INFORMED STRATEGIC DECISIONS

Green Skills Adult Education Provision in London

GLA Research Project

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The views expressed in the report are those of the authors. They do not necessarily reflect those of the Greater London Authority.

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EXECUTIVE SUMMARY

ABOUT THE STUDY

These are the summary findings of a research report on the provision of 'Green Skills' funded through the Adult Education Budget in London. The study was commissioned by the Greater London Authority (GLA). It was undertaken by RCU Ltd. The research was carried out between April 2021 and August 2021. Some of the data collection was delayed by the lockdown due to Covid-19.

OUR REMIT

The research focused primarily on the extent to which the demand for green skills is currently met by courses funded through the Adult Education Budget (AEB) and the potential for using the AEB for developing green skills in the future. The specific objectives of the research study were to:

- Identify existing AEB-funded courses developing skills required for, and complementary to, green occupations.
- Establish the profile of learners enrolled on courses associated with green occupations.
- Locate green skills courses in the full training pathway for green occupations including progression to green skills courses not currently fundable under the AEB, including FE loan-funded courses and apprenticeships.
- Identify the training providers (including AEB-funded providers and those not funded under the AEB) currently delivering green skills courses.
- Identify the barriers for potential learners to take up green skills courses.
- Identify the barriers for training providers to deliver green skills courses.
- Identify the barriers for employers in hiring green skilled workers and upskilling current employees in green tasks/occupations.

OUR APPROACH

The research used a mixed-method approach involving both fieldwork and data analysis. The fieldwork involved online video interviews with 38 training providers, London Boroughs, employers, employer and sector bodies and awarding organisations[1]. The primary source of learner data for the quantitative analysis was the Individualised Learner Record (ILR). This provided information on learners, apprentices, courses and providers (including FE colleges and private training providers) funded through further education and skills funding streams. The data analysis focused on learners who have a normal permanent residency within Greater London.

Although there has been extensive research on green sectors of the economy and green jobs over the past few years, there has been comparatively little analysis of how the current adult education provision in the UK can support the demand for green skills. Previous research studies have noted that there is no universal definition of a green job and the green economy and therefore identifying relevant 'green skills' courses was not straightforward.

[1] Organisations participating in the research are listed in Annex B.

Our research used a methodology based on previous research carried out by GLA Economics that identified a list of SOC2010 occupations affected by greening based on O*NET, an occupational classification database developed in the United States. This categorisation is particularly useful for the current research project as it provided a mechanism for mapping green occupations at SOC2010 to existing qualifications (both AEB funded and others). GLA Economics identified a total of 63 green occupations at SOC major groups 3-9. These occupations generally have an entry requirement at Level 3 and below, which corresponds to the qualification levels funded through the Adult Education Budget.

The report includes analysis of qualifications supporting the following industrial sectors that are key to transitioning to net zero: Building & Construction; Transport & Logistics; Environment, Conservation & Agriculture; and Energy & the Circular Economy. The report also includes a section focusing on specialist enabling STEM skills required across a wide range of sectors and a section reviewing the need for generic green skills courses that provide all individuals and businesses with the skills needed to reduce carbon emissions.

MAIN FINDINGS

The AEB supports the green skills agenda in a range of different ways. Only a small number of AEB-funded learners are taking courses that are providing very specific green skills, such as installing heat pumps or electric vehicle (EV) charging points or supporting the development and maintenance of renewable energy sources. For example, in 2019/20 there were just 60 learners taking the Diploma in Refrigeration, Air Conditioning and Heat Pump Systems.

However, the AEB provides support for the green economy in other ways. Firstly, the research highlighted the need for an increasing number of general construction workers and electricians who have a wide range of relevant skills. The AEB is currently supporting initial training in these areas.

Many AEB learners are also taking STEM qualifications such as digital technology, science and engineering. These 'enabling' skills are required in different sectors including construction, transport, environment and energy that have a key role to play in the green economy. Digital technology is seen by employers as a particularly vital tool for reducing carbon emissions.

The AEB also helps to develop skills in generic areas such as finance, project management, marketing, retail and customer service. Whilst these are not uniquely 'green skills', expertise in these areas will be required if a net zero economy is to be realised. Employers in the automotive industry, for example, felt that developing customer service skills at dealerships will be needed in order to encourage the purchase of electric vehicles. Construction employers stressed the importance of project management in the retrofitting of buildings.

The research reviewed course and module content for some of the most popular qualifications in key green sectors. Green and sustainability issues were sometimes mentioned but this was often a small element of the course and the level of detail that would be covered was unclear. In many cases qualifications were felt by employers and providers to be rather traditional and were not reflecting the latest green requirements.

The characteristics of learners varied by sector but in general 'green skills' courses attracted a higher proportion of male learners than other AEB-funded courses (51% compared to 30%), but a similar proportion to the population of all 19+ London residents. Courses relevant to green skills also attracted a

higher proportion of ethnic minorities and learners from deprived postcodes compared to other AEB-funded courses and the population of 19+ London residents. The proportion of learners on courses relevant to green skills who were classified as White was 40% compared to 60% for all 19+ London residents. Approximately 25% of learners taking courses relevant to green skills lived in the most deprived quintile in England, compared to just 16% for all 19+ London residents.

Learners were predominately studying at Level 2 and below and many learners will have had few prior qualifications before taking the course. AEB-funded green skills courses include both short courses for employed adults and initial training qualifications for young adults starting out on their career.

Apprenticeships appear to provide the most popular progression pathways in Building and Construction and in Transport and Logistics. Apprenticeship Standards are very occupationally specific, and a number are closely related directly to green jobs e.g. Refrigeration, Air Conditioning & Heat Pump Engineering Technician and Water Environment Worker. In Science and IT (Practitioner) the most popular progression route is into higher education, often via an FE Loan-funded course such as a HE Access Programme.

However, progression pathways do not appear to be clearly defined in all areas. This is partly due to historical AEB funding rules which prioritised the funding of courses below Level 3. Recent GLA AEB rule changes and the new DfE Level 3 entitlement provides an opportunity to develop more explicit progression pathways from the AEB to higher education and into employment. Level 4 and 5 higher technical education in green skill areas is also under-developed and there appears to be a need to review the vocational green skills offer across all funding streams to ensure that there are appropriate progression pathways.

Employers in all sectors felt that it was important to focus the AEB on developing long term career pathways for individuals with a broad range of skills rather than short term jobs for particular 'green' tasks. This would help to provide routes to good sustainable employment for the most disadvantaged individuals in London.

Green skills technical updating courses for already qualified adults are often, it appears, delivered commercially at full cost rather than through the AEB. For example, City and Guilds offers a range of short courses for trained electricians in installing EV chargers. However, it is difficult to establish the scale and scope of commercial provision as it does not appear on any public dataset.

Discussions with providers, employers and awarding organisations highlighted several barriers to developing green skills. These included:

- The accreditation of new AEB fundable qualifications is often a lengthy and time-consuming process and not felt to be responsive to the needs of employers and providers. There were several examples of colleges developing bespoke full cost provision for employers as existing publicly funded qualifications were not appropriate. Awarding organisations are keen to work with the GLA, employers and providers to develop new qualifications and have enormous experience in this area.

- The uptake of skills is hampered by a lack of demand for important green products and services such as heat pumps, electric cars and hydrogen technology. Employers and providers are waiting for Government action to incentivise the market before investing heavily in this area.

- Green skills were felt to be poorly defined and poorly understood by many employers and individuals. Whilst most people were supportive of the need to move towards a net zero economy it was not clear what practical actions needed to be taken and by whom. It was felt that simple, clear communication was required. Many businesses were focusing on immediate issues and did not see the need to invest in green skills at this time. This was particularly the case with small businesses.

- Many teaching staff have not kept up to date with the latest developments and would find it difficult to integrate green issues into their teaching. Staff development was seen to be a priority.

RECOMMENDATIONS

Recommendation 1: The GLA to facilitate partnerships between employers, providers and awarding organisations to support the delivery of green skills, including through the Mayor's Academies Programme

The research project found that employers, providers and awarding organisations were positive about the need to develop green skills. However, development of green skills within courses funded by the Adult Education Budget was often patchy and it was unclear how future developments in this area would be coordinated.

The GLA should seek to encourage partnerships between employers, providers and awarding organisations that have a focus on delivering green skills for London residents, including through the Mayor's Academies Programme. Suggested priorities for the partnerships are listed in the recommendations below.

The Mayor's Construction Academy has already helped to develop partnerships in the Building and Construction sector. The launch of new Academies in Green Skills and Digital should provide partnership development opportunities in other green sectors with the potential to include awarding organisations and other stakeholders.

Recommendation 2: Employers to work with providers and other stakeholders to better define and develop suitable career and training pathways to progress into good quality 'green' jobs

Most of the AEB provision is at Level 2 and below whilst employers are reporting skill shortages at higher levels. The GLA has already introduced a number of flexibilities which can support a wider range of Londoners to access the AEB. Greater flexibility of funding rules provides an opportunity for partners to map out and develop career pathways allowing progression from Entry Level to higher education and into employment.

Developing green validated career pathways would involve reviewing and developing holistically both AEB-funded courses and higher technical qualifications, together with their associated curriculum content, to ensure that green skills within specific sectors are properly developed.

Employers in green sectors told us that new individuals entering the workforce will require a broad range of skills. Whilst there is a short term need for tasks such as installing EV charging points and heat pumps, these tasks need to be embedded within broader training pathways that provide long-term careers.

Recommendation 3: Awarding Organisations should develop flexible micro qualifications in 'green skills' for trained adults

Employers told us that meeting adult skills needs would benefit from a greater range of modular micro-qualifications that are delivered flexibly for existing employees. Although largely outside of the scope of the AEB, these micro-qualifications could be at all levels from Level 2 to Level 6 but should be part of a coherent package of continuing professional development. GLA facilitated partnerships could help to develop this type of flexible provision.

Recommendation 4: Providers should continue to support digital and STEM skills as part of meeting net zero goals

Employers across all sectors told us that digital and STEM skills were vital in moving towards a net zero economy. The skills required are at all levels with a particular requirement for programmers, data analysts and engineers. The AEB can provide both initial training (with progression pathways to higher education) and professional updating.

Recommendation 5: The sector should develop a coordinated green skills teacher training programme

Providers and employers felt that teacher training would be essential if the AEB was to be effective in developing green skills. Teacher training would need to be contextualised to specific industrial sectors and different learner groups. This could cover specific green skills requirements in areas such as construction and the environment as well as general green awareness training in other areas.

Recommendation 6: Providers and awarding bodies should embed green awareness across the adult curriculum

The research highlighted the need for general green awareness for all individuals. Whilst most people were supportive of moving towards a net zero economy, many were confused about what they could do personally to make a difference.

In 2019/20 over 200,000 people enrolled on AEB-funded courses, some or many of whom could have benefitted from accessing a short green awareness course or taster session. Such courses for individuals could help to raise awareness and improve understanding in measures that could help with creating a more sustainable environment. This could include a focus on areas such as waste reduction, recycling, adapting to climate change, carbon footprint calculations, renewable energy sources, EV benefits etc. The GLA could support this development by communicating the value of green awareness courses to London residents.

Teaching staff should also be encouraged to develop examples related to sustainability and low carbon within their teaching, across all subject areas. This could include basic skills and ESOL provision which is the largest AEB-funded subject area. This would help to raise green awareness and encourage progression into green vocational areas.

Recommendation 7: The GLA should continue to actively promote the Importance of green skills to help support the ambition of growing London's green economy

The GLA should help to promote green skills through its communications and marketing channels. In particular, it should develop a series of case studies of learners who are employed in green areas of the economy and use these to encourage other adults to take up courses, helping them to progress into jobs in these sectors. The GLA should also help to promote participation in green skills courses through careers advice and guidance services.

Employers and providers felt that London's government had an important role to play in promoting green skills qualifications by stimulating demand for green job creation and supporting skills supply, including through its network of suppliers and subcontractors. This could involve, for example, the development of procurement standards that helped increase the demand for green skills qualifications.

PART ONE: INTRODUCTION AND METHODOLOGY

This is the report of a research study on green skills provision in London. The research focused primarily on the extent to which the demand for green skills is currently met by courses funded through the Adult Education Budget (AEB) and the potential for using the AEB for developing green skills in the future. Since 2019 the AEB has been devolved to the Greater London Authority and other combined Authorities in England. The research also reviewed the current 'green skills' apprenticeship and higher technical education offer and investigated how these courses could provide possible progression routes or pathways from AEB funded courses.

1.1 REQUIREMENTS OF THE RESEARCH

The research was commissioned by the Greater London Authority (GLA) following an invitation to tender. The GLA sought to understand, using both quantitative and qualitative evidence, the landscape of green skills provision available to London residents and how this provision could be improved in the future.

The specific objectives of the research study were to:

- Identify existing AEB funded courses developing green skills required for, and complementary to, green occupations.
- Establish the profile of learners enrolled.
- Locate green skills courses in the full training pathway for green occupations including progression to green skills courses not currently fundable under the AEB, including FE loan funded courses and apprenticeships.
- Identify the training providers (including AEB-funded providers and those not funded under the AEB) currently delivering green skills courses.
- Identify the barriers for potential learners to take up green skills courses.
- Identify the barriers for training providers to deliver green skills courses.
- Identify the barriers for employers in hiring green skilled workers and upskilling current employees in green tasks/occupations.

1.2 CONTEXT OF THE RESEARCH

In his environment strategy, the Mayor of London committed to making London greener, cleaner and ready for the future. In February 2020, the Mayor committed to delivering a 'Green New Deal', pledging to make London carbon neutral by 2030. The Green New Deal website states that:

"London is a world leader for climate action. Its growing 'low carbon and environmental goods and services' sector is worth £40bn in sales and employs nearly 250,000 people. Examples include renewable energy projects like wind and solar and other green technology and materials to make low carbon buildings and transport. Putting the environment at the centre of our recovery will bring new investment to London, help businesses to see long-term growth, and provide decent, skilled, local jobs".

Examples of new 'green skills' required to meet the net zero emissions targets include the installation of electric vehicle charging points, retrofitting of buildings for energy efficiency and to adapt them to the changing climate and extreme weather, low-carbon heating technology, solar PV installation, construction of

active travel infrastructure. Green spaces also play a key role in enhancing London's resilience to climate change. The transition to net zero will also require a range of generic and enabling skills across a wide range of industries which are likely to change many existing jobs as well as creating new ones. For example, companies and individuals will need to address issues such as minimising waste, improving recycling, developing new and innovative green products and services, understanding carbon financing and responding to changes in consumer demand.

The London Recovery Board, co-chaired by the Mayor of London, has chosen the Green New Deal as one of its recovery missions in the wake of COVID-19, with a priority 'to tackle the climate and ecological emergencies and improve air quality by doubling the size of London's green economy by 2030 to accelerate job creation for all'[2]. It is important that opportunities arising from the move towards net zero are available to all Londoners. This requires creating good quality jobs and targeting those most in need. The report *London, A Just Transition City (IPPR, February 2021)*, defines a 'just transition' city as:

"A city which is taking rapid and serious steps towards achieving carbon neutrality and restoring nature, delivered through policies which maximise the opportunities of the transition, promote greater fairness and equality, and which put the needs of the poorest and most excluded first."

1.3 THE ADULT EDUCATION BUDGET

The Adult Education Budget (AEB) is one of the GLA's main delivery levers for skills, funding education and training for adults aged 19 and above. The £300 million fund was delegated from the Department for Education to the GLA in 2019 and provides a range of skills training. Funded providers include further education colleges, local authorities, independent training providers, institutes for adult learning, sixth form colleges and universities. This research project focused primarily on courses from Levels 1 to 3 funded by the AEB and identified both existing green skills provision and areas where it could be developed further[3].

In the 2019/20 academic year there were 213,480 learners funded through the AEB (of which 78,830 were taking community learning courses). Most of these learners were studying at Level 2 (equivalent to GCSEs) and below (Figure 1) as historically national funding policy fully funds basic literacy and numeracy courses and learners who do not already have a full Level 2 qualification. In many industrial sectors this does not provide the skill level required for direct entry to employment, so AEB learners may need to progress to an apprenticeship or a higher-level course first. The research study also includes details of courses that might act as progression pathways from AEB provision, such as apprenticeships, higher technical education and courses funded through FE loans.

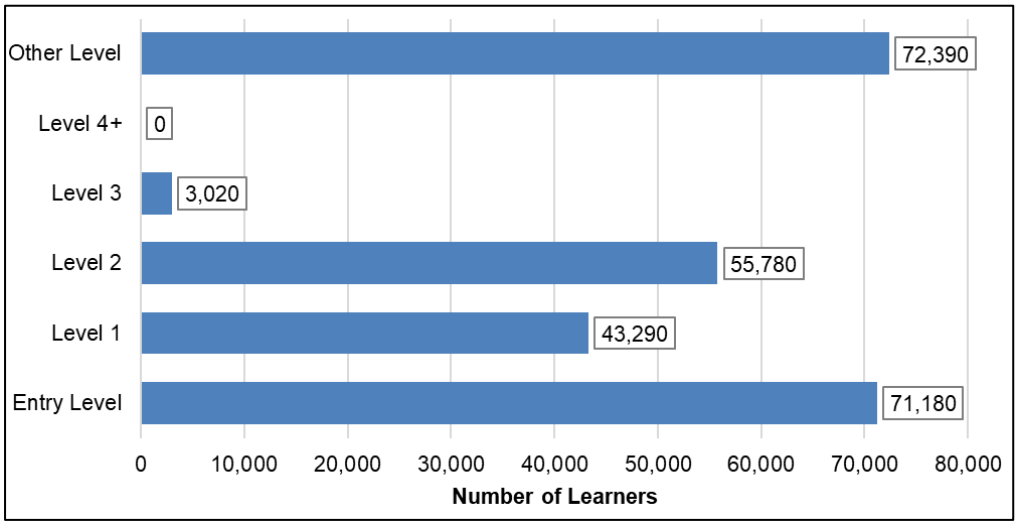
The GLA introduced a new Level 3 flexibility to the AEB in the academic year 2020/21 in support of London's recovery from the COVID-19 pandemic. It enables any eligible unemployed or low-paid Londoner to access Level 3 learning and retrain, even if they have existing qualifications. Qualifications eligible for the Level 3 flexibility include vocational courses such as certificates or vocational diplomas of no longer than 12 months in duration and that are designed to provide progression to work. Qualifications such as Access to HE

[2] *A Green New Deal* https://www.london.gov.uk/coronavirus/londons-recovery-coronavirus-crisis/recovery-context/green-new-deal

[3] The research study also includes details of courses that might act as progression pathways from AEB provision, such as apprenticeships, higher technical education and courses funded through FE loans.

