will be associated with the installation, operation and maintenance of EV charging points<sup>114</sup>.

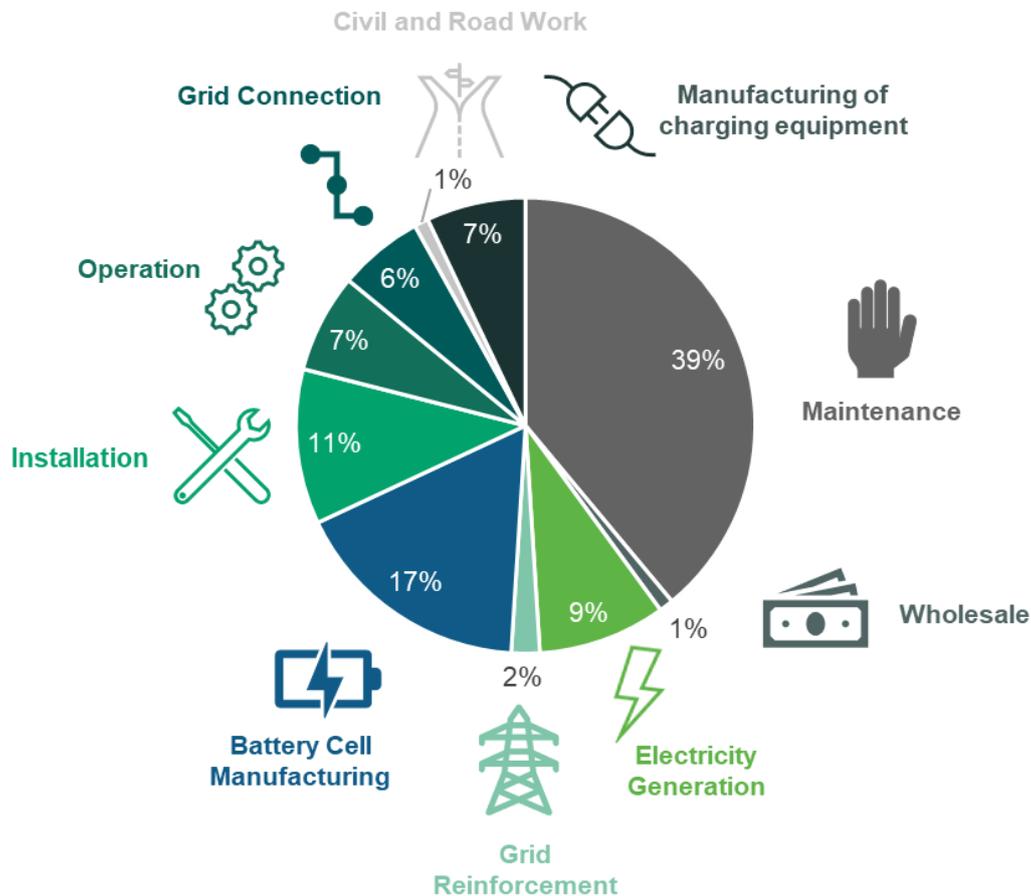


Figure 25 - A Breakdown of Potential Job Creation in the Electromobility Sector. Adapted From: [Europe On.](#)

According to a recent report published by Excellence in Electrotechnical & Engineering Services (ECA), a total of 74% of respondent organisations focused on Commercial EV Charge Points and 77% of respondent organisations focused on Domestic EV Charge Points indicated that their organisation does not always have sufficient access to skilled employees within these areas<sup>115</sup>, indicating that skills gaps exist within this area.

This is supported by another study which found that almost 70% of electricians do not feel that they have the skills and knowledge required in order to confidently install EV equipment, with key barriers to training including having insufficient time (76%) and the high associated

<sup>113</sup> EDF Energy. [Charging Points.](#)

<sup>114</sup> Europe On. (2020). [Powering a New Value Chain in the Automotive Sector](#)

<sup>115</sup> Excellence in Electrotechnical and Engineering Services. [Skills4Climate](#)

cost (46%)<sup>116</sup>. Despite this uncertainty, there is an opportunity for existing electrical engineers to upskill and develop the knowledge required to install EV charging points; in a survey of 379 professional electricians, 84% saw the shift to EVs as an opportunity for the sector as a whole<sup>117</sup>. Trained Electricians can become qualified to cover all areas of installation, maintenance and operation, building on the general electrical skills that they will already possess which include a knowledge and understanding of Electrical Safety Quality and Continuity Regulations, including surrounding circuit design and inspection as well as testing and certification<sup>118</sup>.

Key skill requirements for the EV sector include charge point market dynamics, charge point operations and maintenance and charge point payments<sup>119</sup>. There is indication that knowledge and understanding of elements within BS7671 concerning Electric Vehicle Charging Points and the Fourth Edition of the Institute of Engineering and Technology (IET) Code of Practice on Electric Vehicle Charging Equipment Installation is fundamental<sup>120; 121</sup>.

The National Inspection Council for Electrical Installation Contracting (NICEIC), an industry recognised contracting company, offers courses for BS 7671 certification. These courses do require some Electrician background pre-requisites but can be completed in a day (assuming previous Electrician experience) and come at a relatively low cost. The course is currently being offered in Bristol, situated within the WECA region<sup>122</sup>. The course outline is displayed in Figure 26 below.

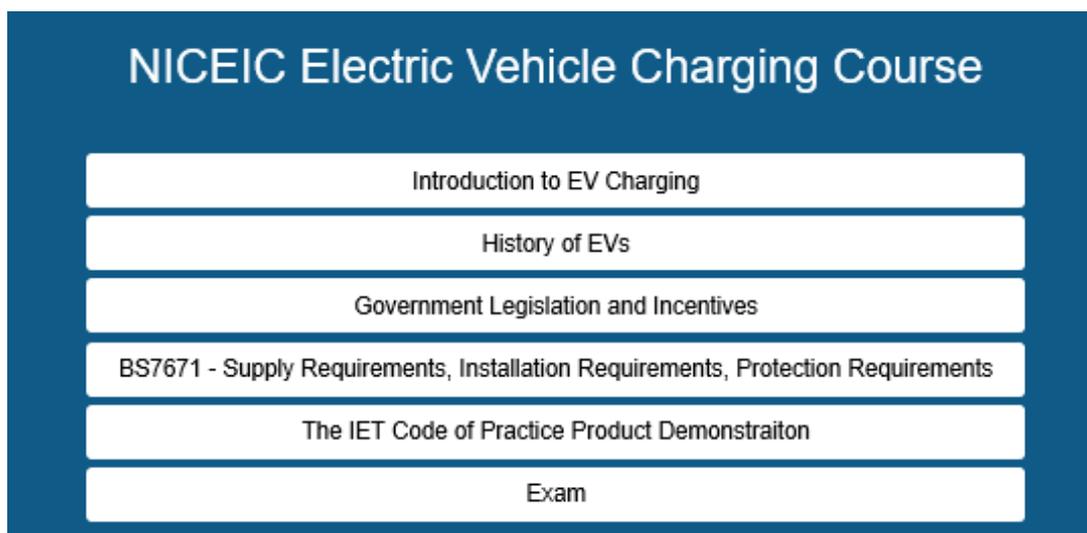


Figure 26 - NICEIC EV Charging Course Outline. Source: [NICEIC](#)

<sup>116</sup> Learning Lounge. (2020). [Nearly 70% of Electricians Feel Underprepared for the EV Revolution.](#)

<sup>117</sup> Learning Lounge. (2020). [Nearly 70% of Electricians Feel Underprepared for the EV Revolution.](#)

<sup>118</sup> NICEIC. (2021). [Electric Vehicle Charging Course.](#)

<sup>119</sup> The Association for Renewable Energy & Clean Technology. [Charge Point Professional Courses.](#)

<sup>120</sup> The IET. (2020). [The IET Code of Practice.](#)

<sup>121</sup> The IET. [BS 7671](#)

<sup>122</sup> NICEIC. (2021). [Electric Vehicle Charging Course.](#)

EV charge point installations can be categorised into home charge points, workplace charge points and on-street charging. Each charge point installation is supported by different government support schemes: EVHS (for home), WCS (for workplace) and ORCS (for on street). This helps to cover the installation cost for the EV owner, workplace or local authority<sup>123</sup>. One of the criteria for the eligibility for these schemes is for the installation to have been carried out by an 'Office for Low/Zero Carbon Electric Vehicles (OLEV/OZEV) approved Installer'<sup>124</sup>. The OLEV qualification is therefore another certificate well recognised by Electricians, with most charging point installation companies requiring all installers to be OLEV qualified<sup>125;126</sup>.

In order to become an OLEV registered installer, individuals must be qualified in EV equipment installation. There are two key routes: the first is an EAL Course and the second is a City & Guilds Course<sup>127</sup>. Courses are offered by electrical training companies such as EC4U (EAL Course) and Trade Skills 4U (City & Guilds Course).