Diplomas, A Levels and two-year Diplomas or Extended Diplomas are not in scope for the Level 3 flexibility, but can be funded through FE Loans.

Figure 1: Adult Education Budget – Learner Numbers



Source: GLA AEB 2019-20 August-July R14 Data Tables London

At the Spending Review in November 2020, the Government announced £95 million of funding to give adults free access to a range of Level 3 qualifications. Hundreds of courses have been identified to support adults to gain skills leading to jobs in sectors such as construction, healthcare and digital. This new national Level 3 offer came into force in April 2021, further extending the range of qualifications available through the AEB.

1.4 THE MAYOR'S ACADEMIES PROGRAMME

The Mayor's Academies Programme aims to support Londoners hardest hit by the pandemic into good work in sectors key to London's recovery and long-term economic growth, as part of the London Recovery Programme. Priority sectors have been identified as green, digital, health and social care, creative industries and hospitality. The GLA has made available up to £3 million for the setting up and delivery of partnerships bringing together organisations such as training providers, employers and other local partners to improve coordination of provision and employment reflecting the priority sectors.

The programme builds upon the success of the Mayor's Construction Academy (MCA) which sought to address skills gaps facing the construction sector, creating more opportunities for Londoners to benefit from 'good' work opportunities. The programme also builds on the work of the Mayor's Workforce Integration Network (WIN), which was established to address the structural barriers that prevent underrepresented groups from accessing high quality work opportunities across the different sectors in London.

1.5 GREEN SKILLS DEFINITIONS RELEVANT TO AEB ANALYSIS

Although there has been extensive research on green sectors of the economy and green jobs over the past few years, there has been comparatively little analysis of how the current adult education provision in the UK can support the demand for green skills.

The Green Jobs Taskforce, convened by the UK Government to look at the skills needed to drive a green recovery, published a report in July 2021[4] which noted that there is no universal definition of a green job and the green economy. This, the report stated, makes it extremely complex and challenging to identify and agree courses that support the need for 'green skills'.

The United Nations System of Environmental Accounting defines the Environmental Goods and Services Sector (EGSS) as "areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources". In the UK, the ONS uses the EGSS definition as one way to estimate the green economy. The International Labour Organization (ILO) defines green employment more broadly and considers 'green jobs' as also those involving activities such as community adaptation to climate change. The ILO broadens the definition of a green job, including the attributes of 'decent work' for a job to be considered green.

The definition of 'green' taken by the GLA covers all sectors and sub-sectors within the low carbon environmental goods and services sector (LCEGS) taxonomy. The GLA's current green skills work uses the LCGES definition adding two other sectors; designing, building and maintaining active travel infrastructure and enhancing green spaces and resilience.

The Green Jobs Taskforce itself defines a 'green job' as employment in an activity that directly contributes to - or indirectly supports - the achievement of the UK's net zero emissions target and other environmental goals, such as nature restoration and mitigation against climate risks. It identified the following broad categories of activity: Homes & Buildings, Transport, Natural Resources, Power, Business & Industry, and Enabling Decarbonisation.

There has also been research on green jobs and the green economy using O*NET, an occupational classification database developed in the United States. GLA Economics has identified a list of SOC2010 green occupations based on the O*NET classification and building on work by Sofroniou & Anderson (2020)[5]. This categorisation is particularly useful for the current research project as it provides a mechanism for mapping from occupations affected by greening at SOC2010 to existing qualifications (both AEB funded and others). The O*NET approach uses a broad definition of green skills, and breaks green job roles down into three sub-categories:

- Green Increased Demand – existing jobs that are expected to be in high demand due to greening, but do not require significant changes in tasks, skills or knowledge.
- Green Enhanced Skills – existing jobs that require significant changes in tasks, skills and knowledge as a result of greening.

[4] Green Jobs Taskforce (2021) *Report to Government, Industry and the Skills Sector*

[5] Sofroniou & Anderson (2021) *The green factor: Unpacking green job growth*

- Green New & Emerging – unique or emerging jobs created to meet the new needs of the green economy.

This classification has particular relevance for the Adult Education Budget as it helps us to identify the types of courses that might be required to support green jobs e.g. technical updating and CPD modules might be more appropriate for 'Green Enhanced Skills', whilst new full length training programmes might be required for 'Green New and Emerging' jobs.

As previously noted, the Adult Education Budget funds courses at Level 3 and below, with the majority of courses being at Entry Level, Level 1 and Level 2. Many of the skills required by a green economy are likely to be at a higher level than this, so a broad definition of green skills, such as that developed by GLA Economics, (taking into account changes in demand for certain roles as well as the need for professional updating) seems to be most appropriate for this research study.

1.6 METHODOLOGY

The research used a mixed-method approach involving both data analysis and interviews with providers, London Boroughs, employers, employer bodies and awarding organisations.

Fieldwork Interviews

The fieldwork involved online video interviews with 38 providers, London Boroughs, employers, employer bodies and awarding organisations, focusing on the following key issues:

- Their understanding of the nature of 'green skills'
- The current and future demand for green skills
- The factors behind course take up and delivery
- Potential barriers for the take up of green skills by learners and providers
- Potential barriers for employers hiring individuals with green skills
- Potential barriers for employers upskilling the existing workforce in green skills

The interview sample and questions were agreed with the GLA at the start of the research project and all participants were sent a discussion guide prior to each interview. Interviews were on average approximately 30 minutes in length. A full list of interview respondents is given in Annex B.

Identifying AEB Funded 'Green Skills' Courses

The primary source of learner data was the Individualised Learner Record (ILR) for 2019/20[6] which provided information on learners, apprentices, courses and providers (including FE colleges and private training providers) funded through further education and skills funding streams. The data analysis focused on learners who have a normal permanent residency within Greater London.

Identifying non-AEB Funded 'Green Skills' Courses

Whilst the primary focus of the research study was on the Adult Education Budget, green skills courses funded through other mechanisms were also reviewed, where these provide a progression pathway from the AEB and appeared on public datasets. This included:

- Apprenticeship Standards

[6] 2019/20 was used as the primary source of data due to the significant effect of Covid-19 on recruitment in 2020/21. The 2019/20 data source pre-dates the introduction of Level 3 flexibilities funded through the National Skills Fund (Annex C). From 2021/22 courses which were funded through Advanced Learner Loans may be eligible for AEB funding.

- FE Loan funded courses
- Level 4 and 5 prescribed HE courses

The evidence base for this analysis included the GLA Data Cube (derived from the ILR) and the Higher Education student record (HESA). Public data sources, however, cannot identify the scale and scope of commercial and in-house employer training provision and quantitative analysis of this area is therefore beyond the scope of this research study.

Identifying AEB Funded Courses that Support the Development of Green Skills

Building on research by Dierdorff et al. (2009; 2011) and their resulting O*NET-based classification of green jobs, GLA Economics has identified a list of detailed occupations (four-digit SOC2010 codes) likely to be affected by the transition to a greener economy. This offers a broad and inclusive framework for exploring the potential impacts of green economy activities and technologies on jobs and skills in London. For the purpose of this research, we use this list as a mechanism for mapping green SOC2010 occupations to existing qualifications and course details within the Individualised Learner Record (ILR) and its associated qualification databases. The ILR provides detailed information on learner numbers, trends in recruitment, learner characteristics (e.g. ethnicity, gender, deprivation based on home postcode) and provider details.

GLA Economics identified a total of 63 'green' occupations at SOC major groups 3-9. These occupations generally have an entry requirement at Level 3 and below, which corresponds to the qualification levels funded through the Adult Education Budget. The occupations were grouped into 11 broad categories that have then been mapped into the Sector Subject Area (SSA Tier 2) system used to classify post-16 qualifications within the ILR. The mapping process is shown in Figure 2.[7] The analysis primarily focuses on the 2018/19 academic year (the year prior to Covid-19)[8] but also includes three-year trends.

Qualifications within each of the relevant SSA Tier 2 groups include a small number of qualifications that are very green specific (e.g. installing heat pumps) but most of the qualifications are much broader and provide a wide range of different skills. These broader qualifications potentially include green content at a module or curriculum level and might provide progression to more specialised provision at a later date (e.g. general construction skills or engineering skills courses). Our analysis includes tables and commentary on both specialist and broader courses. Courses within an SSA Tier 2 group that are associated with non-green occupations (as identified by GLA Economics) have been excluded from the analysis.

In addition to the mapping at SSA Tier 2 level we also identified courses using a text search on common 'green terms' e.g. recycling, solar, heat pumps, conservation etc. This helped us to identify a relatively small number of courses that had been incorrectly coded to the wrong SSA Tier 2 within the ESFA's learning aims database. A full list of search terms is given in Annex A. The analysis includes a limited review of modules and course content for a selection of qualifications that had the largest numbers of enrolments. This analysis used the Ofqual Learning Aims Database as well as searches of awarding organisation documentation. Reviewing the 'green' content of all AEB courses was beyond the scope and timescale of the project.

[7] Any occupational mapping process is likely to be imperfect and the list of green occupations and qualifications used in the report should be taken as indicative of the main requirements to support the move to a greener economy, rather than a comprehensive assessment.

[8] Since 2018/19 some courses in our data will have been discontinued. However, discontinued courses tend to be either those with very low enrolment numbers or those which are being replaced by an updated qualification. In most cases there should be minimal impact on overall volumes from these changes.

Figure 2: RCU Green Skills Categorisation[9]

SOC2010	SOC2010 Unit Group Titles	Green Category	SSA T2	Area
5241	Electricians and electrical fitters	Green Increased Demand	4.1, 5.2	Building and Construction
5311	Steel erectors	Green Increased Demand	5.2	Building and Construction
5313	Roofers, roof tilers and slaters	Green Enhanced Skills	5.2	Building and Construction
5314	Plumbers and heating and ventilating engineers	Green Enhanced Skills	5.2	Building and Construction
5315	Carpenters and joiners	Green Increased Demand	5.2	Building and Construction
5319	Construction and building trades n.e.c.	Green Increased Demand	5.2	Building and Construction
5330	Construction and building trades supervisors	Green New & Emerging	5.2	Building and Construction
8142	Road construction operatives	Green Increased Demand	4.3/5.2	Building and Construction
8143	Rail construction and maintenance operatives	Green Increased Demand	4.3/5.2	Building and Construction
8149	Construction operatives n.e.c.	Green Increased Demand	5.2	Building and Construction
9120	Elementary construction occupations	Green Enhanced Skills	5.2	Building and Construction
4134	Transport and distribution clerks and assistants	Green Enhanced Skills	4.3	Transport and Storage
5231	Vehicle technicians, mechanics and electricians	Green Enhanced Skills	4.3	Transport and Storage
5237	Rail and rolling stock builders and repairers	Green Increased Demand	4.3	Transport and Storage
8142	Road construction operatives	Green Increased Demand	4.3/5.2	Transport and Storage
8143	Rail construction and maintenance operatives	Green Increased Demand	4.3/5.2	Transport and Storage
8211	Large goods vehicle drivers	Green Enhanced Skills	4.3	Transport and Storage
8213	Bus and coach drivers	Green Increased Demand	4.3	Transport and Storage
8229	Mobile machine drivers and operatives n.e.c.	Green Increased Demand	4.3	Transport and Storage
9260	Elementary storage occupations	Green Increased Demand	7.2	Transport and Storage
3112	Electrical and electronics technicians	Green New & Emerging	4.1	Transport and Storage
5111	Farmers	Green Enhanced Skills	3.1	Environment, Conservation and Agriculture
5112	Horticultural trades	Green Increased Demand	3.2	Environment, Conservation and Agriculture
5119	Agricultural and fishing trades n.e.c.	Green Increased Demand	3.1	Environment, Conservation and Agriculture
9112	Forestry workers	Green Increased Demand	3.2	Environment, Conservation and Agriculture
3550	Conservation and environmental associate profes	Green Increased Demand	3.4	Environment, Conservation and Agriculture
5113	Gardeners and landscape gardeners	Green Increased Demand	3.4	Environment, Conservation and Agriculture
9235	Refuse and salvage occupations	Green New & Emerging	3.4	Environment, Conservation and Agriculture
8124	Energy plant operatives	Green New & Emerging		Energy
3131	IT operations technicians	Green New & Emerging	6.1	Digital
3111	Laboratory technicians	Green Increased Demand	2.1	Engineering and Science
3112	Electrical and electronics technicians	Green New & Emerging	4.1	Engineering and Science
3113	Engineering technicians	Green Enhanced Skills	4.1	Engineering and Science
3119	Science, engineering and production technicians	Green Enhanced Skills	2.1, 4.1, 4.2	Engineering and Science
5225	Air-conditioning and refrigeration engineers	Green Enhanced Skills	4.1	Engineering and Science
5241	Electricians and electrical fitters	Green Increased Demand	4.1, 5.2	Engineering and Science
5249	Electrical and electronic trades n.e.c.	Green Increased Demand	4.1	Engineering and Science
5250	Skilled metal, electrical and electronic trades supe	Green Increased Demand	4.1,4.2	Engineering and Science
3116	Planning, process and production technicians	Green New & Emerging	4.2	Manufacture
3119	Science, engineering and production technicians	Green Enhanced Skills	2.1, 4.1, 4.2	Manufacture
5213	Sheet metal workers	Green Enhanced Skills	4.2	Manufacture
5214	Metal plate workers, and riveters	Green Increased Demand	4.2	Manufacture
5215	Welding trades	Green Increased Demand	4.2	Manufacture
5216	Pipe fitters	Green Enhanced Skills	4.2	Manufacture
5221	Metal machining setters and setter-operators	Green Increased Demand	4.2	Manufacture
5223	Metal working production and maintenance fitters	Green Increased Demand	4.2	Manufacture
5224	Precision instrument makers and repairers	Green Increased Demand	4.2	Manufacture
5250	Skilled metal, electrical and electronic trades supe	Green Increased Demand	4.1,4.2	Manufacture
8114	Chemical and related process operatives	Green Increased Demand	4.2	Manufacture
8125	Metal working machine operatives	Green Increased Demand	4.2	Manufacture
8131	Assemblers (electrical and electronic products)	Green Increased Demand	4.2	Manufacture
8132	Assemblers (vehicles and metal goods)	Green Increased Demand	4.2	Manufacture
8139	Assemblers and routine operatives n.e.c.	Green Increased Demand	4.2	Manufacture
3531	Estimators, valuers and assessors	Green New & Emerging	15.1	Finance and Business
3532	Brokers	Green New & Emerging	15.1	Finance and Business
3534	Finance and investment analysts and advisers	Green Enhanced Skills	15.1	Finance and Business
3541	Buyers and procurement officers	Green Enhanced Skills	15.1	Finance and Business
3565	Inspectors of standards and regulations	Green Enhanced Skills	15.2	Finance and Business
4131	Records clerks and assistants	Green Increased Demand	15.2	Finance and Business
3542	Business sales executives	Green Enhanced Skills	15.4	Customer Service and Retail
3543	Marketing associate professionals	Green New & Emerging	15.4	Customer Service and Retail
6215	Rail travel assistants	Green Increased Demand	7.1,7.3	Customer Service and Retail
7214	Communication operators	Green Increased Demand	7.1,7.3	Customer Service and Retail

[9] A Sector Subject Area may be relevant to more than one occupation. For example, electrical skills are required in both the Building and Construction Sector and the Transport and Storage Sector.

1.7 STRUCTURE OF THE REPORT

The report includes separate sections (Parts Two to Five) on the following key industrial sectors that have an important role to play in transitioning to net zero: Building & Construction; Transport & Logistics; Environment, Conservation & Agriculture; and Energy & the Circular Economy. Figure 3 shows how each sector links to the course mapping process described in section 1.6. The table also includes the corresponding terminology used for these sectors in the Green Jobs Taskforce report. Part Six of the report focuses on specialist enabling STEM skills required across a wide range of sectors. Part Seven reviews the need for general green awareness and skills courses that provide all individuals and businesses with the skills needed to reduce carbon emissions. The final section of the report summarises current AEB 'green skills' provision, highlights a number of key emerging themes and lists a number of recommendations for the GLA.