Details of the City and Guilds Course are available on the [City and Guilds Electric Vehicle Charging \(2919\) Webpage](#), with information about both the Level 3 Award in Domestic, Commercial & Industrial EV Charging Equipment Installation (2919-01) and Level 3 Award In Domestic Electric Vehicle Charging Equipment Installation (2919-02). The EAL website contains information about the [EAL Level 3 Award in the Requirements for the Installation of Electric Vehicle Charging Points \(603/3929/9\)](#).

Focusing on the City and Guilds training provision as an example, currently, Trade Skills 4U appear to offer the C&G 2919-01 course at their sites in Coventry, Leeds, Warrington and Gatwick<sup>128</sup> and the C&G 2919-02 course at their sites in Coventry and Leeds<sup>129</sup>. The [C&G search function](#) was used to locate other centres offering the course near the WECA region and whilst the database is not exhaustive, other training providers located include [NAPITT Training](#) which offers the 2919-01 course in Bristol, [True Tech Training](#), situated in Cardiff which runs the C&G 2919-01 course and [South Wales Electrical Training](#), situated in Bridgend which runs the C&G 2919-01.

There is also potential opportunity to onboard new entrants to the market, with 31% of respondents to a recent Skills4Climate survey indicating that greater emphasis on EVs could be an opportunity to bring more young people into the engineering services sector<sup>130</sup>. The courses highlighted above are aimed at those already working within the electrotechnical sector<sup>131; 132</sup> but industry organisations, including Trade Skills 4U offer the opportunity for new entrants to first undertake electrical installer qualifications as part of an overall course package (See Figure 27). As part of the course, new entrants are first required to undertake

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<sup>123</sup> NICEIC. (2021). [Electric Vehicle Charging Course](#).

<sup>124</sup> Smart Home Charge. (2019). [Am I Eligible for the £350 Government OLEV Grant?](#)

<sup>125</sup> JoJu Solar. [The Electric Vehicle Revolution](#).

<sup>126</sup> EV Chargers. [EV Chargers](#)

<sup>127</sup> Learning Lounge. (2020). [How to Become an OLEV Registered Installer](#)

<sup>128</sup> Trade Skills 4U. [C&G 2919-01 EV/Car Charging Point Installers Course](#)

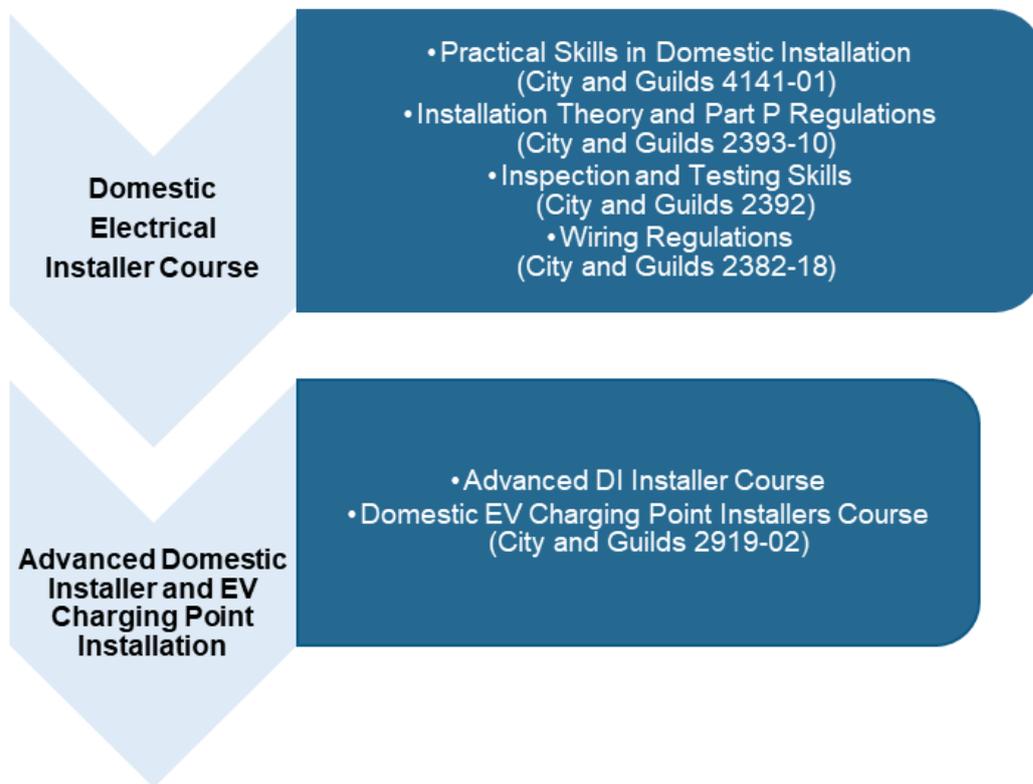
<sup>129</sup> Trade Skills 4U. [C&G 2919-02 EV/Car Charging Point Installation Course](#)

<sup>130</sup> Excellence in Electrotechnical and Engineering Services. [Skills4Climate](#)

<sup>131</sup> Trade Skills 4 U. (2021). [Domestic EV Installers Package](#).

<sup>132</sup> EC4U. (2021). [How to Become an OLEV Registered Installer](#).

the Domestic Electrical Installer Course, before progressing to the Advanced Domestic Installer and EV Charging Point Installation.



*Figure 27 - Domestic Electrician and EV Charging Package.*

It is interesting to highlight the potential career progression that may arise from such a course. To encourage continual training and development, a four-step programme has been developed to enable new entrants to the sector, who initially train as a Domestic Electrical Installer (with EV Charging) to become a fully qualified and registered electrician. Figure 28 displays the pathway which enables people to ‘step off’ the diploma programme and ‘step on’ once practical experience has been developed within the workplace. Whilst continuing along the pathway is not necessary to install EV Charge Points, such a pathway offers young people an opportunity to continually develop their skill set and may ultimately allow people to transition to the installation of other environmental technologies in the future.

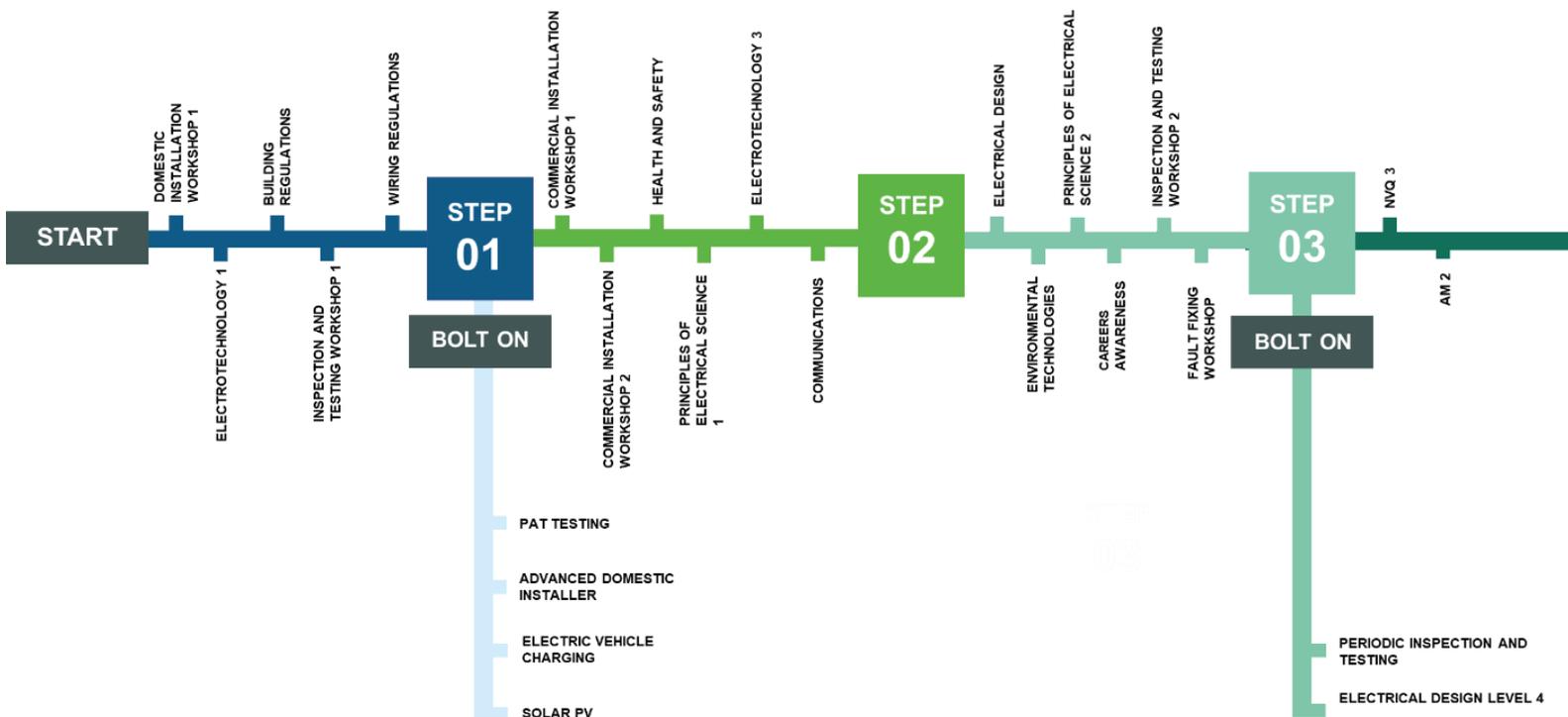


Figure 28 - Trade Skills 4U Programme. Adapted From: [Trade Skills 4U](#)

Further insight into the skills challenges faced by the automotive sector more widely were provided by an industry leader interviewed for this project. Our interviewee worked for a small, highly skilled company, where the majority of roles currently sit within the high qualification level (approximately 75%), with the remainder within the intermediate level. They anticipated that between 0-50% growth would be required over the next 5 years for their company specifically to meet the net zero target, with a focus on higher level roles. Whilst charging point installations provide an opportunity for electricians to upskill and enter the automotive sector, the respondent highlighted the importance of transitioning the existing automotive workforce. This may include enabling individuals who have trained in mechanical engineering towards electrical engineering; this is of particular importance given the shortage of electrical engineers that currently exists<sup>133</sup>.

According to our respondent, this is already happening to some extent, with conversion courses provided by companies such as Jaguar Land Rover (JLR), through its Lifelong Learning Academy. [WMG at the University of Warwick](#) is a key partner in the initiative and according to the CEO at JLR, the aim of the academy is to “maximise the talents of our workforce and give them new chances to develop their careers to the full.”<sup>134</sup>

<sup>133</sup> European Commission. (2019). [Analysis of Shortage and Surplus Occupations Based on National and Eurostat Labour Force Survey Data.](#)

<sup>134</sup> Warwick. [Jaguar Land Rover Launches Lifelong Learning Academy with WMG as Partner](#)

There is a skills demand across the qualification levels within the automotive sector, with one respondent active in the space indicating a demand for both highly trained graduates (Level 5 and Above) as well as Entry Level Apprentices (Levels 3-4). At a high level, recruitment of individuals with deep technical knowledge combined with business acumen was perceived to be particularly difficult at present.

As in the previous sections, work is underway within the region to support growth of the skills base. One of the key initiatives noted within the market research, that concerns the automotive sector more widely, has been highlighted below.

#### Institute for Advanced Automotive Propulsion Systems (IAAPS)

Construction of a £70 million automotive propulsion research facility has commenced as part of the Institute for Advanced Automotive Propulsion Systems (IAAPS). The facility is due to open in 2021 at the Bristol and Bath Science Park. The facility will be a great asset to the region and key to the growth of the low emission automotive sector within the region, and the UK more widely. A total of £10 million of funding was allocated to IAAPS through the West of England LEP, via the Local Growth Fund, provided by WECA<sup>135</sup>.

#### Sector 6: Solar PV

WECA has a good solar resource relative to the wider UK (See Figure 29) and this is an asset to the region<sup>136</sup>.

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<sup>135</sup> Rydon. (2019). [Bath Appoints Rydon as Contractor for New £70m Automotive Research Facility.](#)

<sup>136</sup> Solar GIS. [Download Solar Resource Maps and GIS Data for 200+ Countries.](#)

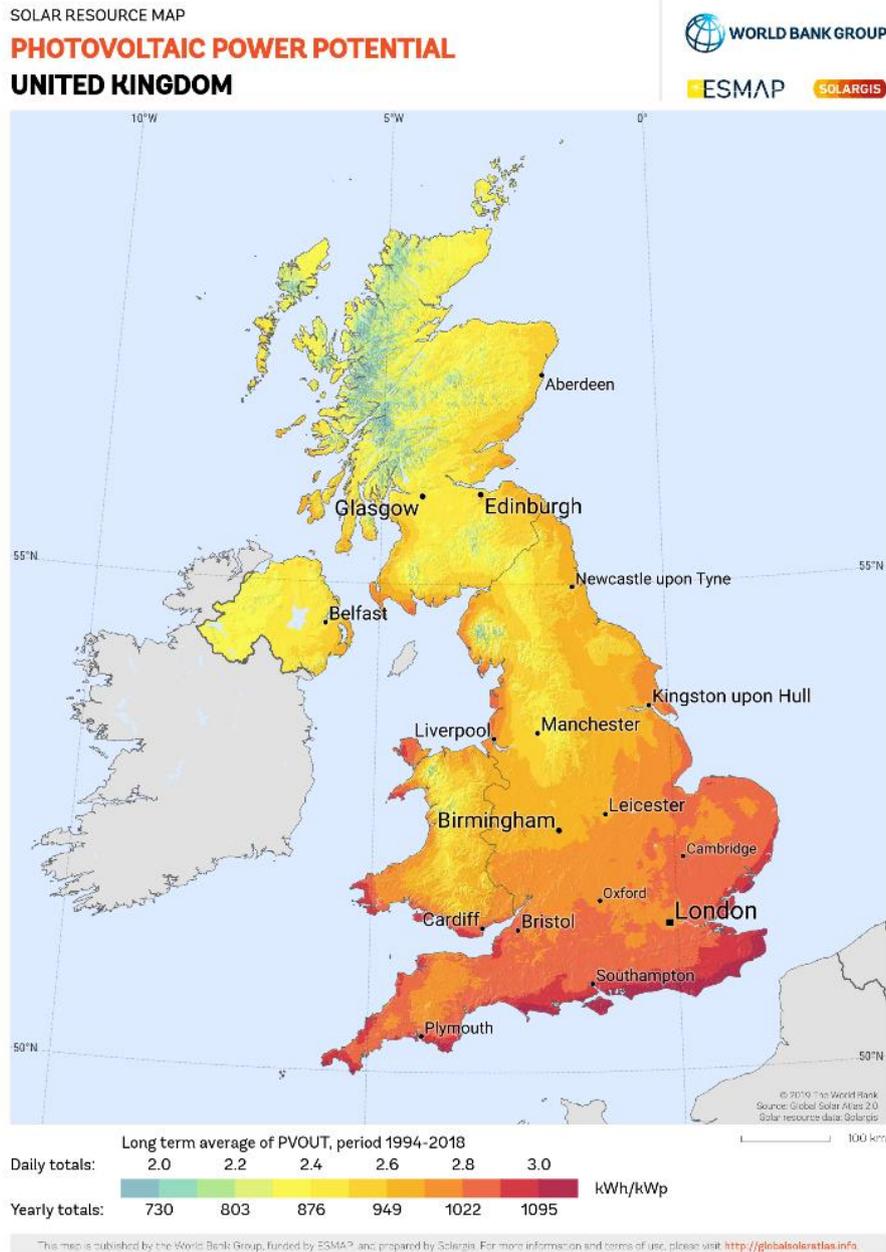


Figure 29 - PV Potential in the United Kingdom. Source: [Solar GIS](#)

Across the UK, household uptake of solar PV has increased dramatically over the past ten years, rising from under thirty-thousand solar PV sites in 2010 to over a million in 2019<sup>137</sup>. This rate of uptake has been determined by the falling cost of solar PV technology as well as supporting government grant schemes. However, the replacement of the Feed-in-Tariff (FiT) scheme (launched in 2010) with the less profitable Smart Export Guarantee (SEG) in 2019/2020 has been criticised, with some indicating that the SEG will be insufficient to motivate individuals to install Solar PV<sup>138</sup>.

<sup>137</sup> Statista. (2021). [Number of Solar PV Energy Generating Sites in the United Kingdom \(UK\) 2007-2019](#)

<sup>138</sup> Institute of Economics. (2019). [Comparing Renewable Schemes: FIT Vs SEG.](#)

The uptake of solar PV may start to increase again as the technology continues to fall in price and improve in performance. Other technologies such as home batteries, heat pumps and electric vehicles may help to support the value of Solar PV<sup>139</sup>. Forecasts from the International Energy Agency (IEA) predict that solar power costs will continue to reduce by 15% to 35% between 2020 and 2024, therefore increasing their financial attractiveness to households by the second half of the decade<sup>140</sup>.

With over 900,000 households now having solar PV installed nationwide, the job market for solar PV installation and maintenance has grown rapidly over the past decade and is now a significant sector<sup>141</sup>. Of central importance to households considering a solar PV installation is their eligibility for receiving electricity export payments via the SEG scheme - for when households are generating more electricity than they can use/store. Despite the fact that SEG is less profitable than the FIT scheme, payback times under the SEG are still significantly faster than without it<sup>142</sup>.