Figure 3: Report Structure Mapped to Green Qualification Categories and Green Job Task Group Report

Report Section	**Green Qualification Category** (Based on mapping SSAs to GLA Economics Green Occupations**)**	**Green Job Task Group Report** (Job Categories)
Part Two: Building and Construction	Building and Construction (SSA 5.2, 4.1)	Homes and Buildings
Part Three: Transport and Logistics	Transport and Storage (SSA 4.3, 7.2)	Transport
Part Four: Environment, Conservation & Agriculture	Agriculture and Horticulture (SSA 3.1, 3.2) Environment and Conservation (SSA 3.4, 5.3)	Natural Resources
Part Five: Energy and the Circular Economy	Energy (No unique SSA – uses text search)	Power
Part Six: Enabling Skills - STEM (Specialist skills required by a wide range of different industrial sectors)	Engineering and Science (SSA 4.1,2.1) Digital (SSA 6.1, 6.2) Manufacturing (SSA 4.2)	Enabling Decarbonisation
Part Seven: Generic Skills (Generic skills relevant to all individuals and businesses to help reduce carbon emissions and waste)	Project Management (SSA 7.1, 15-4) Green Finance (SSA 15.1, 15.2) Customer Service, Marketing and Retail Green Awareness	No corresponding category

PART TWO: BUILDING AND CONSTRUCTION

2.1 INTRODUCTION

Introduction

This section of the report focuses on green skills issues in the Building and Construction sector and includes data on AEB funded courses, apprenticeships and FE Loans. Building and Construction is by far the largest green skills category in Greater London in terms of AEB and apprenticeship learner numbers. Th~~is~~ section of the report also includes findings from fieldwork interviews with providers (including London Boroughs) and employers in the Building and Construction sector.

Background Context

The CITB states that with 40% of total emissions coming from construction and the built environment[10], the construction industry has a key role to play in reducing greenhouse gas emissions in the UK, in line with the Government's net zero target by 2050. However, meeting this target would require a rapid and lasting transformation of the construction sector, which would include industry-wide investment in skills, far-reaching skills policy reform and an unprecedented recruitment drive. The CITB perceive there to be a major shortfall of skills across a large number of trades and professions within the construction industry. Modelling from the Climate Change Committee[11] shows that rapid scaling up of supply is required over the next 7 years, peaking in 2028.

The UK Green Building Council (Impact Report 2019-20)[12] estimates that up to 95% of emissions from the built environment over the next 30 years could come from buildings that exist today. Most of the effort to decarbonise, they believe, must therefore be focused on the energy efficiency retrofit of existing buildings. Outside of the social housing market, the report states that there is currently very little activity in energy efficiency retrofit, and very little capacity. Even with new ways of working, the report states that we will need to recruit, train and in some cases retrain large numbers of people to do this work. Construction skills required will include general repair and maintenance skills, project management skills and specific trade skills including retrofitting (draft proofing, insulation, boiler replacement to heat pumps). In addition, skills will be required in surveying (to assess condition), energy evaluation skills (to model current performance) and digital / design skills (for design and spec of upgrade required).

The Green Jobs Taskforce states that due to climate change, buildings are already being challenged with weather conditions for which they were not originally designed. This means that building a net zero retrofit sector will require a continuous need for adaptations to be taken into account in the long run.

Net zero ambition will also lead to tightened regulation around many elements of new building design and construction, which the skills system will need to reflect. Regulation is likely to affect those aspects related to energy performance, such as insulation, airtightness, air quality and energy systems. It is likely that tightened building standards will lead to increased adoption of smart digital construction. The London Plan

[10] Building Skills for Net Zero (CITB, March 2021)
[11] The Sixth Carbon Committee: The UK's path to Net-Zero (Climate Change Committee, December 2020)
[12] Impact Report 2019-20 (UK Green Building Council, July 2020)

2021 states that a net zero target for major residential developments has been in place for London since October 2016 and will apply to major non-residential developments from 2021.

In London, the Mayor has established a Construction Academy scheme with the homebuilding industry, utilising the Adult Education Budget, to help address the construction skills shortage in the capital. The scheme aims to increase London's capacity to build new homes in order to help tackle London's housing crisis. London's total construction output is forecast to rise by an annual average of 1.5 per cent between 2018 and 2022, with housing accounting for 50 per cent of this growth. Public housing construction is set to grow strongly over this period, averaging 3.6 per cent each year, with private housing construction work seeing an average annual growth of 3.0 per cent[13].

Among the occupations GLA Economics has identified as being affected be greening, there are several which are relevant to the Building and Construction sector. Some of these occupations will require new or enhanced skills (e.g. plumbers and heating and ventilation engineers needing skills to fit heat pumps) whilst others may require greater numbers of trained individuals to meet growing demand (e.g. carpenters and joiners). Whilst the GLA Economics analysis is not intended to be exhaustive, it provides a very useful way of mapping 'green skills' occupations to relevant courses currently being delivered under the Adult Education Budget and other funding streams.

Figure 4: Green Occupations in Building and Construction

SOC10	**Occupation**	**Green Occupation Type**
5313	Roofers, roof tilers and slaters	Green Enhanced Skills
5314	Plumbers and heating and ventilation engineers	Green Enhanced Skills
9120	Elementary construction occupations	Green Enhanced Skills
5241	Electricians and electrical fitters	Green Increased Demand
5311	Steel erectors	Green Increased Demand
5319	Construction and building trades	Green Increased Demand
5315	Carpenters and joiners	Green Increased Demand
8149	Construction operatives	Green Increased Demand
5330	Construction and building trade supervisors	Green New and Emerging

[13] Skills for Londoners: A Skills and Adult Education Strategy for London (Mayor of London, June 2018)

2.2 RESEARCH FINDINGS: FIELDWORK

All providers and employers that we spoke to recognised that moving towards a net zero economy had important implications for skills within the Building and Construction sector. Overall, it was felt that this was work in progress and significant challenges and barriers remained. At the current time most AEB-funded courses in Building and Construction include a broad range of skills rather than focusing on specific 'green skills'. Both employers and providers felt that it was important that training provided for a long-term career in the construction industry rather than meeting short term needs. Apprenticeships are seen as the primary entry route into employment and the AEB can provide a stepping-stone into an apprenticeship. The AEB also provides potential funding for upskilling or retraining of already qualified employees but both employers and providers felt that the current system lacked responsiveness due to delays in accreditation.

Summarised below are key issues emerging from interviews with employers and employer bodies, providers and London Boroughs. A full list of interview respondents is given in Annex B.

<u>Employer Views</u>

1. Developing an appropriate skills infrastructure requires a clear national retrofit strategy. The failure of the Green Homes Grant has made many employers and providers reluctant to move quickly in investing in skills and training in this area. National and regional government need to provide confidence to employers and training providers so that they can see the long-term pipeline of work to justify investment in skills and training.
2. Current skills needs identified by the sector that will need to be met in the near future include:
    - Heat pumps - perceived to be a big demand requiring a significant number of heat pump installers to be trained (no overarching qualification for this exists)
    - Improving building fabric first before installing heat pumps, in order to improve efficiency
    - Modern methods of construction
    - Insulation and building treatments
    - Project management of retrofit
    - Retrofit coordinators
    - Adaptation of buildings to take into account the impact of climate change
3. Plumbers will need upskilling for the installation of hydrogen boilers and heat pumps. Research from the CITB identified about 130,000 gas safe engineers (nationally) that would require this upskilling.
4. The overall volume of individuals entering the Building and Construction sector needs to increase if we are to meet the needs of the net zero economy. This requires good quality careers advice in schools.
5. Training programmes should focus on additional skills for existing employees rather than just creating new roles. Multi-skilling will be very important in the future. Microcredentials[14] could have an important role to play in this area.
6. An important new skill development area is the need to understand the building as a system and to identify how the different elements within a building work together and interact. It would be useful

[14] Microcredentials are short, modular, stand-alone products, designed to meet specific learner and employer needs and offer a qualification in their own right. Microcredentials in higher education are normally used for continuing professional development.

to have a general training module to address this area, that can be bolted on to existing qualifications or offered as a top up.

7. Design skills are more important than ever (working out what size heat pump is needed, how it can be optimised, etc).
8. There are certain gaps in the current training of modern methods of construction. Offsite modular manufacture is potentially more sustainable than traditional construction methods with less waste, lower transport costs, less noise pollution and the use of lighter more sustainable materials. Most training focuses on new builds so misses the skills required for retrofit and traditional buildings. These qualifications need to be reviewed.
9. Lots of activity is going on in the sector right now on looking at the implications of net zero and there is a big appetite and demand for information at a local level. Organisations such as the CITB don't have any regional level analysis, so any analysis is largely based on the national picture.
10. The demand for green construction skills isn't currently at a critical mass level and is seen as a future rather than a present need. Training providers are therefore reluctant to run courses in this area.
11. There are a lot of companies who already have sufficient work to keep them busy and don't have the capacity or desire to get involved in new energy and retrofit schemes.
12. The supply chain for retrofit is not currently in place and this will take time to develop (this was one of the problems of the Green Homes Grant).
13. It is important to consider how skills training can support long term career development. Transferable skills are needed to ensure longevity of employment when all of the retrofitting work is done.

<u>Provider Views</u>

1. Training people to fit heat pumps, retrofitting etc. is seen as an important area for college development and provides a possible initial route into employment. However, developing the facilities and training staff to teach students requires a large financial investment. Colleges need to be confident that there is a critical mass of people currently looking to be trained in green construction skills in order to make investment viable. It is too risky for many colleges to make significant investment in this area unless it can be assured there will be demand.
2. There doesn't appear to be significant demand for heat pumps etc. emerging from homeowners or landlords at the current time. A high proportion of the plumbing and heating engineering businesses in Greater London have not embraced or acknowledged the pressing need to change domestic housing heating systems away from carbon-based systems. They are currently more profitable servicing and fitting new gas boilers so do not see the need to change their business model.
3. There is some demand for training in the installation and maintenance of heat pumps from existing plumbers and heating engineers looking to upskill in new green technology. These are either self-employed or working for small businesses looking to develop niche markets in heat pump installation. Short, focused 'micro-qualifications' need to be developed to meet this demand.
4. Retrofit training should be focused on large organisations and the non-domestic market. Local authorities have a key role to play with upgrading social housing. This will help to stimulate retrofit

training. The domestic market will come later when the economics are right. The retrofit market is waiting for Government action in this area.

5. The green skills academy's focus and expertise will be on retrofitting the heating systems within the existing housing stock in London. It is a huge task to achieve net zero emissions from housing by 2050 when there are hundreds of thousands of properties that will need to convert to non-carbon heat sources.
6. It would be helpful to have a group of employer champions who embrace the decarbonisation agenda and who can clearly explain what their skills needs are so that colleges can invest with some confidence in the facilities and equipment the sector will be demanding.
7. A national or regional campaign to inform people that gas boilers will have to be replaced in the near future would help stimulate public demand. At the moment the message is confusing and there are examples of misinformation. For example, the gas lobby is pushing hydrogen as a better alternative to heat pumps because the installation is easier and comparatively few new skills are required.
8. The Level 3 Lifetime Skills Guarantee is a great opportunity to get people trained in green skills but there is very little on the current approved course list that addresses the green agenda. The list is still focused on traditional construction skills such as bricklaying and plastering etc. The Diploma in Installation has been adapted by one college to include a unit on heat pumps, but it isn't on the approved list.
9. As demand for retrofitting grows there may be a lot of disreputable companies and individuals stepping into the installation market. There needs to be clear regulation and standards, with approved installers having completed kitemarked qualifications. The GLA could have a role to play in helping to ensure that standards are developed and adhered to.
10. Apprenticeships are seen by many providers as the primary initial route into the construction industry. However, whilst there is demand from employers for retrofit apprentices, providers feel that it is a struggle recruiting new apprentices in this area.
11. The AEB has a key role to play in upskilling adults already working in the industry. Awarding Organisations can be slow, however, in updating qualifications to meet the emerging needs of a low carbon economy. Commercial training is often seen as a better alternative, allowing providers to be more responsive to employer needs.

2.3 RESEARCH FINDINGS: DATA ANALYSIS

Sections 2.4 and 2.5 provide a detailed analysis of learner data in the Building and Construction sector, primarily focusing on courses funded through the AEB as well as providing a brief overview of apprenticeships and loan funded courses.

Summarised below are key findings from the data analysis.

1. Building and Construction is the occupational area that has the largest number of AEB funded learners on 'green skills classified' courses. In 2019/20 there were 6,250 learners in this area.

2. The vast majority of learners in this category are enrolled at further education colleges. The proportion of ethnic minorities taking these courses is higher than the proportion of ethnic minorities in the London population as a whole.
3. More than a quarter of learners had a home postcode in the most deprived quintile in England and 42% in the second most deprived quintile. Very few learners lived in the most affluent parts of Greater London.
4. Most of the AEB funded learners in this area were taking traditional building and construction courses (e.g. plumbing, carpentry, general construction skills etc.), rather than courses providing specific skills required to support a low carbon economy (e.g. installing heat pumps).
5. The AEB funded course that is most specifically developing 'green skills' is the Diploma in Refrigeration, Air Conditioning & Heat Pump Systems, which had 80 learners in 2020/21. This appears to be an insufficient volume to support future demand across Greater London.
6. Popular courses such as the Diploma in Plumbing Studies and Diploma in Electrical Installation provide a progression pathway for people who are entering the profession who wish to become skilled trades people. Initial review of the course content suggests that there may be scope for introducing new and updated units on green skills.
7. The Adult Education Budget funds a range of Entry Level Building and Construction courses that provide initial practical experience in trades such as bricklaying, joinery, plastering, plumbing, painting & decorating etc. These courses require no prior qualifications or experience and offer a possible route into employment for the unemployed. In 2019/20 the ILR recorded no AEB funded courses in this area specifically targeting the needs of the green economy (such as retrofitting).
8. Most of the AEB funded courses were at Level 2 and below and were targeted at new entrants to the profession. There was little evidence of active CPD courses and 'micro qualifications' for adults already employed in the sector, in the field of green skills, funded through the Adult Education Budget. A good example is Capel Manor's LANTRA and other industry training courses in Environment, Conservation and Agriculture. This is a possible area for future development.
9. There are several apprenticeship standards in Building and Construction that are helping to develop green skills. These include Refrigeration, Air Conditioning & Heat Pump Engineering Technician, Industrial Thermal Insulation Technician and Building Services Engineering Installer. However, learner numbers on these apprenticeships are relatively small. Active partnership between employers, providers and the GLA would be needed to address this potential shortfall.
10. Initial analysis suggests that there is a wide variation in the availability of green skills courses in Building and Construction by London Borough.
11. There are several Level 4 and 5 qualifications available in Building and Construction across London that offer possible progression routes for AEB funded learners. However, the number of learners enrolled on these courses is relatively small.

2.4 OVERVIEW OF CURRENT ADULT SKILLS PROVISION

The data in this section focuses on learners who have a Greater London postcode. Three years of data (2018/19, 2019/20 and 2020/21) are included but the data from the 2020/21 is only for part of the year (up to February 2021) so cannot be directly compared with data from previous years. Also, recruitment in 2020/21 will have been severely affected by Covid-19, so learner numbers in this year may not be a good indicator of long-term trends. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 5 shows that in 2019/20 there were 5,740 learners in Greater London taking Building and Construction AEB courses associated with green occupations (identified by GLA economics). This was a 4% decline in learner numbers compared to the previous year.

Figure 5: AEB Learners – Building and Construction Green Skills Category

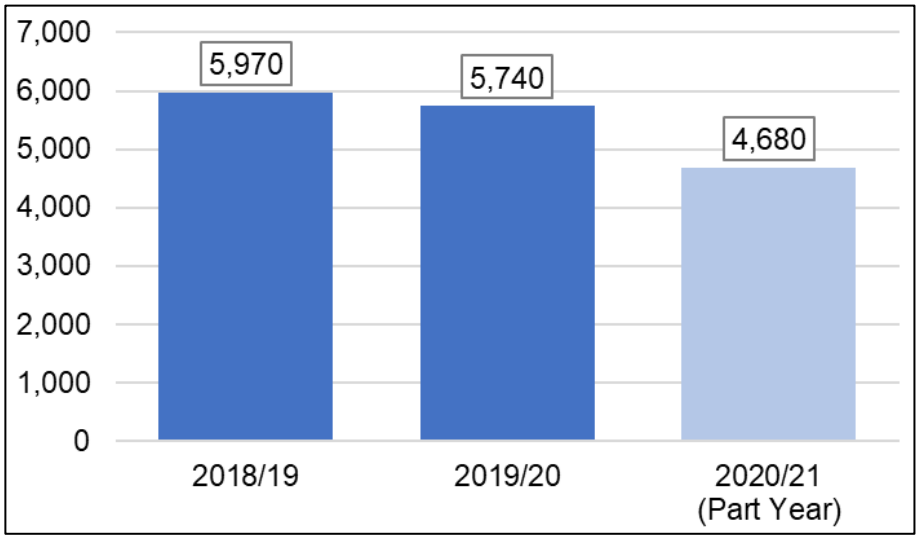


Figure 6: Enrolments and Learners – Building and Construction Category

Year	Enrolments	Learners
2018/19	6,470	5,970
2019/20	6,440	5,740
2020/21 (Part Year)	4,990	4,680

In 2019/20, more than 93% of these AEB funded learners were enrolled at colleges with relatively small numbers enrolled with Private Training Providers and Local Authorities (Figure 7).