Jobs in domestic scale solar PV installation involve installation, maintenance and broader company logistics. The primary labour demand is focused on the installation process, with a single installation generally taking between one to two days and requiring two to four Installers (subject to the size of solar array and the property's readiness).

The installation procedure involves the following: erecting scaffolding, fitting roof hooks and frames, attaching and wiring the solar panels to the roof, connecting the solar panels to the solar inverter and grid, powering up the solar PV system, registering the system with the Microgeneration Certification Scheme (MCS) and providing the necessary documentation<sup>143</sup>. A job description of a renewable energy technician which includes a Solar PV Installer is displayed in Figure 30.

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<sup>139</sup> Solar Trade. (2019). [The UK Solar PV Market Outlook](#).

<sup>140</sup> Edie. [One Year On: How has the Solar Feed in Tariff Closure Impacted Renewables in the UK?](#)

<sup>141</sup> MCS Certified. (2019). [Solar Photovoltaic \(PV\)](#)

<sup>142</sup> Energy Saving Trust. [Smart Export Guarantee](#).

<sup>143</sup> Solar Guide. (2021). [Choosing a Solar Panel Installer in 2021](#).

Job purpose	Typical duties	Skills and knowlegde needed
<ul style="list-style-type: none"> <li>• Ensuring the efficient functioning of equipment that collects, generates or distributes power from renewable energy sources e.g. hydroelectric generators, wind turbines, solar panels</li> </ul>	<ul style="list-style-type: none"> <li>• Depending on site, includes:</li> <li>• assembly of heating and cooling mechanisms, system controls adjustments</li> <li>• repairing and testing equipment</li> <li>• identifying and reporting issues with particular systems and laying out and connecting electrical pathways</li> <li>• e.g. for solar photovoltaic installers: calculating potential power output based on the orientation of a structure toward the sun, designing the layouts of photovoltaic panels to collect the most solar energy and attaching panels to photovoltaic supports</li> </ul>	<ul style="list-style-type: none"> <li>• Strength to lift heavy equipment</li> <li>• Manual dexterity to manipulate tools</li> <li>• Problem solving and perception skills to identify and solve issues quickly</li> <li>• Understanding of complex detailed information</li> <li>• Ability to visualise outcomes occurring following modifications</li> <li>• Detailed knowlegde of tools, procedures and processes required, but covered through training</li> </ul>

Figure 30 - A Job Description of a Renewable Energy Technician. Adapted From: [UKCES](#)

In order for a household to benefit from the SEG scheme, the installation must be registered with the Microgeneration Certification Scheme (MCS)<sup>144</sup>, a scheme developed to safeguard high quality within the industry, or an equivalent scheme.

*“For PV, wind and micro-CHP installations up to 50kW, generators should demonstrate that the installation and installer are suitably certified. An applicant may have an installation certificate to demonstrate this. This may be a Microgeneration Certification Scheme (MCS) certificate, but the SEG recognises other schemes may be equivalent to MCS.” Source: [Ofgem](#)*

In order for an installer to become MCS Certified, they must make a commitment to quality workmanship and customer care, demonstrate competency and commit to continual improvement via the deployment of an effective management scheme. Full details of how each of these areas must be evidenced is available on the [MCS Website](#). Crucially, in order to demonstrate the competence of its employees, an installation company must either provide evidence of the valid qualifications held and/or short courses attended or demonstrate experience to an MCS Certification Body. The [MCS Competency Guidance](#) provides a non-exhaustive list of some of the accepted qualifications and courses that may be used to demonstrate competency (see below). It should be highlighted that these are subject to change; MCS standards have been updated since the development of these

<sup>144</sup> MCS. [A Guide to Grants and Incentives for Installers.](#)

courses, and to this end, these courses may not cover all of the MCS Scheme Criteria, and some courses may no longer be provided.

## Solar PV

- BPEC Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems
- BPEC Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems – 600/6283/6
- BPEC Solar photovoltaic (NOS mapped)
- City & Guilds Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems
- City & Guilds Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems
- EAL Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems
- EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems
- LCL Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems
- ProQual Ltd Level 3 Award in the Installation and Maintenance of Small Scale Solar Photovoltaic Systems
- ProQual Ltd Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems

*Figure 31 - A List of some of the Accepted Qualifications and Courses to Demonstrate Competency Under MCS.*

Source: [MCS](#)

Taking the BPEC courses as an example, it may be observed that training providers across the UK deliver these courses, including those situated in the WECA region<sup>145</sup>. For example, [NAPIT Training](#) delivers the BPEC Solar Photovoltaic (NOS Mapped) course in Bristol<sup>146</sup>. The main pre-requisite requirement for this course is Electrician experience, critically with BS 7671 (wiring regulations) certification, which qualifies low-voltage installations (up to 1000V AC and 1500W DC). The course also demands a Level 3 inspection and testing qualification. Such training programmes offer the potential for continued growth in Solar PV installation and related job creation in the WECA region.

Training providers surveyed as part of our research advised that Solar Technologies are a feature of some of the courses they provide. The [Level 3 Installation/Maintenance Electrician Apprenticeship](#) delivered at Weston College covers a range of topics including environmental technologies. Further to this, the '[Eco House](#)' at Weston College demonstrates practical examples of renewable technology and green technologies. The [Engineering Courses](#) at Bath College also cover Solar Technology, although the technology is not a key focus and the current learning aim is to raise awareness of the technology as opposed to fully qualifying individuals in installation.

As part of the market research conducted, a representative from a small solar company completed the industry survey. The respondent expressed the view that there is significant job creation potential, with the possibility for above 100% growth spread across all three qualification levels (Low, Intermediate and High). The respondent surveyed indicated that

<sup>145</sup> BPEC. [Find a Centre.](#)

<sup>146</sup> NAPIT. [Solar Photovoltaic Course \(PV\) - \(BP-SPV-3\)](#)

growth in Level 5 and above would be particularly high for their company, where the majority of jobs currently sit (approximately 75%, with the remainder in the low level) but that the existing skills shortages lay within the Low and Intermediate levels (NVQ Levels 1-4). The training provision highlighted above sits within the Intermediate Level (NVQ 3).

Overall, there was a view that most of the existing workforce is sufficiently skilled but that there is a need to recruit and upskill a larger workforce and that further vocational training would be an important part of this development.

## Key Recommendations

WECA's 2030 Net Zero target offers a once in a generation opportunity to grow the green economy, providing new economic opportunities for people of all ages and enabling the region to be a leader in the route to decarbonisation. WECA is not starting from scratch and can build upon the strong support for sustainability within the region and the existing skills base. The green agenda has the potential to attract investment towards the WECA region, benefitting both the environment and the economy.

Our research has revealed that pioneering work is underway within the region to develop the skills base required to enable the low carbon transition. However, further efforts are required to ensure that the opportunities provided by the transition can be fully unlocked. There is an opportunity to engage people across both the education sector and the existing workforce to enable growth of low carbon sector. For sectors facing immediate skills shortages now, there perhaps needs to be a focus on higher level education (post-19).

However, for those sectors projected to grow in the future, there is a need to focus on the green agenda more widely as part of primary and secondary level education. WECA already work with 95 schools from across Bristol, Bath & North East Somerset, South Gloucestershire and North Somerset to help improve career opportunities and work experience for young people, via the [Careers Hub](#) and will continue to provide Labour Market Intelligence (LMI) to help understand the projected demand for green skills. However, the curriculum must be adhered to, particularly at the primary and secondary school level, to ensure compliance with the educational regulatory body (Office for Standards in Education (Ofsted)). Whilst there is some flexibility, the curriculum does not necessarily stipulate that the green agenda is covered and there are therefore limitations in the extent to which these issues can be covered.

There is an opportunity to integrate these topics into extra curricula activities. The Cabot Learning Federation (CLF's) Student Parliament provides an opportunity for pupil representatives from all CLF schools within North Somerset, Bristol and South Gloucestershire to discuss key issues. Sustainability and climate change is a key theme of discussion, providing an opportunity for young people to engage in the green agenda and environmental science is one of the key provisions at Winterstoke Hundred Academy, a new school in Weston<sup>147</sup>. However, ultimately, control over school curricula is reserved to the National Government. There is therefore an opportunity for National Government to drive interest in the green agenda forward at the school level, through increased integration of

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<sup>147</sup> Weston Mercury. (2019). [Winterstoke Hundred Academy to Open to New Pupils Next September](#)

climate change and sustainability into the national curriculum. However, WECA do not have an influence over the national curriculum and this action is one that must be driven nationally. Looking at higher and further education provision, there is a willingness amongst Further Education (FE) Colleges situated in the region to develop their training provision to better encompass the 'green agenda' in advance of a projected growth in demand (the majority of training provider respondents expect demand will increase by above 50% over the next 5 years). However, crucially, the current offering is relatively limited and as such, growth is coming from a relatively low base; in the market research conducted, training provider respondents indicated that less than half of the courses they currently provide have a 'green'/retrofit element, with one noting that none of their courses have such. The majority of training provider respondents indicated that none of their courses directly target 'green'/retrofit jobs.

There is a range of emerging initiatives within the region, including those have been highlighted in each of the relevant sections above, as well as planned activities with a lower profile, such as assessor recruitment and site expansion to accommodate 'green technologies'. However, FE Colleges face challenges in developing their training provision, some of which have been highlighted in the box below. Whilst this list is not exhaustive, it provides an indication of some of the existing barriers to training development.

#### **Box 8: Challenges Faced by Training Providers**

One of the key challenges faced by some FE Colleges is the funding model. Funding is predominantly based upon immediate demand. However, the rapidly emerging nature of some sectors within the 'green' economy creates a situation whereby training providers may be required to develop their training offer, ahead of the projected growth in demand.

This is not possible for some colleges that do not have sufficient capital to cover the costs associated with course development including those associated with purchasing technologies and hiring staff. Whilst FE Colleges project that demand will rise in the future, there is uncertainty surrounding when this growth will occur, given that it is highly influenced by externalities and the funding model makes significant investment difficult.

The funding shortfall is exacerbated by other capital-intensive challenges such as Covid-19 and the shift to remote learning, as well as the fact that apprenticeship starts have reduced. According to one respondent, the majority of FE Colleges are reliant upon Government Funding; however, to receive funding, courses must be on an approved database, and there is a limited number of 'green qualifications' listed, due to their removal based upon low demand several years ago.

There is also a willingness from universities within the region to play more of a civic role. Historically, the university model has meant that universities have aspired to become world leading and research intensive; the existing model means that research efforts are often focused externally to the region itself. There is a belief that external policy influence such as Brexit and the 'Levelling Up' agenda may shift the focus of universities, in part, towards playing a greater role within the region. This poses a significant opportunity for the WECA region, with major universities situated in Bristol and Bath.

Whilst there is work underway across the education sector, WECA has an important role to play in the wider engagement and co-ordination piece. In some instances, there is an opportunity to develop new initiatives and campaigns which tie into national or global events such as COP26. However, in others, the focus should perhaps be on raising awareness of existing work programmes and ensuring that these programmes foster the development of green skills in particular. As found in the Phase 1 Project, awareness of schemes such as 'Workforce for the Future', 'Future Bright' and the 'Careers Hub' was strong amongst training providers and local government, yet few industry representatives were aware of the schemes. WECA can also play a role in bridging the gap between further education and higher education and employers, to connect these key stakeholders so that they can work on the co-design of courses to deliver the educational requirements for specific roles.

A series of recommendations have been developed based on the desk-based research conducted and our discussions with key stakeholders. These recommendations have been categorised and listed overpage.

## Recommendations

### **CREATE THE CONNECTIONS TO STIMULATE/MEET DEMAND**

1. Continue to convene industrial representatives from the region with similar skills needs (e.g. digital skills, baseline electrical skills and STEM skills), utilising existing networks and support programmes to develop a co-ordinated skills demand, pathways and signposting. Identifying cross-sector requirements may support education providers in the development modules to cover core skills, which could be common to several different courses.

This could build on work that WECA is already doing in bringing together and/or collaborating with innovative expertise to solve future challenges through programmes such as the Centre for Digital Engineering Technology & Innovation (DETI), Institute of Technology (IoT), iSTART, National Bootcamps and the Digital Skills Innovation Fund.

2. Develop and grow structured partnerships between industry, education and training providers at all levels (pre-16, Higher Education (HE), Further Education (FE) and regional Universities), to mirror the diverse requirements of the Low Carbon Sector. This could include:
  - Expansion of sector-based work academies, already funded through the Adult Education Budget, to include 'Low Carbon', conditional upon employer demand and employer willingness to offer job placements/interviews etc. being in place.
  - Further leveraging existing government and/or WECA funding/programmes such as the Kickstart, Bootcamps and Workforce for the Future, identifying opportunities to stimulate skills demand/provision and to support businesses to recruit new skills and talent into the employee market.
  - Utilise programme and funding (see examples above) to support re-training and development of new digital skills applicable to the sector demands.
  - Continue to provide sector specific information via the Careers Hub, Enterprise Advisors and Careers Leads through the pre-existing Labour Market Intelligence offering to support curriculum development on green skills and to raise awareness/interest in careers within the sector (thus stimulating future skills provision).
  - Encourage collaboration between industry and FE/HE providers to enable future training provision to be tailored to meeting industry needs and specific demands of the sector. This could be achieved through the introduction of two working groups, one focused on young people and new entrants and one focused on enabling those already within relevant sectors to upskill in low carbon technologies.
  - Stimulate market demands through continued engagement with STEM fairs
3. Create a Net Zero Taskforce, with a Skills Workstream to bring together key employers in the region with Local Government representatives to provide expert insight, grow the evidence base and assist with the development of future low carbon policy decisions. WECA could draw upon its established regional and national network across both the public and private sector including the Skills Advisory Panel, south west Local Enterprise Partnership (LEP) network and national Mayoral Combined Authority (MCA) skills network. Collaboration and a collective voice will also play an important role in the lead up to COP26 and when lobbying central government.

4. Advocate national government for continued and increased funding to support the development of the green economy, for example:
  - A 'Green Skills Fund' to ensure green skills become an integral and integrated part of training programmes.
  - Consider strategic asks to ensure access to national funding opportunities via the Comprehensive Spending Review (CSR).
  - Influence and support external parties such as Colleges and Local Authorities (LAs) to bid for '[Community Renewal Fund \(CRF\)](#)' funding linked to green skills.

## **BUILD BACK BETTER**

5. Further embed climate considerations into decision making frameworks as a mechanism to support the net zero transition. Climate considerations are a key part of WECA's Covid-19 recovery plan, with additional money committed to initiatives such as the Low Carbon Challenge Fund to drive economic recovery.
6. Continue work on capitalising positive behavioural changes formed throughout the Covid-19 pandemic, as committed in the West of England Recovery Plan. Engage new entrants to the low carbon job market through advertising campaigns by working with training providers. The above proposed taskforces and working groups should seek to use the narratives on 'building back better' and 'the green recovery' as well as key announcements such as the Prime Minister's 10 Point Plan as a stimulus for engagement and an evidence base for future demand and sector growth.

## **DEVELOP REGIONAL, INCLUSIVE INITIATIVES**

7. Develop and support regionally owned initiatives to enable WECA's constituent unitary authorities, community/parish groups and not-for-profit organisations to influence skills development and engagement. Regionally owned initiatives can help support the creation of local job and training opportunities for local people. Potential initiatives could include community renewable energy schemes and community retrofit schemes which will not only support the regions net zero aspirations but could also provide local employment and support upskilling efforts.
8. Consider launching a community low carbon investment scheme and/or support the local finance industry to encourage a shift to low carbon investment practises. As green finance investment opportunities become more prevalent, WECA could consider launching a Community Municipal Investment scheme for green projects and/or supporting the local finance industry to encourage a shift to low carbon investment practises.

## **DEVELOP INFORMATION CAMPAIGNS**

9. Develop an advertising campaign in the lead up to COP26, to champion green skills within the region, focused on purpose and career projects. There is potential for two strands to the campaign, targeted at new entrants to the job market and those seeking to transition to an alternative role.

10. Work with industry to encourage the development of education packs to be used in primary and secondary school lessons on climate change. These could be sector specific (e.g. low carbon transport) and targeted towards individual year groups.
11. Develop information campaigns targeted towards regional businesses, outlining the support packages available within the WECA region, including 'Workforce for the Future', 'Future Bright' and the 'Careers Hub', and how the programmes work in practise.