Figure 7: AEB Learners Building and Construction Category by Provider Type 2019/20

Provider Type	**2018/19**	**2019/20**	**2020/21**
Colleges	5,350	5,330	4,230
Other Public Funded - LAs	180	150	70
Private Training Providers	450	260	380

AEB Funded Learners Building and Construction 2019/20

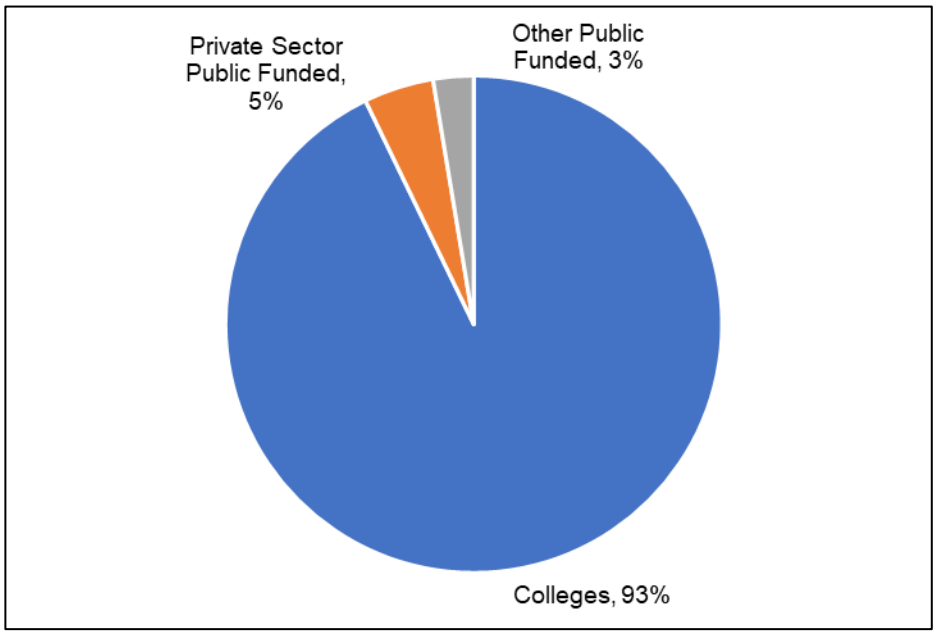
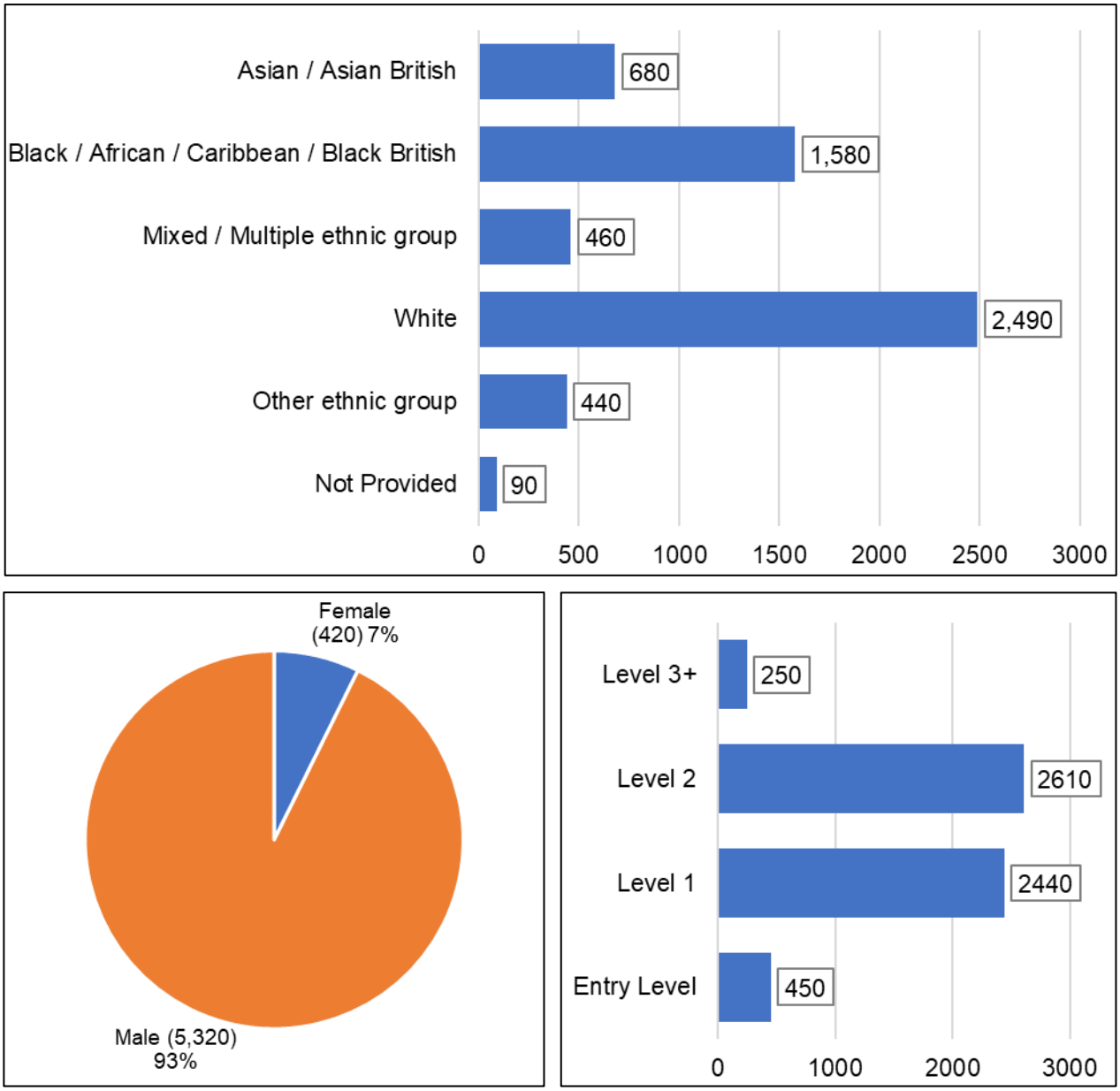


Figure 8 show the breakdown of Building and Construction learners on courses designated as green by ethnicity, sex and level of study. The overwhelming majority of learners were male (93%) and were studying at either Levels 1 or 2. This suggests that very few of these learners will be progressing to higher technical education.

Approximately 43% of learners were White, 28% Black/African/Caribbean/Black British and 12% Asian/Asian British. This is a higher proportion of ethnic minorities and a lower proportion of White compared to the population of Greater London as a whole.

Figure 8: AEB Learners Building and Construction Category by Learner Characteristics 2019/20



The deprivation profile of green classified Building and Construction learners is shown in Figure 9. More than a quarter of learners had a home postcode in the most deprived quintile in England and 41% in the second most deprived quintile. Very few learners lived in the most affluent parts of Greater London.

A high proportion of learners lived in Brent, Croydon, Newham, Enfield and Southwark (Figure 9). Very few learners lived in Boroughs to the South West of London.

Figure 9: AEB Learners Building and Construction Category by Deprivation Band 2019/20

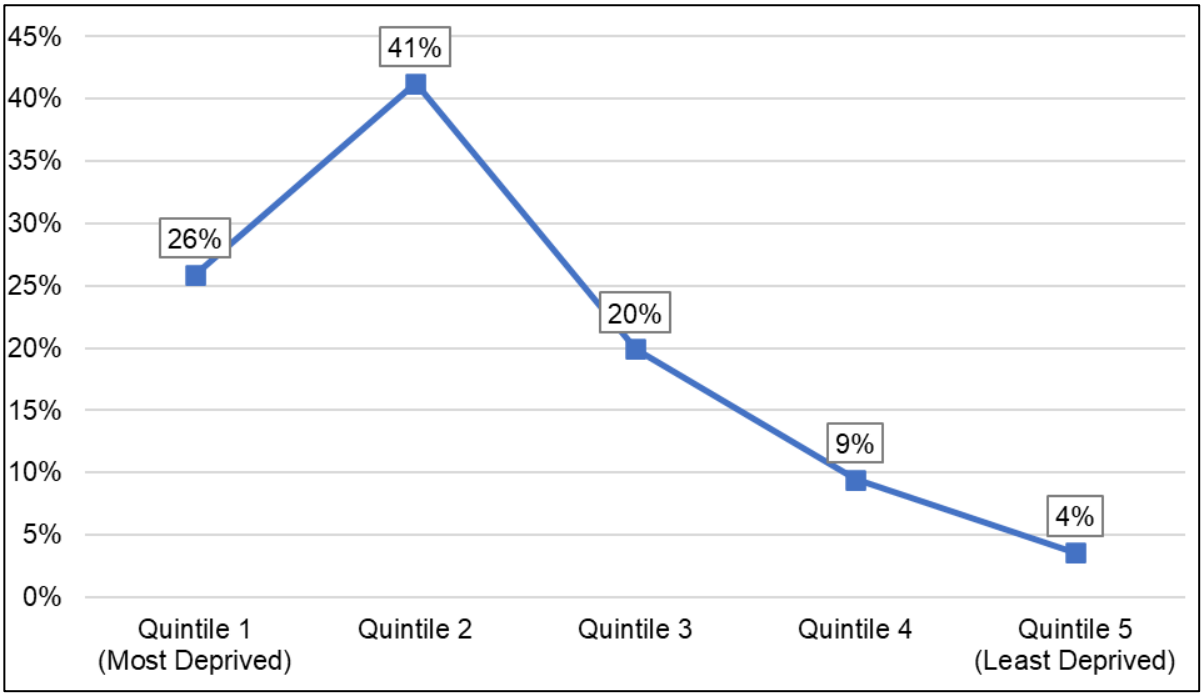
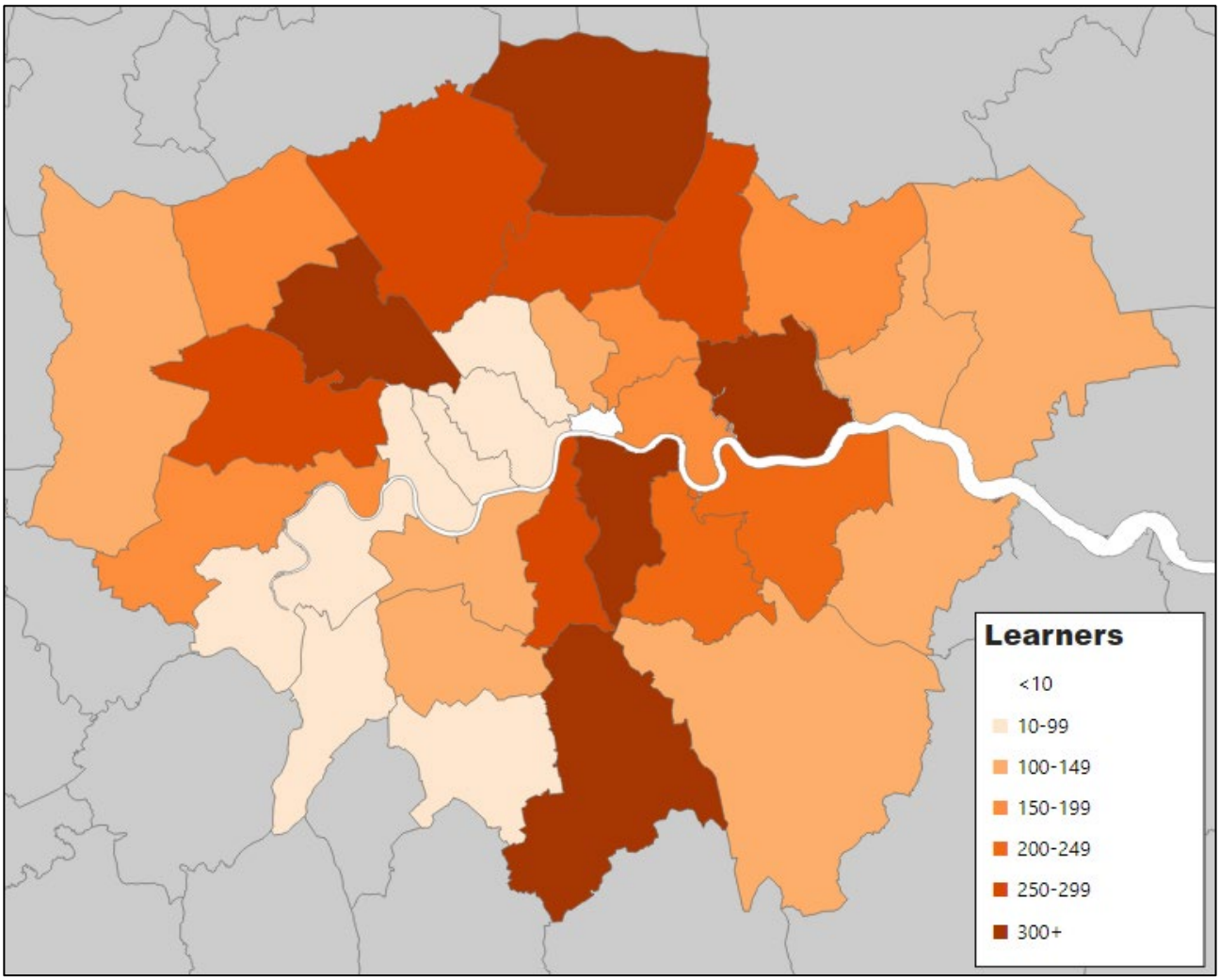


Figure 10: AEB Building and Construction Category by London Borough 2019/20



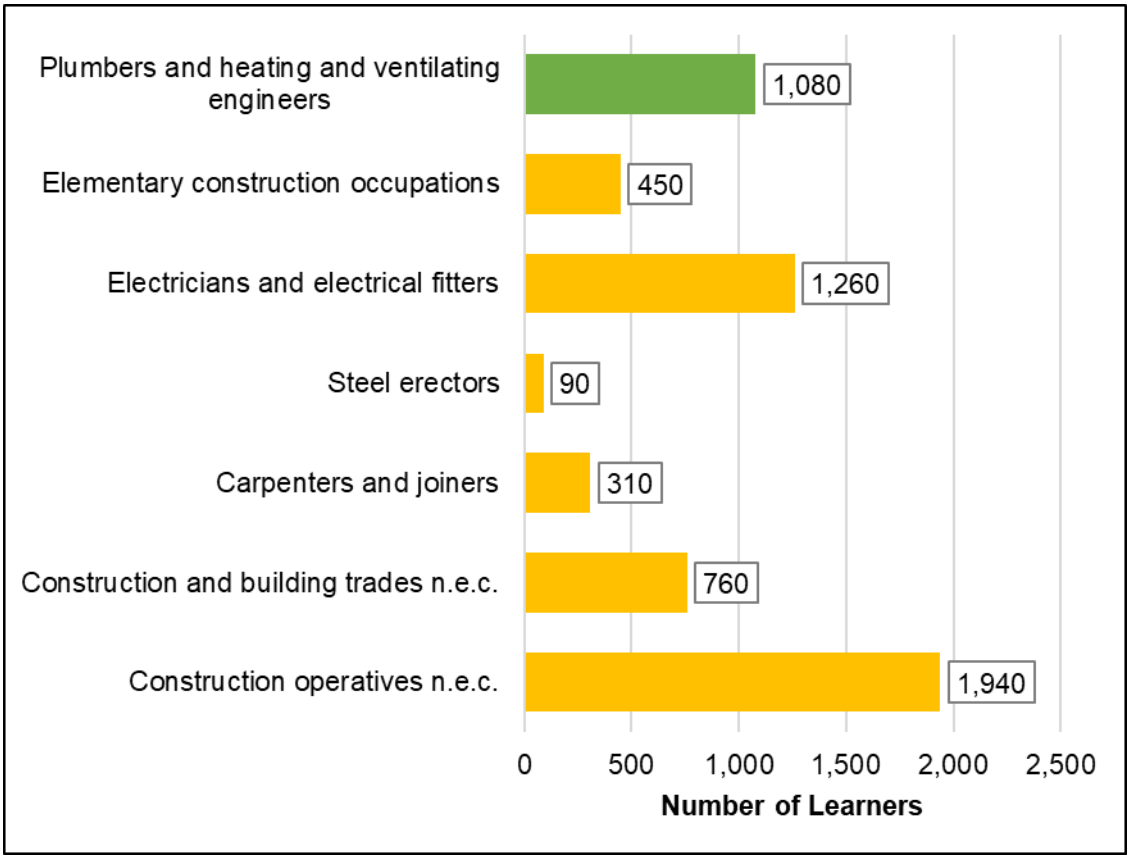
2.5 DETAILS OF PROVISION BY OCCUPATION

Figure 11 shows the 2019/20 AEB learner numbers in a range of green occupations (SOC10) identified by GLA Economics. Only those occupations that had 10 or more enrolments are shown. The yellow bars in the chart indicate occupations that will require additional enhanced skills to meet the needs of a net zero economy. The green bars show occupations where there is likely to be increased demand, but the skills required will not change significantly from those currently in place.

The vast majority of AEB provision in the Building and Construction sector, relevant to the green agenda, is focused on Plumbers, Heating & Ventilation Engineers, Electricians & Electrical Fitters and Construction Operatives.

In 2019/20, there were more than 1,000 learners on plumbing, heating and ventilation AEB courses and more than 1,200 learners on electrician/electrical fitters' courses. Both areas provide important skills needed to achieve a net zero target by 2050.

Figure 11: AEB Learners – Building and Construction Learners by Occupation 2019/20



Details of AEB funded courses and associated learner numbers for each of these occupational areas, are discussed below. For information we have also included tables on relevant Apprenticeship Standards and FE Loan funded courses.

Plumbers and heating and ventilation engineers

All AEB funded courses in this area (Figure 12) are validated by City and Guilds. The Diploma in Refrigeration, Air Conditioning & Heat Pumps is one of the few AEB courses that specifically focuses on the green agenda, providing the skills required to install heat pumps. In 2019/20 there were 60 GLA residents enrolled on this course. The Diplomas in Plumbing Studies are a popular range of courses offered at Levels 1, 2 and 3 and in 2019/20 almost 1000 learners were enrolled on these programmes.

Whilst the Diploma in Plumbing Studies provides a wide range of skills needed for all aspects of the plumbing trade, it also includes reference to installing heat pumps within the content of some of the course units. Learners progressing through the Diploma in Plumbing route will potentially be able to support the retrofitting requirements across Greater London.

Figure 12: AEB Funded Enrolments Plumbing and Heating Ventilation Engineers[15]

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Plumbing Studies	Level 2	Large	660	740	560
Diploma in Plumbing Studies	Level 1	Medium	210	200	250
Diploma in Refrigeration, Air Conditioning and Heat Pump Systems	Level 2	Large	60	60	80
Diploma in Plumbing Studies	Level 3	Large	50	40	10
Award in Construction Skills (Plumbing)	Level 1	Medium	20	50	0

[15] Large is defined as greater than 450 guided learning hours, equivalent to a full-time course. Medium is defined as 120-450 hours and short as less than 120 hours.

Figure 13 shows recruitment to apprenticeship standards for Plumbing and Heating & Ventilation Engineers. The standard in Refrigeration, Air Conditioning & Heat Pump Engineering Technician is the most relevant to the green skills needs of Greater London with 40 learners enrolled in 2020/21. Numbers of learners on this programme are likely to grow significantly as the demand for heat pump installation increases in the future. The apprenticeship standard in Dual Fuel Smart Meter Installer (89 enrolments in 2020/21) also provides important green skills (smart monitoring of energy usage in both commercial and domestic settings is likely to become a key tool for reducing carbon emissions). The apprenticeship standard in Plumbing & Domestic Heating Technician provides general initial training in plumbing skills and includes reference to heat pump installation etc.

Figure 14 shows recruitment to Plumbing and Heating Ventilation courses funded through FE Loans. All of these are at Level 3 and are long programmes (greater than 450 guided learning hours). The majority of learner are taking gas related courses. Whilst these individuals are likely to need retraining in the future as gas appliances are replaced by renewable energy sources, they will have acquired valuable transferable skills.

Figure 13: Apprenticeship Standards Starts Plumbing and Heating Ventilation Engineers 2020/21

Apprenticeship Standard Title	**Level**	**20/21**
Plumbing and domestic heating technician	Level 3	129
Dual fuel smart meter installer	Level 2	89
Gas engineering operative	Level 3	42
Refrigeration air conditioning and heat pump engineering technician	Level 3	40

Figure 14: Advanced Learner Loan Enrolments Plumbing and Heating Ventilation Engineers

Learning Aim Title	**Level**	**Size**	**18/19**	**19/20**	**20/21**
Diploma in Gas Utilisation	Level 3	Long	170	140	100
Diploma in Gas Engineering	Level 3	Long	40	120	100
Diploma in Gas Utilisation Installation and Maintenance: Water Heating and Wet Central Heating	Level 3	Long	80	70	80
Diploma in Plumbing Studies	Level 3	Long	40	30	0
Advanced Diploma in Electrical Installation	Level 3	Long	0	0	40

Elementary Construction Occupations

AEB funded courses in Elementary Construction Occupations (Figure 15) are all at Entry Level and are of short or medium duration. These courses allow learners to develop the practical skills required for employment and/or career progression in the Construction trade and typically include initial skills training in bricklaying, joinery, plastering, plumbing, painting & decorating etc. The courses are suitable for individuals with no prior qualifications and experience and offer a possible career progression route for the unemployed. Individuals taking these courses may progress to more detailed training at Levels 2 and 3.

The courses could be adapted in the future to include more specific green skills training such as retrofitting.

Figure 15: AEB Funded Enrolments Elementary Construction Occupations

Learning Aim Title	**Level**	**Size**	**18/19**	**19/20**	**20/21**
Award in Introduction to Construction Careers (Entry 3)	Entry Level	Medium	190	100	40
Non-reg SFA formula funded provision, Entry Level, Building & Construction, 21-44 hrs, PW C	Entry Level	Short	140	120	0
Non-reg SFA formula funded provision, Entry Level, Building & Construction, 13-20 hrs, PW C	Entry Level	Short	0	150	40
Award in Construction Skills (Entry 3)	Entry Level	Medium	20	80	0
Non regulated SFA formula funded provision, Entry Level, Building and Construction, 45 to 68 hrs, PW C	Entry Level	Short	100	0	0
Certificate in Construction Skills (Entry 3)	Entry Level	Medium	50	30	10

Electricians and Electrical Fitters (Green Increased Demand)

GLA Economics research suggests that moving towards a net zero economy will lead to an increased demand for electricians and electrical fitters. These skills will be required for a wide range of tasks including supporting retrofitting, new-builds and the installation of electric car charge points. Learner numbers on AEB funded Electrician and Electrical Fitter courses are shown in Figure 16. The most popular course in 2020/21 was the City and Guilds Level 2 Diploma in Electrical Installations (Building & Structures) with over 1,000 enrolments. On successful completion of this qualification learners will acquire the practical skills and knowledge to further progress within the electrical industry, such as moving onto the Level 3 Electrotechnical Apprenticeship (Figures 17) or a Level 3 Diploma in Electrical Installations funded through FE Loans (Figure 18).

Figure 16: AEB Funded Enrolments Electricians and Electrical Fitters

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Electrical Installations (Buildings and Structures)	Level 2	Large	990	910	1,010
Diploma in Electrical Installation	Level 1	Medium	160	170	220
Diploma in Electrical Installations (Buildings and Structures)	Level 3	Large	140	160	50
Advanced Technical Diploma in Electrical Installation (450)	Level 3	Large	0	0	190
Certificate in Construction Skills (Electrical)	Level 1	Medium	0	30	30

Figure 17: Apprenticeship Standards Starts Electricians and Electrical Fitters

Apprenticeship Standard Title	Level	20/21
Installation electrician and maintenance electrician	Level 3	801
Electrical, electronic product service and installation engineer	Level 3	2

Figure 18: Advanced Learner Loan Enrolments Electricians and Electrical Fitters

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Electrical Installations (Buildings and Structures)	Level 3	Long	280	270	90
Diploma in Electrical Installation	Level 3	Long	300	60	0
NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	Level 3	Long	40	30	30
Advanced Technical Diploma in Electrical Installation (450)	Level 3	Long	0	0	60

Steel Erectors (Green Increased Demand)

Learner volumes in this occupational area are very low (Figure 19), with the most popular course being the City and Guilds NVQ Level 2 Diploma in Steel fixing Occupations. GLA Economics research suggests that there may be some increased demand for these kinds of roles and skills as we move towards a net zero economy (this could be, for example, due to new-builds and retrofitting, as well as supporting the installation of electrical charge point infrastructure). However, these are not identified as areas where significant new or enhanced green skills are likely to be required as a result of greening.

Figure 19: AEB Funded Enrolments Steel Erectors

Learning Aim Title	Level	Size	18/19	19/20	20/21
NVQ Diploma in Steelfixing Occupations (Construction)	Level 2	Medium	60	40	10
NVQ Diploma in Steelfixing Occupations (Construction)	Level 2	Medium	10	40	20
NVQ Diploma in Steelfixing Occupations (Construction)	Level 2	Medium	20	0	0

Figure 20: Apprenticeship Standards Steel Erectors

Apprenticeship Standard Title	Level	20/21
Steel fixer	Level 2	5

Carpenters and joiners (Green Increased Demand**)**

Carpentry and joinery is another green occupation identified by GLA Economics, where there is likely to be an increased demand for skilled trades people. AEB funded courses in this area are predominately at Levels 1 and 2 and learner volumes have remained fairly constant over the past three years (Figure 21).

The Level 2 apprenticeship standard in Carpentry and Joinery recruited 275 Greater London residents in 2020/21 (Figure 22). The NVQ Diploma in Wood Occupations (Figure 23), funded through FE Loans, recruited 50 learners in 2019/20. Both the AEB funded courses and the apprenticeships in this area include course content covering the importance of sustainability.

Figure 21: AEB Funded Enrolments Carpenters and Joiners

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Carpentry and Joinery	Level 1	Medium	70	60	90
Diploma in Site Carpentry	Level 2	Large	90	60	80
Certificate in Carpentry and Joinery	Level 1	Medium	90	50	40
Diploma in Site Carpentry (Construction)	Level 2	Large	40	20	40
Diploma in Carpentry and Joinery (Construction)	Level 1	Medium	20	30	20

Figure 22: Apprenticeship Standards Starts Carpenters and Joiners

Apprenticeship Standard Title	Level	20/21
Carpentry and joinery	Level 2	275
Advanced carpentry and joinery	Level 3	64

Figure 23: Advanced Learner Loan Enrolments Carpenters and Joiners

Learning Aim Title	Level	Size	18/19	19/20	20/21
NVQ Diploma in Wood Occupations (Construction)	Level 3	Long	140	50	20
NVQ Diploma in Wood Occupations (Construction)	Level 3	Long	20	10	10
Diploma in Site Carpentry	Level 3	Long	0	10	0

Other Construction and Building Trades (Green Increased Demand)

Figure 24 lists other AEB funded Building and Construction courses where there may be an increased demand as a result of a move towards a low carbon economy. The courses provide training in traditional construction specialisms that may be required for new builds or maintenance but are not specifically new 'green skill' areas. The most popular course in 2019/20 was the Level 2 Certificate in Removal of Non-Hazardous Waste (Construction). This is a work-based qualification that provides evidence of conforming to occupational standards.

Figure 24: AEB Funded Enrolments Other Construction and Building Trades

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Removal of Non-hazardous Waste (Construction)	Level 2	Medium	0	330	460
NVQ Diploma in Construction Operations and Civil Engineering - Construction Operations	Level 2	Medium	40	120	30
NVQ Diploma in Formwork	Level 2	Medium	70	80	30
NVQ Diploma in Formwork (Construction)	Level 2	Medium	60	80	20
NVQ Diploma in Specialist Concrete Occupations (Construction)	Level 2	Medium	40	50	10
NVQ Certificate in Construction and Civil Engineering Operations - (Construction)	Level 2	Medium	10	60	20

Apprenticeship standards in other building and construction trades where there may be an increased demand are shown in Figure 25. The most popular apprenticeship standard in 2020/21 was Property Maintenance Operative which had 148 enrolments. The knowledge requirements of this standard includes demonstrating and implementing energy, environment and sustainable practices.

The number of learners in this category taking courses at Level 3 and above, funded through FE Loans was very small and there was little evidence that these courses provided progression routes from AEB funded courses.

Figure 25: Apprenticeship Standards Starts Other Construction and Building Trades

Apprenticeship Standard Title	Level	20/21
Property maintenance operative	Level 2	148
Building services design engineer (degree)	Level 6	64
Civil engineering technician	Level 3	58
Building services engineering service and maintenance engineer	Level 3	47
Building services engineering technician	Level 4	46
Construction site engineering technician	Level 4	45
Building services engineering installer	Level 2	29
Formworker	Level 2	27
Building services engineering craftsperson	Level 3	22
Groundworker	Level 2	15
Building services design technician	Level 3	15
Piling attendant	Level 2	11
Interior systems installer	Level 2	9
Commercial thermal insulation operative	Level 2	6
Industrial thermal insulation technician	Level 3	2
Fenestration installer	Level 2	1
Construction design and build technician	Level 4	1
Building services engineering ductwork craftsperson	Level 3	1

2.6 POTENTIAL LEVEL 4/5 PROGRESSION ROUTES

There are a number of Level 4 and 5 qualifications in Building and Construction that could offer potential progression routes for AEB funded learners (figure 26). The most popular qualification in 2019/20 was the BTEC Higher National Certificate in Construction and the Built Environment which had 180 learners.

Figure 26: Level 4/5 Courses

Qualification	Level	19/20
BTEC Higher National Certificate in Construction and the Built Environment	Level 4	180
Higher National Certificate (HNC) in quantity surveying	Level 4	30
Higher National Certificate (HNC) in building surveying	Level 4	20
HND in Quantity Surveying (Full Time)	Level 5	20
Higher National Certificate (HNC) in construction management	Level 4	20
Foundation degree in building surveying	Level 5	10

Source ILR 2019/20 (Data Cube) & HESA 2019/20

PART THREE: TRANSPORT AND LOGISTICS

3.1 INTRODUCTION

Introduction

This section of the report focuses on green skills issues in the Transport and Logistics sector and includes data on AEB funded courses and apprenticeships. The report also includes findings from fieldwork interviews with providers and employers in the transport and logistics sector. In this report the Transport sector is deemed to encompass sub-sectors relating to low or zero emission vehicles, rail, aviation, maritime, public transport, cycling and walking.

Background Context

The London Plan 2021 outlines a sustainable approach which aims to reduce Londoners' dependency on cars in favour of city-wide shift to more walking, cycling and public transport use. The plan identifies that by 2041, the transport networks in London will need to cater for over five million additional trips each day which requires an urgent need to improve sustainable public transport capacity, connectivity, and quality of service.

The Green Jobs Taskforce include Transport as one of the priority sectors where change is crucial to meet the UK's net zero emissions target, and within this sector include low or zero emission vehicles, aviation and maritime, rail, public transport and walking or cycling. To achieve the Government requirement for all new cars and vans to be emission free by 2035, the Green Jobs Taskforce express concern that there are gaps in the automotive sector workforce that need to be addressed quickly, with a focus on retraining and upskilling workers in addition to new recruitment.

With the move to emission free vehicles, there is significant change on the horizon for the automotive sector and according to modelling carried out by the Faraday Institute, this will have a considerable impact on the labour market and skills supply UK wide. In its central growth scenario – in which the UK automotive sector remains stable and keeps pace with global EV market trends – the Faraday Institute projects the overall industry workforce of the automotive and EV battery ecosystem would grow by 29% from 170,000 to 220,000 employees by 2040. Much of the growth would be made up of 78,000 new jobs in new UK battery gigafactories and in their battery material supply chains. Around 75% of these new jobs would be Production Operators and Equipment Technicians which typically require Level 2 or Level 3 qualifications such as Advanced Manufacturing Engineering.

The Department for Transport report '*Decarbonising Transport, A Better Greener Britain*' states there is strong public support for action to remove transport's emissions to end the damaging contribution to climate change and create better places for us to live and work in. They also state that decarbonisation will deliver fundamentally better transport, making it faster, more efficient, cleaner and offer wider benefits including increased reliability and better connectivity. The Department for Transport however warns it will be essential to avoid a car led recovery as piling ever more cars, taxis and delivery vans on to our already congested urban streets will be difficult for the roads, let alone the planet to tolerate.

In the 2016 report, *On the Road to Sustainable Growth*, commissioned by the Institute of the Motor Industry (IMI), Professor Jim Saker identified a need for greater investment in specialist electric and hybrid vehicle

maintenance and repair training in order to keep up with growing demand. Professor Saker expresses great concern over the health and safety of unskilled mechanics attempting to work on machines with 600 volts running through them and reports that over 90% of independent garages said they need to retrain existing technicians to undertake work on these vehicles.

In addition to the move to zero emission vehicles, the Mayor's Transport Strategy for London presents an aspirational target for 80% of all trips in London being made on foot, by cycle, or by public transport by 2041. By improving and expanding sustainable methods of public transport and promoting a healthy streets approach, Transport for London (TfL) aim to make people's lives easier and increase the appeal of sustainable travel over private car use.

As one of the biggest purchasers of energy in London, TfL has taken steps to lead the way on green energy, launching a market test to be supplied with renewable power direct from generators with a view to being net zero by 2030. Determined to ensure London's green recovery and accelerate action on the climate emergency the Mayor of London, Sadiq Khan is keen to secure cost-effective and renewable energy for the rail network, with ambition to include the wider GLA group and beyond.

Decarbonisation requires a change in the way people travel in London, with greater reliance on sustainably powered public transport, pedal power and walking. The Mayor's Transport Strategy demonstrates a rethink on investment in transport, technology and skills to achieve this transition. In addition to green skills specific to the automotive industry, such as specialist electric and hybrid vehicle maintenance and repair, the Green Jobs Taskforce highlight the importance of cross-cutting skills including digital and data skills, project management, change management, and communication skills.

Several of the green occupations identified by GLA Economics are related to the Transport and Logistics sector and are likely to face skills issues as we move towards a net zero economy. Some of these occupations will require new or enhanced skills whilst others may require greater numbers of trained individuals to meet growing demand (e.g. rail construction and maintenance). Whilst the GLA Economics research is not intended to be exhaustive, it provides a very useful way of mapping 'green skills' occupations to relevant courses currently being delivered under the Adult Education Budget and other funding streams.

Figure 27: Green Occupations in Transport and Logistics Sector (GLA Economics)

SOC10	**Occupation**	**Green Occupation Type**
4134	Transport and distribution clerks and assistants	Green Enhanced Skills
5231	Vehicle technicians, mechanics and electricians	Green Enhanced Skills
8211	Large goods vehicle drivers	Green Enhanced Skills
8142	Road construction operatives	Green Increased Demand
8143	Rail construction and maintenance operatives	Green Increased Demand
9260	Elementary storage occupations	Green Increased Demand
3112	Electrical and electronic technicians	Green New and Emerging

3.2 RESEARCH FINDINGS: FIELDWORK

Summarised below are key issues emerging from interviews with providers, London Boroughs, employers and employer bodies. A full list of interview respondents is given in Annex B.