## **COLLABORATE WITH OTHER LOCAL AUTHORITIES, MCAS AND LEPS**

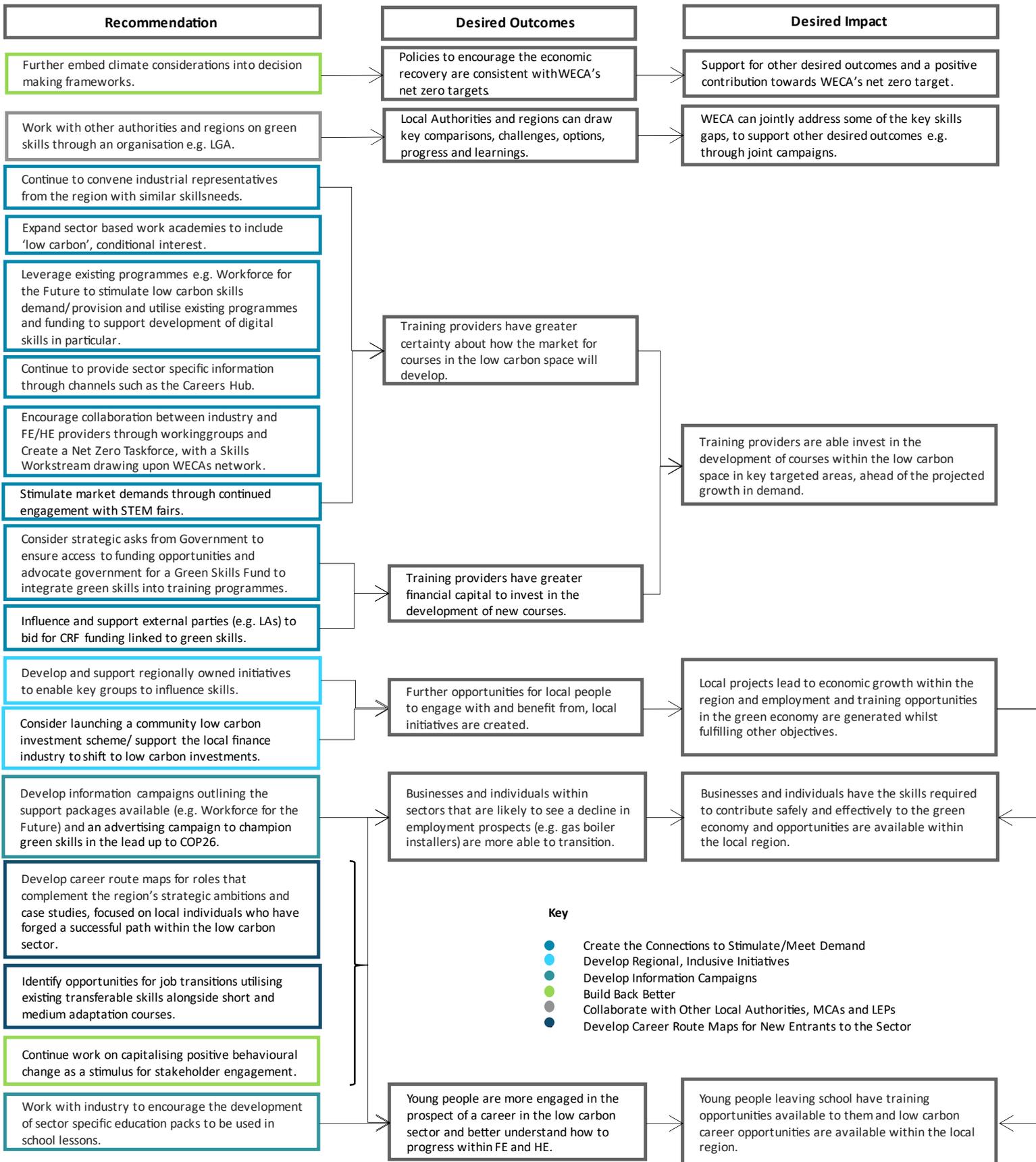
12. All authorities and regions will be seeking to address similar challenges so there is an opportunity for WECA to work with other authorities on green skills sharing resources and learnings through an organisation such as the [Local Government Association](#). This could ensure a consistent, joined up approach, whilst positioning WECA as a thought leader.

'Green' challenges, issues and opportunities do not stop at a 'boundary' and through collaboration, WECA can jointly address some of the key skills gaps. these activities could include advocacy and campaigning and collectively responding to new consultations.

## **DEVELOP CAREER ROUTE MAPS FOR NEW ENTRANTS TO THE SECTOR**

13. Develop career route maps for roles that complement the region's strategic ambitions within the green economy, focusing on strengths or skills gaps and tangible roles aligned with training providers and programmes. Route maps can enable young people to draw a connection between environmental education/vales with a long-term sustainable career within the sector.
14. Produce case studies, focused on local individuals who have forged a successful path within the low carbon sector, similar to those provided in this report. Case studies, including the highlighting of transferable soft skills, have been proven as a successful method of engagement and education for new entrants and those seeking to transition within Civil and Advanced Engineering. These case studies can also supplement Labour Market Intelligence, bringing the data to life and capitalising on the 'green movement'.
15. Where possible, opportunities for job transitions utilising existing transferable skills should be identified alongside short and medium adaptation courses. Implementing a Low Carbon search capacity within the newly launched WECA Talent Retention Platform or providing supporting information could assist with filling skills gaps and promoting the green recovery.

The graphic overpage displays the desired outcomes and impacts associated with each of the proposed recommendations.



## Appendix – Sectoral Analysis

### 1. Low Carbon Electricity

This sector includes the sub-sectors: offshore wind, onshore wind, solar PV, nuclear, hydropower and carbon, capture & storage.

Sector growth potential	Direct sector growth potential	Indirect sector growth potential
<p><b>+ 6,090 total jobs</b></p> <p><u>By type of job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 1,430</li> <li>2. Construction/installation jobs: 2,930</li> <li>3. Operation &amp; maintenance jobs: 1,730</li> </ol> <p><b>GVA: + £790m</b></p>	<p><b>+ 3,650 direct jobs in WECA</b></p> <p><u>By type of direct job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 860</li> <li>2. Construction/installation jobs: 1,750</li> <li>3. Operation &amp; maintenance jobs: 1,050</li> </ol> <p><u>By region</u></p> <ol style="list-style-type: none"> <li>1. BANE: 1,015</li> <li>2. Bristol: 1,600</li> <li>3. S. Gloucestershire: 803</li> <li>4. N. Somerset: 236</li> </ol>	<p><b>+ 2,430 indirect jobs</b></p> <p><u>By type of indirect job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 570</li> <li>2. Construction/installation jobs: 1,180</li> <li>3. Operation &amp; maintenance jobs: 680</li> </ol>

The key subsectors in low carbon electricity are solar PV and nuclear which account for roughly 3,860 and 2,000 of the net additional jobs respectively. WECA has a strong solar resource and approximately 150 MW of capacity connected to the distribution network in the region. Western Power Distribution estimate this will increase to approximately 740 MW by 2050<sup>148</sup> under their consumer transformation scenario. If WECA were to achieve net zero in 2030 this deployment should be brought forward 20 years resulting in the high employment estimate for this sector. The potential for other renewables is much lower with onshore wind estimated at approximately 100 MW under the same scenario in 2050.

WECA has strong expertise in the nuclear sector with nuclear specialisms in universities and Hinkley Point C located near the region. This EDF run site has employed over 10,000 people to date with 40% of employment provided to local people<sup>149</sup>, a proportion of these being WECA residents. The estimated employment produced by the model seems broadly in line with these figures.

Analysis of leakage rates implies WECA retains around 67% of all activity related to low-carbon electricity. For example, for every £1m in GVA created, £0.67m is attributed to the WECA region. The remaining £0.33m is exported to regions outside WECA.

<sup>148</sup> WPD. (2021). [Distribution Future Energy Scenarios](#)

<sup>149</sup> EDF. (2020). [Hinkley Point C: Realising the socio-economic benefits 2020](#)



## 2. Retrofit and Low Carbon Heat

This sub-sector includes lighting, insulation, control and monitoring, heat networks and heat pumps.

Sector growth potential	Direct sector growth potential	Indirect sector growth potential
<p><b>+ 19,660 total jobs</b></p> <p><u>By type of job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 1,920</li> <li>2. Construction/installation jobs: 15,790</li> <li>3. Operation &amp; maintenance jobs: 1,950</li> </ol> <p><b>GVA: + £1,055m</b></p>	<p><b>+ 11,530 direct jobs in WECA</b></p> <p><u>By type of direct job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 1,130</li> <li>2. Construction/installation jobs: 9,270</li> <li>3. Operation &amp; maintenance jobs: 1,130</li> </ol> <p><u>By region</u></p> <ol style="list-style-type: none"> <li>1. BANE: 1,900</li> <li>2. Bristol: 4,840</li> <li>3. S. Gloucestershire: 2,570</li> <li>4. N. Somerset: 2,220</li> </ol>	<p><b>+ 8,130 indirect jobs</b></p> <p><u>By type of indirect job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 790</li> <li>2. Construction/installation jobs: 6,520</li> <li>3. Operation &amp; maintenance jobs: 820</li> </ol>

The majority of jobs in low carbon heat and retrofit in 2030 come from heat pumps, at 11,820 additional jobs. This is partly due to the deployment profile in insulation, where it is assumed an early ramp up in deployment is optimal to support a fabric first then heat approach. More detail on this growth rate and the whole retrofit sector can be seen in the phase 1 report.

The leakage rates in these subsectors are assumed to be very low to reflect the fact that while there may be some jobs based outside of WECA, the employment in WECA will also service the surrounding area. This is particularly true if a hub of skills in retrofit and low carbon heat is developed as is the case in this modelling with almost 20,000 jobs in this sector.