Employer Views

1. London based automotive dealerships are keen to upskill existing mechanics in how to service and maintain the new generation of hybrid and electric vehicles. It is believed that this would be achieved through the development of a suitable one-year apprenticeship with the majority of the training being delivered on block release at the manufacturers training headquarters rather than via local colleges.
2. Vehicle mechanics will need to become skilled in maintaining and servicing electric vehicles as demand for zero-emission cars increases. Health and safety is one of the main priorities, particularly when dealing with vehicle batteries.
3. Smaller independent garages are less able to afford to have staff away from the business for upskilling and feel at risk of being left behind as a result as the market progresses to zero-emission vehicles. Equally, the cost for local garages to change the equipment they have to manage the servicing of electric / hybrid vehicles is a huge issue. Smaller employers have voiced their opinion that once the servicing of the combustion engine comes to an end, they will likely consider closing the business and retiring.
4. Demand for the installation of EV charging points continues to grow, along with demand for maintenance and servicing technicians. Employers believe this demand will last for at least the next 15 years and is a good opportunity for colleges to invest in. Currently, employers see attracting and retaining EV charging point installers and maintenance and servicing technicians as a major challenge since the role is relatively mundane and repetitive. Typically, the role will be filled by qualified and certified electricians, but the fitting of charging points isn't in itself particularly skilled.
5. There is also a strong demand for digital skills as EV charging points gather a significant amount of customer data. Harvesting the data and having the skills to maximise the intelligence gathered is seen as a major challenge as there is significant demand across other industries for people with the same digital and data analysis skills. Similarly, employers need people with e-commerce skills as the public charging points require the customer to pay for the use. Currently, there are various approaches used and it is assumed the market will become ever more competitive as EV usage expands.
6. Marketing and customer service skills are also considered a skills gap in this sector. There is a significant challenge and opportunity in educating consumers and boosting confidence in using electric vehicles and public EV charging points. Both manufacturers and dealerships are keen to give customers reassurance and support so they can make informed decisions when switching to an electric vehicle. This requires good sales and customer service skills.
7. Employers feel GLA could support the sector by providing financial support to small local garages and dealerships to enable them to release staff to be trained in servicing and handling electric / hybrid vehicles. Many dealers that take on apprentices, report that the funding to train the apprentice is significantly lower than the actual cost of the training.
8. Alternative employers, such as those providing zero-carbon, pedal powered logistics and transport options in London are an inherently sustainable solution. However, they exist in an extremely

competitive market and don't believe that people or organisations will switch over to using bicycle couriers purely because they are a green solution. In this case, sales and customer service skills are increasingly important as doing a great job and providing excellent customer service is more likely to result in repeat business and drive growth.

9. Supporting bicycle couriers and improving the active travel infrastructure within London is in line with the Mayors Transport Strategy. Employers in this unique sector feel GLA could help by ensuring access to important transport routes in central London are open to bicycle use. Current restrictions prohibit bicycles from accessing certain routes which puts such employers at a disadvantage when competing for business in these areas.

Provider Views

1. A number of colleges in London have developed or are starting to develop provision in response to the electrification of vehicles. Providers believe it is important that they remain flexible and responsive to ensure the needs of local industry is met.
2. One provider is developing facilities in this space with a view to be delivering more specialist courses covering electric vehicles, first stage AA response training, breakdown, recovery, maintenance and fixing EVs within the next two years.
3. Another provider is further ahead in this journey and has already developed commercial training with local employers focusing on EV chargers and maintaining electrical vehicles, including both cars and motorbikes. These courses are not accredited. The provider's view is that the awarding organisations take too long to approve new qualifications and those that are currently available, such as the IMI Hybrid Vehicle qualification doesn't go far enough to meet the needs of local industry. There is a need for properly accredited qualifications in this area which are linked to funding and credit based qualifications to support local employers.
4. Providers are using their employer networks effectively on a range of relevant sustainability projects. Examples include exploring the impact of the transport and logistics network on the environment, making use of green electric generators and transport, and developing eco-friendly training courses to up-skill employees, using EV chargers and specialist kit supplied to the college by the employer.
5. Upskilling residents working with smaller employers, such as local independent garages, is likely to prove difficult. Large employers will therefore have a role to play in supporting their local supply chain to acquire new skills.
6. Developing a wide range of transferable skills is important for people starting out in the industry. Green skills are often at Levels 3/4/5/6 and are delivered alongside other skills rather than as stand-alone qualifications.
7. Providers feel that the GLA have a role to play in opening doors to employers and sign posting them to colleges.

3.3 RESEARCH FINDINGS: DATA ANALYSIS

Sections 3.4 and 3.5 provide a detailed analysis of learner data in the Transport and Logistics sector, primarily focusing on courses funded through the AEB as well as providing a brief overview of apprenticeships and loan funded courses.

Summarised below are key findings from the data analysis.

1. The Transport and Logistics sector has attracted a growing number of AEB funded learners on courses associated with green occupations (identified by GLA Economics), with learner numbers in this area increasing from 3,430 in 2018/19 to 3,760 in 2019/20. Most of these courses are introductory, cover a broad range of topics or focus on particular specialisms (e.g. electrical technician work).
2. A review of the AEB funded provision courses (section 3.5) identified very few qualifications which contain specific 'green' content or context. Typically, green skills units identified are those which consider issues such as the impact of waste on the environment, health and safety as an issue linked to working with EVs or management of waste materials. There appears to be a need to review course content to ensure that in the future it meets the needs of a low carbon economy (e.g. adoption of electric cars and smart transport infrastructure).
3. Apprenticeship standards typically include more relevant green skills content such as an awareness of environmental sustainability, and how this can be influenced by transport and travel planning or by manufacturing practices.
4. Learners in this sector are predominately male, are studying at Levels 1 and 2 and come from a diverse ethnic background. Learners enrolled are more likely to live in areas of higher deprivation.
5. In recent years, Private Training Providers have increased their market share within this sector.

3.4 OVERVIEW OF CURRENT ADULT SKILLS PROVISION

The Transport and Logistics sector attracted a growing number of AEB funded learners on courses associated with green occupations (identified by GLA Economics) in recent years, with learner numbers in this area increasing from 3,430 in 2018/19 to 3,760 in 2019/20. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 28: AEB Learners – Transport and Logistics Green Skills Category

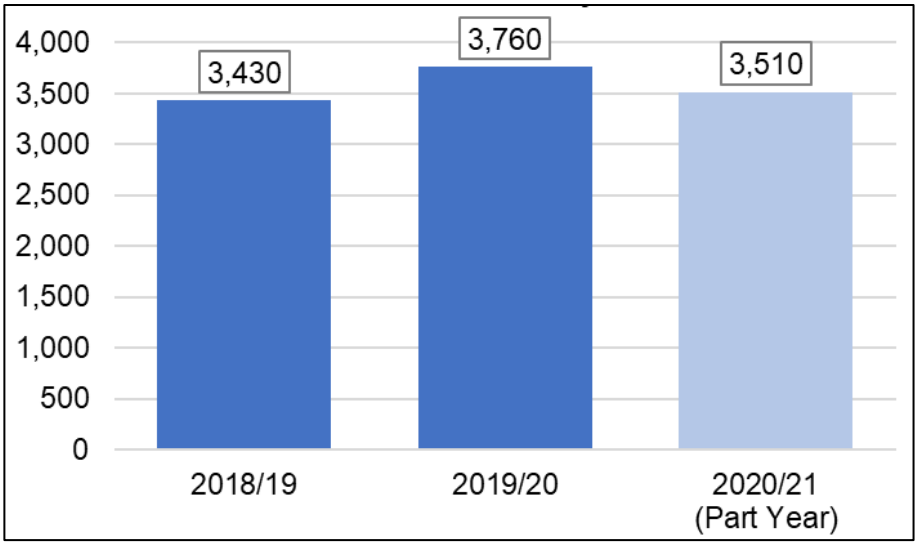


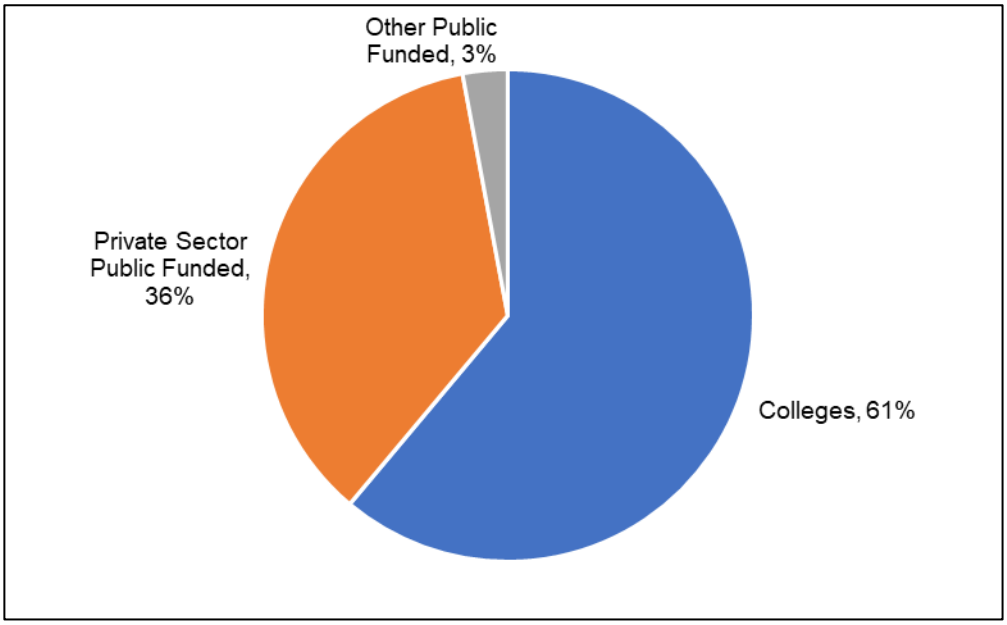
Figure 29: AEB Enrolments and Learners – Transport and Logistics Category

Year	Enrolment	Learners
2018/19	3,830	3,430
2019/20	4,550	3,760
2020/21 (Part Year)	4,340	3,510

In recent years, Private Training Providers have increased their share of Transport and Logistics learners compared to GFE Colleges (Figure 30). In 2018/19, 82% of the learners on green skilled classified courses in this area were enrolled at GFE Colleges while just 14% were studying with Private Training Providers. By 2019/20 however, 36% of the learners were enrolled with Private Training Providers and 61% at GFE Colleges.

Figure 30: AEB Learners - Transport and Logistics Category by Provider Type 2019/20

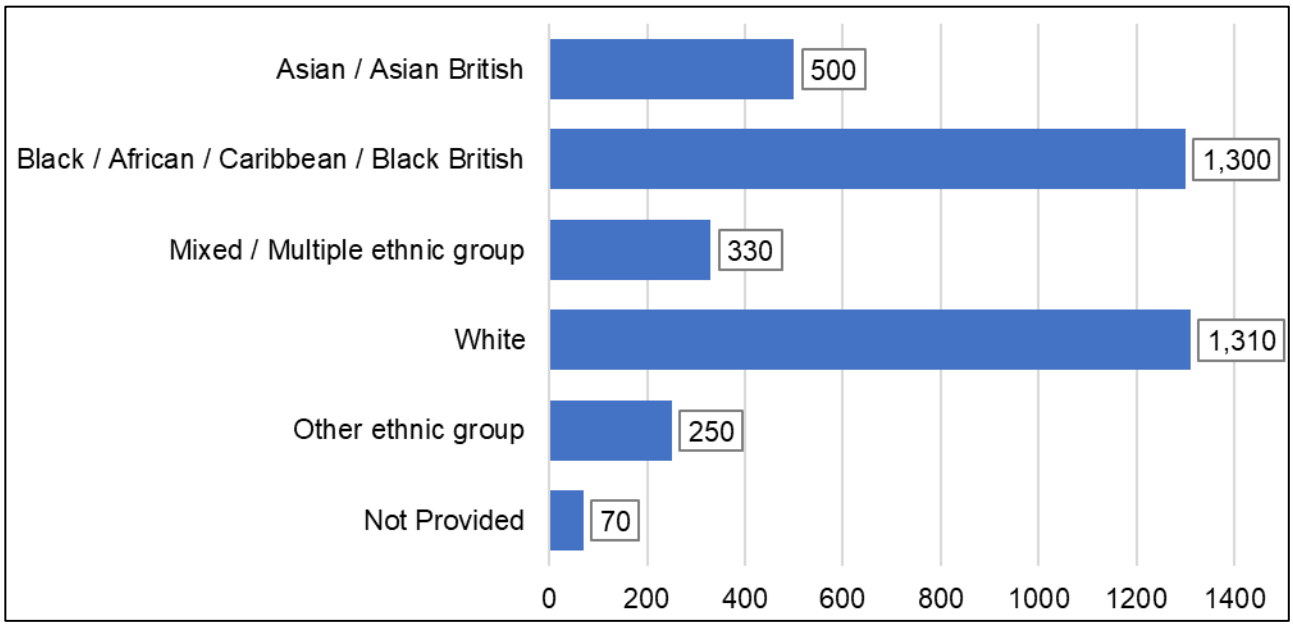
Provider Type	**2018/19**	**2019/20**	**2020/21**
Colleges	2,820	2,300	2,510
Other Public Funded – Las	90	110	0
Private Training Providers	510	1,350	1,000

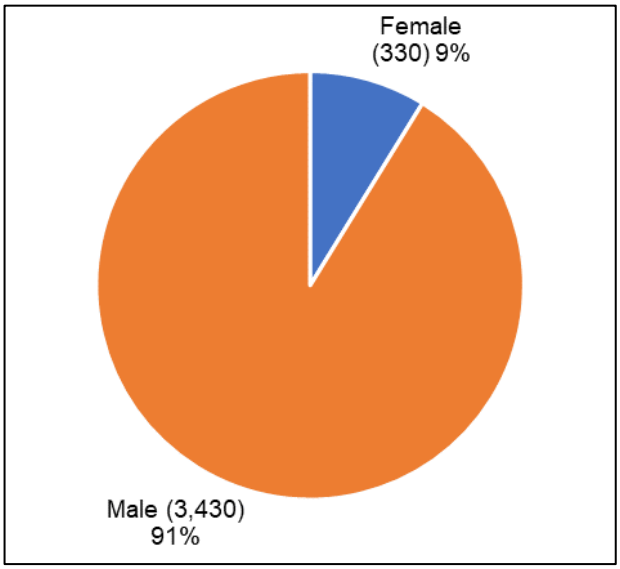


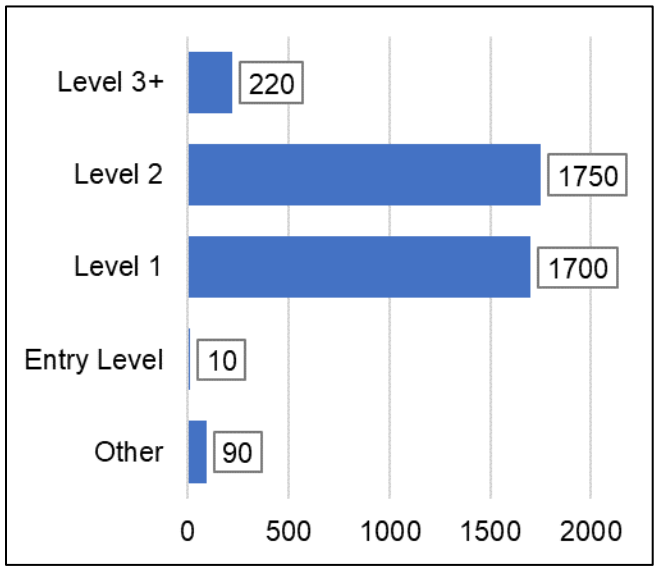
Learners enrolled on courses in this sector are predominantly male (91%) and come from a relatively diverse mix of ethnic backgrounds (Figure 31). In 2019/20, residents of Black / African / Caribbean / Black British ethnic background accounted for around 35%, White accounted for 35% and Asian / Asian British accounted for 13%. The remainder was made up from learners with mixed or other ethnic backgrounds.

The majority of AEB funded learners in the Transport and Logistics sector are enrolled on qualifications at Level 1 and Level 2. In 2019/20, around 1,700 learners were enrolled on courses at Level 1, around 1,750 were enrolled at Level 2 and 220 were enrolled at Level 3.

Figure 31: AEB Learners Transport & Logistics by Ethnic Group, Sex and Highest Qualification Level 2019/20







Learners enrolled in this sector are more likely to live in areas of higher deprivation, with 28% of residents coming from the most deprived areas (IMD, Quintile 1) and a further 41% living in Quintile 2 (Figure 32)

A high proportion of learners lived in Lambeth, Croydon, Newham, Enfield and Brent (Figure 33). Very few learners lived in Boroughs to the South West of London, such as Richmond and Kingston.