### 3. Alternative Fuels

This sub-sector includes bioenergy and hydrogen production.

Sector growth potential	Direct sector growth potential	Indirect sector growth potential
<p><b>+ 650 total jobs</b></p> <p><u>By type of job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 100</li> <li>2. Construction/installation jobs: 460</li> <li>3. Operation &amp; maintenance jobs: 90</li> </ol> <p><b>GVA: + £41m</b></p>	<p><b>+ 380 direct jobs in WECA</b></p> <p><u>By type of direct job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 60</li> <li>2. Construction/installation jobs: 270</li> <li>3. Operation &amp; maintenance jobs: 50</li> </ol> <p><u>By region</u></p> <ol style="list-style-type: none"> <li>1. BANE: 30</li> <li>2. Bristol: 150</li> <li>3. S. Gloucestershire: 150</li> <li>4. N. Somerset: 50</li> </ol>	<p><b>+ 270 indirect jobs</b></p> <p><u>By type of indirect job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 40</li> <li>2. Construction/installation jobs: 190</li> <li>3. Operation &amp; maintenance jobs: 40</li> </ol>

All of the modelled jobs in this sector are in bioenergy. As the region does not have an underlying advantage in hydrogen, production is unlikely up to 2030. Beyond the 2030 timeframe there could be some level of hydrogen production, but this will be focussed on industrial clusters and offshore wind in the next 10 years. However, there is potential for hydrogen refuelling stations due to the strategic location of WECA. These are included in the low carbon transport section.

Bioenergy includes alternative fuels such as biomass and biofuels. This is likely to be a small sector in the region up to 2030 but important in decarbonising hard to treat homes as well as some commercial and industrial uses.

#### 4. Low Carbon Services

This sub-sector includes low carbon advisory, green finance and green digital jobs.

Sector growth potential	Direct sector growth potential	Indirect sector growth potential
<p><b>+ 9,410 total jobs</b></p> <p><u>By type of job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 0</li> <li>2. Construction/installation jobs: 0</li> <li>3. Operation &amp; maintenance jobs: 9,410</li> </ol> <p><b>GVA: + £737m</b></p>	<p><b>+ 5,880 direct jobs in WECA</b></p> <p><u>By type of direct job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 0</li> <li>2. Construction/installation jobs: 0</li> <li>3. Operation &amp; maintenance jobs: 5,880</li> </ol> <p><u>By region</u></p> <ol style="list-style-type: none"> <li>1. BANE: 910</li> <li>2. Bristol: 3,770</li> <li>3. S. Gloucestershire: 860</li> <li>4. N. Somerset: 340</li> </ol>	<p><b>+ 3530 indirect jobs</b></p> <p><u>By type of indirect job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 0</li> <li>2. Construction/installation jobs: 0</li> <li>3. Operation &amp; maintenance jobs: 3530</li> </ol>

Low carbon services will be an important sector for WECA in achieving decarbonisation. Low carbon advisory and digital jobs dominate the additional jobs in this sector at 4,010 and 4,550 jobs respectively. However, there is also strong growth in green finance jobs at 840 additional jobs. This builds on WECA's expertise in green finance with the UK headquarters of Triodos bank as well as Thrive Renewables.

Digital jobs in the low carbon economy could be included in each individual sector. They are shown separately here to show the scale of digital skills needed in the low carbon economy. Low carbon advisory jobs will be critical to providing support in the green economy and advising business and the public sector on decarbonisation.

Low leakage rates have been applied to the low carbon services sector to reflect the fact that the sector has a strong hub in professional services and that the majority of employment is likely to be based in the cities of WECA.

## 5. Low Carbon Transport

This sub-sector includes EV vehicle and battery manufacture, EV charge ports, hydrogen refuelling stations, hydrogen fuel cell manufacture and low carbon aerospace.

Sector growth potential	Direct sector growth potential	Indirect sector growth potential
<p><b>+ 1,780 total jobs</b></p> <p><u>By type of job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 970</li> <li>2. Construction/installation jobs: 550</li> <li>3. Operation &amp; maintenance jobs: 260</li> </ol> <p><b>GVA: + £155m</b></p>	<p><b>+ 940 direct jobs in WECA</b></p> <p><u>By type of direct job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 510</li> <li>2. Construction/installation jobs: 290</li> <li>3. Operation &amp; maintenance jobs: 140</li> </ol> <p><u>By region</u></p> <ol style="list-style-type: none"> <li>1. BANE: 70</li> <li>2. Bristol: 170</li> <li>3. S. Gloucestershire: 620</li> <li>4. N. Somerset: 80</li> </ol>	<p><b>+ 840 indirect jobs</b></p> <p><u>By type of indirect job:</u></p> <ol style="list-style-type: none"> <li>1. Manufacturing jobs: 460</li> <li>2. Construction/installation jobs: 260</li> <li>3. Operation &amp; maintenance jobs: 120</li> </ol>

The majority of jobs in this sector come from the low carbon aerospace sector at 990 additional jobs. This is an ambitious target, yet it will not result in zero emission air travel. However, this would allow WECA to reduce emissions associated with aerospace through efficiency improvements and sustainable aviation fuels. Developing the skills in hydrogen and electric aerospace would give WECA a competitive advantage when these energy sources become a viable option.

A further 660 of the additional jobs are in the EV charge port subsector. This job growth is driven by the assumption that a large proportion of WECA switch to driving electric vehicles and the use of electric buses increases substantially by 2030. There are no jobs modelled in EV manufacture as production of electric vehicles is likely to take place in regions with a strong automotive sector, outside of WECA.

Employment in hydrogen refuelling stations has been modelled at 60 in 2030. This is based on the assumption that WECA becomes a hub for refuelling stations based on its strategic location connecting the South West and Wales to the rest of the country.

## Sample Structure and Methodology

A combination of scenario modelling, market research and desk-based research was used to inform the development of this report.

### Scenario Modelling

Top-down modelling was conducted to estimate the number of net additional jobs required for the West of England – made up of Bath & North East Somerset, Bristol, North Somerset, and South Gloucestershire – to meet net zero by 2030. This analysis was also carried out for a baseline scenario as well as two further scenarios to estimate the impact of the pandemic on the baseline and net zero scenarios.

### Defining the low-carbon economy

Ecuity utilised its in-house model which estimates the number of low-carbon and renewable energy jobs (LCREE) in 2030 and 2050 across all local authority districts in England, Scotland, and Wales. The scope of this model was aligned with the ONS's current definition of the LCREE. This definition covers six high-level groups: low-carbon electricity, low-carbon heat, energy efficiency, energy from waste & biomass, low-carbon services, and low-carbon transport & infrastructure. Ecuity enhanced this by adding Aerospace, Digital, Environmental Consulting, Afforestation and Green Finance. This was done to ensure the definition of low-carbon goods and services covered key growth sectors in the West of England.

Low-carbon economy: ONS definition		Low-carbon economy: WECA definition	
Sectors	Sub-sectors	Sectors	Sub-sectors
Low-carbon electricity	Offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, nuclear, carbon capture & storage	Low-carbon electricity	Offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, nuclear, carbon capture & storage
Low-carbon heat	Renewable heat, renewable CHP	Low-carbon heat	Renewable heat, <b>heat networks</b>
Energy from waste & biomass	Bioenergy and alternative fuels	Alternative fuels	Bioenergy and <b>hydrogen</b>
Energy efficient products	Energy-efficient products, energy-efficiency lighting, energy monitoring, saving or control systems	Energy efficient products	Energy-efficient products, energy-efficiency lighting, energy monitoring, saving or control systems
Low-carbon services	Low-carbon financial and advisory services	Low-carbon services	Advisory, <b>green finance</b> and <b>digital</b>
Low-carbon transport & infrastructure	Low-emission vehicles and infrastructure, fuel	Low-carbon transport & infrastructure	Low-emission vehicles and infrastructure, fuel

	cells and energy storage systems		cells, energy storage systems and <b>aerospace</b>
		<b>Environmental sector</b>	<b>Environmental consulting and afforestation</b>

Key: **Green highlight** shows a new sub-sector has been added. **Yellow highlight** shows a sub-sector renaming.

Developing the central scenario: Net Zero 2030

Using Ecuity’s in-house model, a deployment profile was created for each low-carbon technology in scope (e.g. heat pump deployment, insulation roll-out, EV uptake). This deployment profile was in line with the modelling undertaken as part of the analysis for the Local Government Association (LGA). While analysis for the LGA saw net zero achieved by 2050, for this analysis we brought forward this deployment rate to 2030; such that net zero is met by 2030.

Employment intensities (i.e. jobs per GWh installed) were then applied to the level of deployment in each year to create an employment profile between 2020 and 2030. The employment estimates were ‘gross’ estimates and therefore did not account for any transitional or displacement effects.