Figure 32: AEB Learners Transport & Logistics by Deprivation Band 2019/20

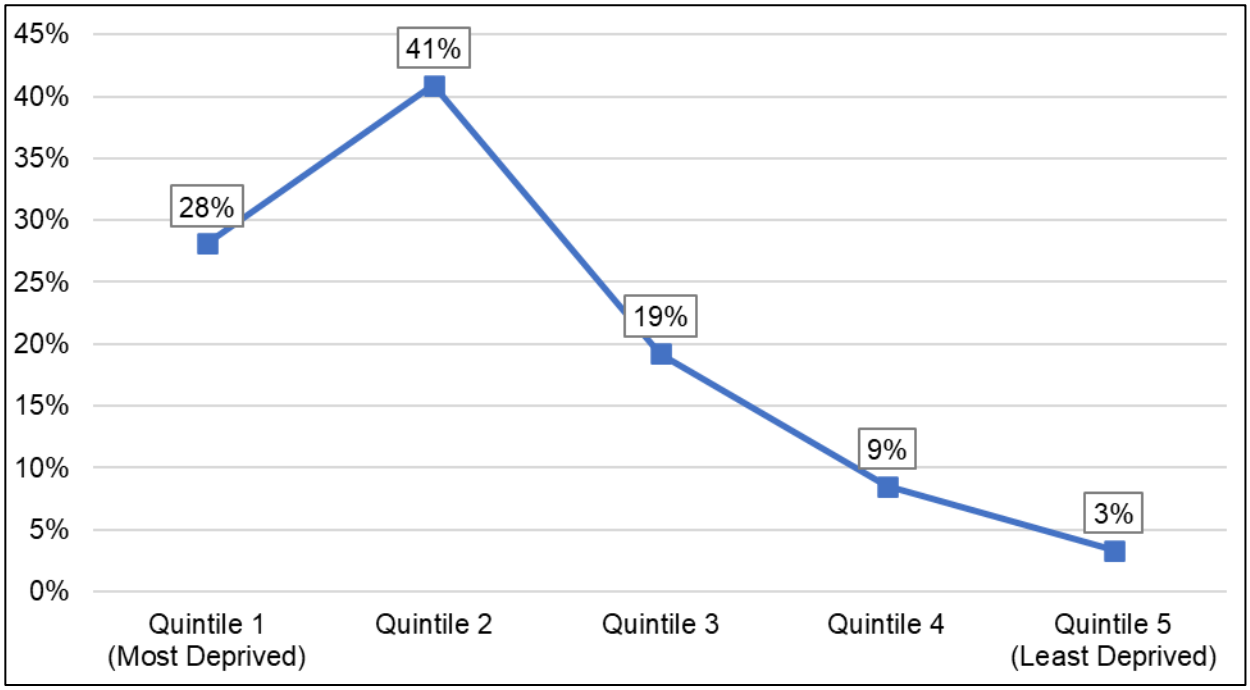
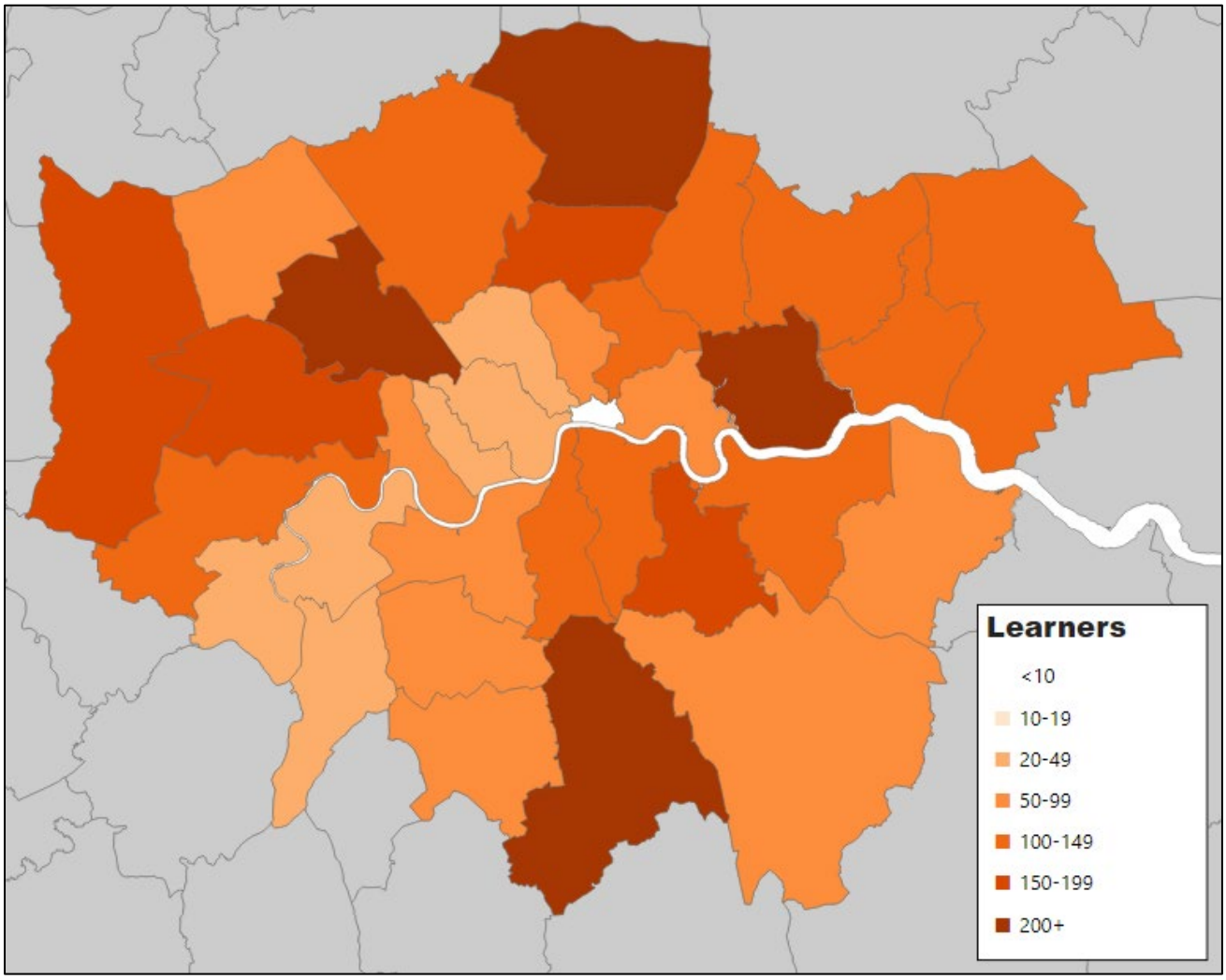


Figure 33: AEB Learners Transport & Logistics by London Borough 2019/20

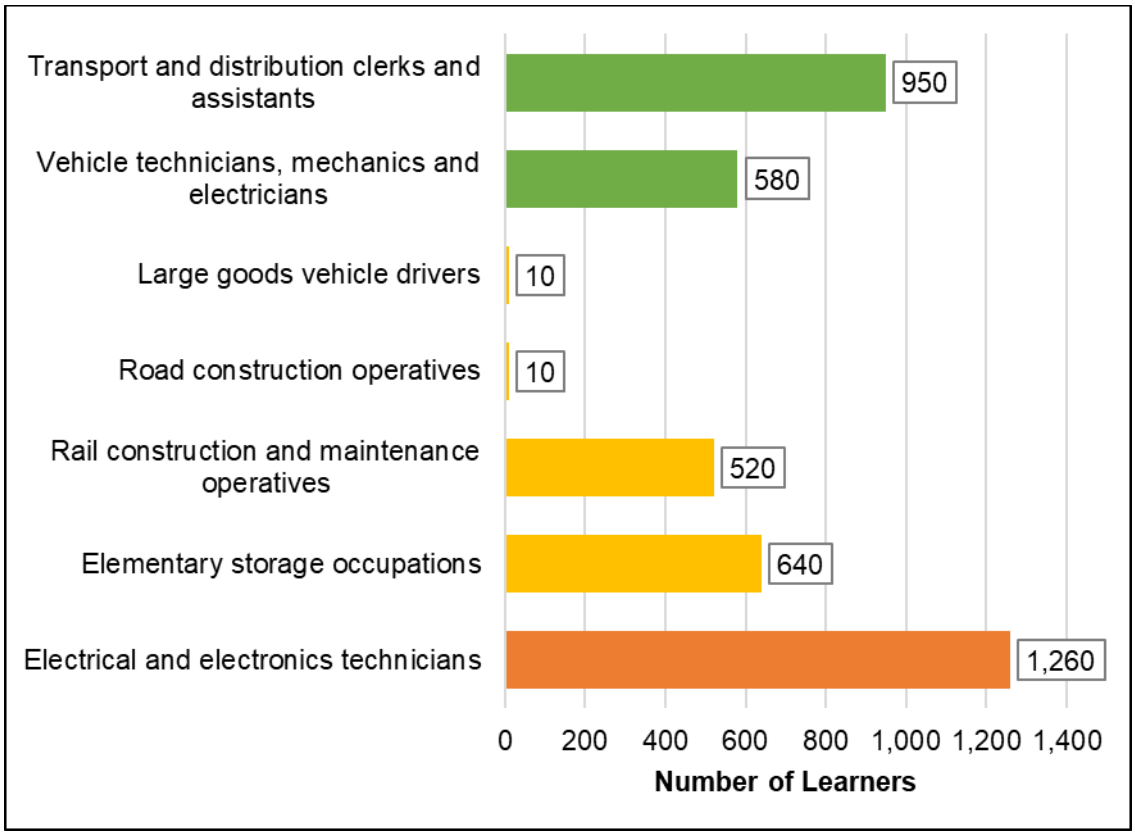


3.5 DETAILS OF CURRENT PROVISION BY OCCUPATION

Figure 34 shows the 2019/20 AEB learner numbers in a range of green occupations (SOC10) identified by GLA Economics (Figure 2). Only those occupations that had 10 or more enrolments are shown. The yellow bars in the chart indicate occupations that will require additional enhanced skills to meet the needs of a net zero economy. The green bars show occupations where there is likely to be increased demand, but the skills required will not change significantly from those currently in place. The orange bars show where there are likely to be new and emerging skills.

The majority of AEB provision in the Transport and Logistics sector, relevant to the green agenda, focusses on electrical and electronic occupations. This includes supporting the transition to electric vehicles (e.g. installation of EV charger points). The second largest occupational area is transport and distribution clerks and assistants. There is also a relatively large amount of provision supporting elementary storage occupations, vehicle technicians and rail construction and maintenance operatives.

Figure 34: AEB Learners – Transport and Logistics Learners by Occupation 2019/20



Details of AEB funded courses and associated learner numbers for each of these occupational areas, are discussed below. For information we have also included tables on relevant Apprenticeship Standards.

Transport and distribution clerks and assistants (Green Enhanced Skills)

Within this occupational area there is only one AEB funded qualification which attracted any significant number of learners in 2019/20 which was the Diploma in Supply Chain and Logistics. This is a Level 1 qualification which covers the fundamentals of collection, storage, safe handling, and distribution of goods. The course does cover some basic elements of sustainability, providing an understanding of the impact of waste on the environment and ways to minimise the environmental impact of recycling operations. There may be potential to go further however by including additional 'green' learning outcomes within the unit focussed on effective route planning for the collection and delivery of goods.

Although numbers on apprenticeships within related programmes are low, the most popular standards include the Level 3 Transport Planning Technician and the Level 3 Supply Chain Practitioner (Fast Moving Consumer Goods). Both standards include reference to the awareness of environmental sustainability, and how this can be influenced by transport and travel planning or by manufacturing practices.

Figure 35: AEB Funded Enrolments Transport and distribution clerks and assistants (Green Enhanced Skills)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Supply Chain and Logistics	Level 1	Medium	0	930	500
Non regulated SFA formula funded provision, Level 1, Warehousing and Distribution, 93 to 100 hrs, PW A	Level 1	Medium	50	0	0
Non regulated Community Learning provision, Warehousing and Distribution	Other	Unknown	10	10	0
Certificate in Supply Chain and Logistics	Level 1	Medium	0	10	0

Figure 36: Apprenticeship Standards Starts Transport and distribution clerks and assistants

Apprenticeship Standard Title	Level	20/21
Transport Planning Technician	Level 3	13
Supply Chain Practitioner (Fast Moving Consumer Good)	Level 3	13
Supply Chain Leadership Professional (Integrated Degree)	Level 6	3
Transport Planner (Integrated Degree)	Level 6	3
Supply Chain Operator	Level 2	2

Vehicle technicians, mechanics and electricians (Green Enhanced Skills)

The majority of learners on courses which support this occupation are enrolled on non-regulated provision. These are a mixture of short and medium length courses at Levels 1 and 2. There are also a small number of learners enrolled on the Level 1 Diploma in Transport Maintenance and the Level 2 and Level 3 Diplomas in Light Vehicle Maintenance and Repair Principles (VRQ) qualifications. Other than some general, non-technical knowledge on the hazards surrounding Electric Vehicles to avoid potential harm, there is little information publicly available to evidence the delivery of Green skills within the units of these qualifications.

Figure 37: AEB Funded Enrolments Vehicle technicians, mechanics and electricians (Green Enhanced Skills)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Non regulated SFA formula funded provision, Level 2, Transportation Operations and Maintenance, 197 to 292 hrs, PW C	Level 2	Medium	160	110	0
Non regulated SFA formula funded provision, Level 1, Transportation Operations and Maintenance, 69 to 92 hrs, PW C	Level 1	Short	0	160	80
Diploma in Transport Maintenance	Level 1	Medium	60	70	70
Non regulated Community Learning provision, Transportation Operations and Maintenance	Other	Unknown	80	110	0
Non regulated SFA formula funded provision, Level 2, Transportation Operations and Maintenance, 101 to 196 hrs, PW C	Level 2	Medium	0	130	30
Diploma in Light Vehicle Maintenance and Repair Principles (VRQ)	Level 3	Long	30	40	60
Diploma in Light Vehicle Maintenance and Repair Principles (VRQ)	Level 2	Long	30	10	70
Certificate in Transport Maintenance	Level 1	Medium	30	20	30
Award in Transport Maintenance	Level 1	Short	40	20	20
Diploma in Light Vehicle Maintenance and Repair Principles	Level 2	Long	40	10	30
Diploma in Light Vehicle Maintenance and Repair Principles	Level 3	Long	30	10	20
Subsidiary Diploma in Light Vehicle Maintenance and Repair Technology (VRQ)	Level 2	Medium	20	10	20
Diploma in Vehicle Systems Maintenance	Level 1	Medium	10	20	20
Certificate in Cycle Mechanics	Level 2	Medium	20	20	0

Apprenticeships have a higher take up than AEB funded qualifications in this sector with the Level 3 Motor Vehicle Service and Maintenance Technician (Light Vehicle) standard attracting a little under 400 apprentices and the Level 2 Autocare Technician attracting almost 150 apprentices. Both of these standards currently contain little in the way of specific green skills training beyond delivering a non-technical understanding in safe working procedures when working with hybrid and electric vehicles.

Figure 38: Apprenticeship Standards Starts Transport and distribution clerks and assistants

Apprenticeship Standard Title	**Level**	**20/21**
Motor Vehicle Service and Maintenance Technician (Light Vehicle)	Level 3	388
Autocare Technician	Level 2	145
Bus and Coach Engineering Technician	Level 3	106
Heavy Vehicle Service and Maintenance Technician	Level 3	86
Vehicle Damage Mechanical, Electrical and Trim (MET) Technician	Level 3	5

Figure 39: Advanced Learner Loan Enrolments Vehicle technicians, mechanics and electricians

Learning Aim Title	**Level**	**Size**	**18/19**	**19/20**	**20/21**
Diploma in Light Vehicle Maintenance and Repair Principles (VRQ)	Level 3	Long	20	10	10
Diploma in Light Vehicle Maintenance and Repair Principles	Level 3	Long	10	10	10

Large goods vehicle drivers (Green Enhanced Skills)

During the past three years there has been very little take up on AEB funded courses within London which focus on large goods vehicle drivers.

Apprenticeships were the only route attracting any significant learner numbers in 2020/21 with almost 140 apprentices on the Level 2 Large Goods Vehicle (LGC) Driver standard. This standard provides drivers with an understanding of the environmental impact of the industry their role in how this can be minimised, including their own responsibilities to use safe and fuel-efficient driving techniques.

Figure 40: AEB Funded Enrolments Large goods vehicle drivers (Green Enhanced Skills)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Driving Goods Vehicles	Level 2	Medium	0	10	0

Figure 41: Apprenticeship Standards Starts Large goods vehicle drivers

Apprenticeship Standard Title	Level	20/21
Large Goods Vehicle (LGV) Driver	Level 2	139

Road construction operatives (Green Increased Demand)

There is little take up of AEB funded qualifications and Apprenticeships within this area.

Figure 42: AEB Funded Enrolments Road construction operatives (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Roadbuilding and Maintenance (Construction) - Manual Roadbuilding	Level 2	Medium	0	10	0

Figure 43: Apprenticeship Standards Starts Road construction operatives

Apprenticeship Standard Title	Level	20/21
Highways Maintenance Skilled Operative	Level 2	17

Rail construction and maintenance operatives (Green Increased Demand)

The Level 2 Certificate in Rail Engineering Underpinning Knowledge and the NVQ Diploma in Rail Engineering Track Maintenance are popular qualifications within this occupation, both of which attracted over 500 AEB funded learners in 2020/21. Demand for these qualifications has increased significantly in recent years.

The Level 2 Certificate in Rail Engineering Underpinning Knowledge is aimed at providing learners with sufficient knowledge, understanding and practical skills to introduce them to the industry and prepare them to undertake the NVQs in Rail Transport Engineering successfully. On completion of this qualification learners would be able to progress to an Advanced Apprenticeship in Rail Transport Engineering or look to take up a supervisor or team leader role such as a Leading Track Operative (Maintenance and Renewals).