We used the ONS’s NOMIS resource to estimate current levels of employment in Aerospace, Digital, and Finance in BANES, Bristol, North Somerset and South Gloucestershire. We then calculated a historic compound average growth rate (CAGR) and used this to project forwards to 2030. This estimate of jobs includes both traditional and low-carbon jobs. To isolate the number of low-carbon jobs, we assumed a nominal exponential uptake of low-carbon jobs rising from 1% of all additional jobs (from 2020 onwards) to 100% of all additional jobs by 2030.

As all Environmental Consulting and Afforestation employment can be considered “green jobs” a different method was developed for these sectors. Environmental consulting was assumed to grow using the 4-year NOMIS CAGR (2015-2019) for the baseline (1%), and a 3 year CAGR (2015-2018) for the net zero scenario (13%), removing the anomaly in employment during 2019. This method produces net zero employment estimates broadly in line with the other low carbon service sectors for the region and was used due to a lack of data on employment required for net zero.

The afforestation job estimate was developed by bringing the CCC’s estimate of woodland growth required for net zero 2050 forward to 2030. This 37% growth<sup>150</sup> was then applied to WECA’s woodland to produce an estimated growth in woodland needed for net zero. A Friends of the Earth study into the potential for woodland growth by local authority estimated 93% growth<sup>151</sup> was the technical feasible limit to what is possible in WECA, and provided a sense check to ensure the CCC’s growth requirement was feasible for the region. Labour intensities were then applied to the woodland growth needed for net zero to produce the estimated employment in the net zero scenario. These were estimated by assuming 20% of workers employed in the Silviculture and Other Forestry Activities SIC code were employed in tree planting, based on a conversation with an employee at a company in the forestry

<sup>150</sup> CCC. (2020). [The Sixth Carbon Budget](#)

<sup>151</sup> Friends of the Earth. (2020). [Local opportunities to boost woodland](#)

sector located in WECA who stated most employment would be in management of existing woodland. The baseline scenario for this sector was guided by the same individual, who suggested that 5 additional jobs in planting and management would be ambitious but realistic.

#### i. Gross to Net jobs

We considered two factors in estimating the net impact: displacement and leakage. Displacement estimates the effects that replace existing activities. Leakage represents the economic benefits that fall outside the target area (i.e. WECA). Some work is likely to be carried out by delivery partners outside the region in pockets of complementary expertise. Displacement and leakage rates were estimated for each low-carbon sub-sector. We used the formula below to enable estimation of the number of net jobs.

$$\text{Net jobs} = \text{Gross jobs} \times (1 - \text{Displacement rate}) \times (1 - \text{Leakage rate})$$

Because the conventional definition of low-carbon economy does not include sectors which are of strategic importance to WECA, we estimated the employment impact of these separately.

#### ii. Estimating total jobs

Estimates of jobs (whether gross or net) captured 'direct' activity only. To estimate total activity or total jobs, it was necessary to estimate the 'indirect' activity. This indirect activity is the effect of engaging and mobilising the wider industry supply chain following increased demand from direct activity. We utilised the ONS's Input-Output tables which provide Type 1 employment multipliers by industry. We assigned standard industrial classification (SIC) codes to each low-carbon sector. While the mapping process is not 100% accurate, it is still a robust method to map and bridge conventional and low-carbon sectors. This mapping process enabled us to assign a multiplier value to each low-carbon sub-sector. To estimate the indirect activity, we used the formula below and the sum of indirect and direct jobs then gave total number of jobs.

$$\text{Indirect jobs} = \text{Direct jobs} \times (\text{Type 1 multiplier} - 1)$$

#### iii. Estimating jobs by type

It is important to understand what types of jobs will be created. Jobs can range from manufacturing, construction & installation & longer-term operation & maintenance. For the wind sector, manufacturing and operation & maintenance account for around ~90% of the job breakdown, with the remaining 10% related to installation (of turbines, electrical connection). We used a range of sources to estimate the breakdown of jobs by type for each low-carbon sector. The results were in line with the wider employment by type trend across the West of England where construction/installation and operation & maintenance jobs account for the majority of jobs by type.

#### iv. Estimating GVA

Gross Value Added (GVA) measures the economic contribution to the local economy. In this case, GVA would capture the benefit from increased employment in the low-carbon economy across the West of England. We utilised the ONS's Annual Business Survey which provided estimates of GVA and employment by SIC. We calculated a GVA to employment

ratio for each SIC code which was relevant to the low-carbon economy. This ratio (GVA/employee) was then multiplied by jobs (calculated earlier) to provide an estimate of GVA across the West of England.

Since this estimate of GVA was direct only, we used the Input-Output tables to source GVA Type 1 multipliers. Applying these multipliers to direct GVA enabled estimation of indirect GVA, and therefore allowed calculation of total GVA.

### Market Research

Market research was carried out in January 2021 and three key stakeholder groups were targeted.

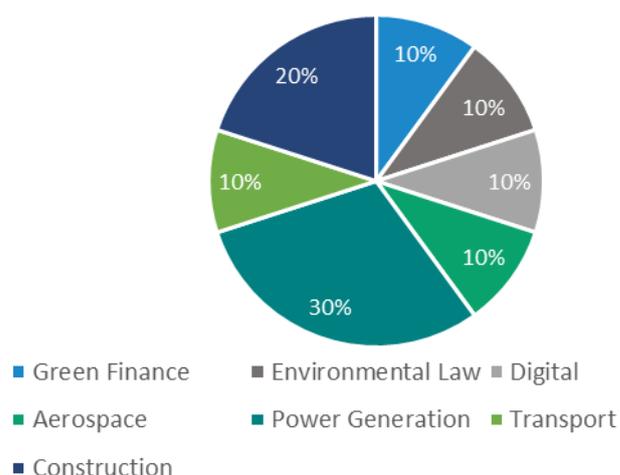
1. Industry Representatives, since industry will be key to the green transition.
2. Skills and Training Providers, since training providers will play a pivotal role in ensuring that existing and emerging skills gaps can be addressed.
3. Local Government Representatives, who were able to offer key insight into some of the challenges and opportunities currently facing the transition within the region, from a skills and wider development perspective.

Three sets of questions were developed for the groups (industry, skills and training providers, and government representatives), and participants were invited to either partake in a semi-structured interview or to complete an online survey.

### Industry

A total of 10 key industry players, ranging from Small Medium Enterprises (SMEs) to Major Corporations were interviewed across several areas of the 'green' sector. It is important to highlight that respondents in the retrofit sector were also interviewed but these findings have been captured within Phase 1 of this Project which focuses on Retrofit.

Company Core Business/Expertise

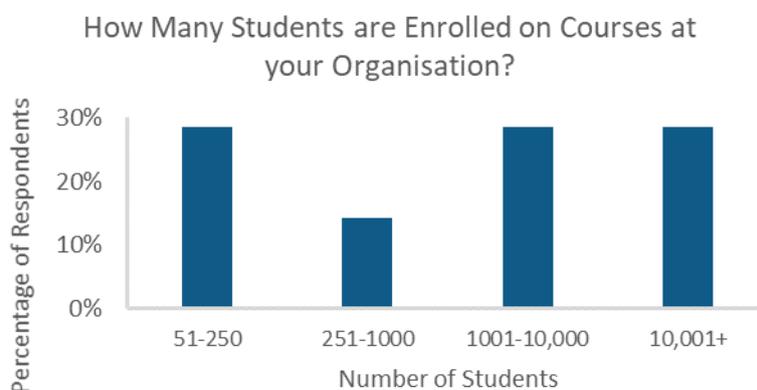


Consultation focused on a range of issues, including the existing and projected future skills demand, the wider challenges currently faced by the sector and the interventions needed to support future growth.

Insights were also gained from a Social Enterprise that provides support services to businesses in the region as well as a Charity working as part of the West of England Works Project. Additional feedback was also provided by a leading company within the Nuclear Sector as well as a leading manufacturer of high-performance building envelope solutions. Attendees of a recent Construction Excellence South West (CESW) Innovation & Sustainability Theme Group Meeting were also consulted on some of the key areas within this research and provided their valuable insight.

### Skills and Training Providers

A total of 8 Skills and Training Providers from both within and outside of the WECA region were interviewed to provide a better understanding of the existing courses available within the retrofit and wider 'green' space, how providers expect demand for courses to change, and how they are planning to adjust. The training providers surveyed varied in size. Findings from these respondents have been captured in the Phase 1 Report focused on Retrofit and in this report, dependent on where the findings were deemed to be the most relevant.



### Government Representatives

A total of four Local Government representatives were interviewed across three Local Authorities (LAs). The LAs represented were Bristol City Council, Bath and North East Somerset Council (BANES) and North Somerset Council.

It is worth noting that Bristol and BANES are both within WECA whilst North Somerset Council is part of the West of England Local Enterprise Partnership (LEP) Board, which is supported by WECA and closely linked to the authority.

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