Figure 44: AEB Funded Enrolments Rail construction and maintenance operatives (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Rail Engineering Underpinning Knowledge	Level 2	Medium	340	310	570
NVQ Diploma in Rail Engineering Track Maintenance	Level 2	Medium	290	200	560
NVQ Diploma in Rail Engineering Track Maintenance	Level 2	Medium	160	170	70
Certificate in Skills for Track and Rail Site Maintenance (RQF)	Level 2	Medium	40	170	80
Certificate in Railway Engineering Track Renewals	Level 2	Medium	10	0	0
NVQ Certificate in Rail Engineering Track Renewals	Level 1	Medium	10	0	0
Certificate in Skills for Track and Rail Site Maintenance (RQF)	Level 1	Medium	0	0	0

There are a range of apprenticeship standards linked to this occupation, with opportunity for progression from qualifications at Level 2 all the way up to Level 7. The Level 3 Rail Engineering Technician attracted more apprentices in 2020/21 than any of the other standards available.

In this role, Rail Engineering Technicians are expected to provide technical support to engineers working on the rail network and trains. This role includes electrification skills which is an important element of working to a more sustainable transport infrastructure.

Figure 45: Apprenticeship Standards Starts Rail construction and maintenance operatives

Apprenticeship Standard Title	Level	20/21
Rail Engineering Technician	Level 3	157
Rail Engineering Operative	Level 2	69
Rail and Rail Systems Principal Engineer (Integrated Degree)	Level 7	11
Rail Infrastructure Operator	Level 2	11
High Speed Rail and Infrastructure Technician	Level 4	9
Railway Engineering Design Technician	Level 3	3
Rail Engineering Advanced Technician	Level 4	3

Figure 46: Advanced Learner Loan Enrolments Rail construction and maintenance operatives

Learning Aim Title	Level	Size	18/19	19/20	20/21
NVQ Diploma in Rail Engineering Track Maintenance	Level 3	Medium	10	10	10

Elementary storage occupations (Green Increased Demand)

There are a number of AEB funded courses available for London residents working within elementary storage occupations. The table below shows a list of Level 1 and Level 2 Warehousing and Storage qualifications available to residents in recent years and the annual number of leaners enrolled on each course.

Figure 47: AEB Funded Enrolments Elementary storage occupations (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Warehousing and Storage	Level 1	Medium	560	410	220
Certificate in the Principles of Warehousing and Storage	Level 2	Short	130	80	150
BTEC Certificate in Warehousing and Storage Principles	Level 2	Medium	10	40	150
Certificate in Warehousing and Storage Principles (RQF)	Level 2	Medium	130	50	0
Certificate in Warehousing and Storage (RQF)	Level 2	Medium	0	30	20
Certificate in Warehousing and Storage	Level 2	Medium	10	30	0
Certificate in Warehousing and Storage Principles	Level 2	Medium	0	20	0
Certificate in an Introduction to Warehousing (RQF)	Level 1	Short	0	0	20

In 2020/21 there was one apprenticeship standard available linked to this occupation which attracted around 100 apprentices in London. The Supply Chain Warehouse Operative standard is a Level 2 work-based qualification aimed at learners who are working, or want to work, in distributive operations, such as dealing with the handling and storing of goods within a commercial, industrial or remover's warehouse or freight facility. The standard includes knowledge of the environmental factors linked to safety and security of hazardous good and materials.

Figure 48: Apprenticeship Standards Starts Elementary storage occupations

Apprenticeship Standard Title	Level	20/21
Supply Chain Warehouse Operative	Level 2	100

Electrical and electronics technicians (Green New & Emerging)

Electrical and electronic technicians are likely to be in increased demand across the transport sector as we transition to electric vehicles and smart transport networks. This will include activities such as the installation of EV charging points, servicing and maintaining electric cars, buses and transport vehicles and supporting smart technology on roads and railways. These qualifications are also required in the Building and Construction sector (see Part Two).

Figure 49: AEB Funded Enrolments Electrical and electronics technicians

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Electrical Installations	Level 2	Large	990	910	1,010
Diploma in Electrical Installation	Level 1	Medium	160	170	220
Diploma in Electrical Installations	Level 3	Large	140	160	50
Advanced Technical Diploma in Electrical Installation (450)	Level 3	Large	0	0	190

Figure 50: Apprenticeship Standards Starts Electrical and electronics technicians

Apprenticeship Standard Title	Level	20/21
Installation electrician and maintenance electrician	Level 3	801
Electrical, electronic product service and installation engineer	Level 3	2

Figure 51: Advanced Learner Loan Enrolments Electrical and electronics technicians

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Electrical Installations (Buildings and Structures)	Level 3	Long	280	270	90
Diploma in Electrical Installation	Level 3	Long	300	60	0
NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	Level 3	Long	40	30	30
Advanced Technical Diploma in Electrical Installation (450)	Level 3	Long	0	0	60

3.6 POTENTIAL LEVEL 4/5 PROGRESSION ROUTES

The opportunity for progression to higher level qualifications (Levels 4 and 5) appears very limited within this sector with only a single, non-regulated Level 4 qualification in Transport Operations and Maintenance available to London residents which attracted around 20 adult learners in 2019/20.

Figure 52: Level 4/5 Courses

Qualification	Level	19/20
Non regulated provision, Level 4, Transportation Operations and Maintenance	Level 4	20

Source ILR 2019/20 (Data Cube) & HESA 2019/20

PART FOUR: ENVIRONMENT, CONSERVATION AND AGRICULTURE

4.1 INTRODUCTION

This section of the report focuses on green skills issues in the Environment, Conservation and Agriculture sector and includes data on AEB funded courses, apprenticeships and FE loans. Historically, skills provision in this sector is relatively small in London due to the urban setting of the capital but green space and access to parks is considered vital for the health and well-being of London residents. There are links to the construction sector in terms of urban landscaping and also to the energy sector in terms of using trees to consume carbon dioxide and emit oxygen. This section of the report also includes findings from fieldwork interviews with providers (including London Boroughs), employer representative groups and employers in the Environment, Conservation and Agriculture sector.

Background Context

The London Environment Strategy[16] launched by the Mayor of London in May 2018 is in his words "the first truly integrated environment strategy for London that will combine policy and action to deliver multiple benefits for Londoners".

The report makes clear that green space is a problem in the capital, increasingly development is encroaching on open space and more gardens have been paved over. It states that almost half of London residents have poor access to parks. It also states that due to reduced funding to local authorities less money has been spent on the maintenance of parks and the quality of parks has declined in some parts of the capital. It also states that as green space has been lost it has resulted in a reduction in the range of plants and animals that live within Greater London.

Associated with the loss of green space plus the expansion of impermeable surfaces alongside an outdated drainage system leaves London increasingly vulnerable to flooding. As climate change brings a rise in sea levels and increased rainfall the threat of flooding is intensifying. The report emphasises that London's water supply is also under pressure and by 2040 there will be 400 million litres of water less than is needed to keep supplies flowing.

At the time the report was published less than half of the 7 million tonnes of waste produced in Greater London was recycled and landfill capacity is forecast to run out by 2026. Therefore, London needs to reduce, reuse and recycle more and for residents and businesses to regard waste as a valuable resource and to work collectively to reduce waste bills.

The London Environment Strategy contains the following strategic aims:

- For London to be the world's first National Park City where more than half of its area is green, where the natural area is protected and where the network of green infrastructure is managed to benefit all Londoners.

[16] Mayor of London (2018) *London Environment Strategy*

- To make London a zero-waste city and by 2026 no biodegradable or recyclable waste will be sent to landfill and by 2030 65% of London's municipal waste will be recycled.
- For London and Londoners to be resilient to severe weather and long-term climate change impacts. This will include flooding, heat risk and drought.

In September 2021 the Mayor of London published a progress report on the strategy. The report stated that since 2017, the Mayor's £13m Greener City Fund has supported green space projects in all 32 boroughs and the City of London, improving or creating over 400 hectares of green space. This includes over 180 community green space projects, and 6 major capital projects. These capital projects provide exemplars of how to create and link green spaces, maximising the benefits for people and wildlife.

The Mayor's London Plan has proposed increased protection of the green belt, open land in metropolitan areas, public open spaces and nature conservation sites. The London Plan will also introduce a new planning tool that will ensure all new developments include urban greening such as green roofs, planting of trees and sustainable urban drainage. The Mayor has established the London Green Space Commission which will support boroughs in developing new models for financing their parks services.

On a national scale, post-Brexit, the United Kingdom now has the opportunity to determine its own domestic agricultural and conservation policy. The Department for Environment, Farming and Rural Affairs (DEFRA) has broadly defined its approach to supporting the sector post Brexit as 'using public money for public good'. It will gradually move away from the farm subsidy programme that was in place under the CAP system and will support the wider land based and conservation sector. DEFRA recognises that the land-based and conservation sector is crucial in the nations enhancement and the protection of its environment. DEFRA is likely to support activities that improve soil health, water quality, air quality, increase biodiversity, mitigate climate change, and enhance the beauty, heritage and engagement with the natural environment.

In 2020 the National Farmers Union (NFU) produced its report The Future of Food 2040 which identified that food producers in both rural and urban settings will need good business acumen and commercial insight, to be digitally literate and to make enhanced use of data. Data analysis can make the sector transformative through the use of smarter applications, tools and services which provide real time management, market intelligence and monitoring. This will help to improve the productivity of land-based and conservation businesses and make smarter use of resources including energy and water.

The Royal Horticultural Society (RHS) produced its report Horticulture Matters to address the increasing skills issues in the sector and laid out how the industry should tackle the situation. It stated that 72% of horticultural businesses were unable to fill skilled vacancies; 70% of 18 year olds believed horticultural careers should only be considered by people who have 'failed academically' and 50% of under 25s think horticulture is an unskilled career.

GLA Economics has identified a number of occupations that are related to the Environment, Conservation and Agriculture sector that are likely to face skills issues as we move towards a net zero economy. Some of these occupations will require new or enhanced skills. These include farmers for which there will be a very low demand for skills training for residents of Greater London and refuse and salvage occupations which as data in section 4.5 indicates there is currently little training provision taking place. Others may require greater numbers of trained individuals to meet growing demand (e.g. Horticultural trades).

Figure 53: Green Occupations in Environment, Conservation and Agriculture

SOC10	Occupation	Green Occupation Type
5111	Farmers	Green Enhanced Skills
5112	Horticulture trades	Green Increased Demand
5119	Agricultural and Fishing Trades n.e.c.	Green Increased Demand
9112	Forestry workers	Green Increased Demand
3550	Conservation & environmental associate professional	Green Increased Demand
5113	Gardeners and landscape gardeners	Green Increased Demand
9235	Refuse and salvage occupations	Green New and Emerging

4.2 RESEARCH FINDINGS: FIELDWORK

Summarised below are key issues emerging from interviews with providers, London Boroughs, employers and employer bodies. A full list of interview respondents is given in Annex B.

Employer Views

1. Companies of all sizes are reporting difficulties in recruiting young people and therefore if the GLA has control of the AEB budget it could incentivise payment of fees for adults seeking a new career in this sector, particularly adults who have lost their previous job in the hospitality or travel industry and are seeking an alternative career.
2. Pest and disease control will become a high priority as biosecurity is ever more important.
3. Water conservation and flood alleviation skills will become a high priority as the climate continues to change.
4. The growth in the workforce is being hampered because there are severe skills gaps at the supervisory level. There are still 'unskilled' labourers around but recruiting supervisors to manage the labourers is proving very difficult. Supervisory roles in other sectors, particularly construction tend to offer much higher wages.
5. During the COVID-19 lockdown people have decided to invest in their gardens rather than go on holiday. This has created a boom for the landscaping and gardening sector and companies are reporting they could easily expand the size of their workforce by around 25% in order to meet demand. In some parts of the country there is now an 18-month waiting list to have a garden redesigned and landscaped.
6. The Green Skills agenda hasn't, as yet made any difference to how most landscaping businesses operate. It is recognised that how a green space is landscaped can be beneficial to the environment such as water conservation, flood avoidance etc. whereas some can have a negative impact such as the laying of artificial turf.
7. The demand for more environmentally friendly and sustainable landscaping is more likely to come from a client than a landscaper. Some clients with large budgets will want a greenspace that

contributes to the green environment through its design, the reuse of water, composting, the hard landscaping materials that are used etc and landscapers will just react to what the client needs.

8. Very few landscape businesses quoting for a project would propose a scheme that has the preservation of the environment at the forefront of their design because this would inevitably make their proposal more costly than those who offer more traditional approaches.
9. Businesses will have to become more skilled in how they source their materials, focussing on plants grown in the UK, biosecurity and materials that are made from a sustainable source.
10. Some industry bodies stated that within land-based colleges teaching staff have not kept up to pace with changes in the industry and therefore they are unable to offer and teach courses in subjects such as green roof installation.

Provider Views

1. Many land-based providers do not use the term green skills and prefer to use the term 'environmental skills' because it also covers blue skills (water conservation & flood protection) and grey skills (recycling).
2. Providers are being innovative and have developed new courses such as producing fresh food in an urban environment and in the monitoring of water and air quality.
3. A growing proportion of 16-18 year old learners are very interested in climate change and environmental conservation. These learners want and expect the subject to be embedded within their course. They are also pushing their provider to provide more specific courses linked to climate change. The younger students also expect the provider to consider climate change and environmental conservation in all its activities.
4. An increasing number of employers are approaching providers that are seeking help in upskilling staff with knowledge in water conservation, tree planting and land management but often there are no 'off the shelf' courses that meet their needs, so providers devise packages of bespoke provision at full cost. The cost of the course sometimes deters some employers to go ahead with the upskilling of staff.
5. The providers are in discussion with awarding organisations on the development of new environment and conservation courses that address the London Environment Strategy. However, the process is time consuming and by the time the course content has been put together and approved it is often out of date as the technology has moved on.
6. The 10% flexibility of the AEB allocation allowed by the GLA does enable providers to offer small bite size courses for adults in developing green spaces, managing an allotment etc.
7. Landscapers will need to be skilled in working alongside the construction industry in the installation of green roofs.
8. Apprenticeships are available for adults but many adults think apprenticeships are for school leavers only.

4.3 RESEARCH FINDINGS: DATA ANALYSIS

Sections 4.4 and 4.5 provide a detailed analysis of learner data in the Environment, Conservation and Agriculture sector, primarily focusing on courses funded through the Adult Education Budget as well as a brief overview of apprenticeships and loan funded courses. Summarised below are key findings from the data analysis.

Summarised below are key finding from the data analysis.

1. In 2019/20 there were 1,850 learners in Greater London taking specific Environmental, Conservation and Agriculture AEB related courses associated with green occupations (identified by GLA Economics). However, there has been a 39% decline in learner volumes between 2018/19 and 2019/20. This reflects the views expressed by employers in the sector that attracting entrants is extremely difficult due to higher wage rates in the construction sector in particular.
2. The vast majority of AEB provision in the Environment, Conservation and Agriculture sector, relevant to the green agenda, is focused on Horticultural Trades. This is followed by Conservation & Environmental Associate Professional occupation and Gardeners & Landscapers.
3. The FE College sector dominates the delivery of provision in this sector. In 2019/20 the FE Colleges attracted 55% of all AEB learners. However, learner volumes within FE Colleges declined by 42% between 2018/19 and 2019/20.
4. Although the FE College sector is the prominent provider of learning for the Environment, Conservation and Agriculture sector the Other Public Funded providers also attracted 39% of all AEB learners in this sector in 2018/19. Despite the number of learners recruited by Other Public Funded providers declining by 34% over the two year period between 2018/19 and 2019/20 it collectively managed to increase its market presence to 43% in 2019/20.
5. In general, the land based and green spaces sector in England attracts a majority of male learners. However, in 2019/20 68% of AEB learners from Greater London were female. This may have some reflection on some of the largest areas of provision within Horticulture and Environmental Sustainability which are less male dominated than provision related to farming, arboriculture and agricultural engineering which tend to attract a greater proportion of male learners.
6. The profile of learners by level of study may indicate that there are progression issues within this area of provision. 890 of learners are studying at Level 2, however 200 of AEB learners were studying at Level 1 and there were only around 10 learners studying at Level 3. The lack of learners at Level 3 compared to Level 2 reflects the concerns of employers that there were very few learners in the sector with the level of skills that enabled them to become team supervisors and managers.
7. Over two thirds of the learners engaged in this sector were classed as white while just over one tenth were Asian/Asian British and less than one tenth were Black/African/Caribbean/Black British.
8. The recruitment of Environmental, Conservation and Agriculture is quite polarised in terms of the levels of deprivations in which they live. Equal proportions of learners lived in the most deprived areas and also in the most prosperous areas of Greater London.
9. Arboriculture is the only subject area within Environmental, Conservation and Agriculture with courses at Level 4 and 5 but these only attract around 20 London learners.

4.4 OVERVIEW OF CURRENT ADULT SKILLS PROVISION

The data in this section focuses on learners who have a Greater London postcode. Three years of data (2018/19, 2019/20 and 2020/21) are included but the data from the 2020/21 is only for part of the year (up to February 2021) so cannot be directly compared with data from previous years. Also, recruitment in 2020/21 will have been severely affected by Covid-19, so learner numbers in this year may not be a good indicator of long-term trends. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 54 shows that in 2019/20 there were 1,850 learners in Greater London taking specific Environmental, Conservation and Agriculture AEB related courses associated with green occupations (identified by GLA Economics). This was a 39% decline in learner numbers compared to the previous year and reflects the views expressed during the fieldwork stage that demand for learning in this sector has declined rapidly in recent years.

Figure 54 AEB Learners – Environment, Conservation and Agriculture Green Skills Category

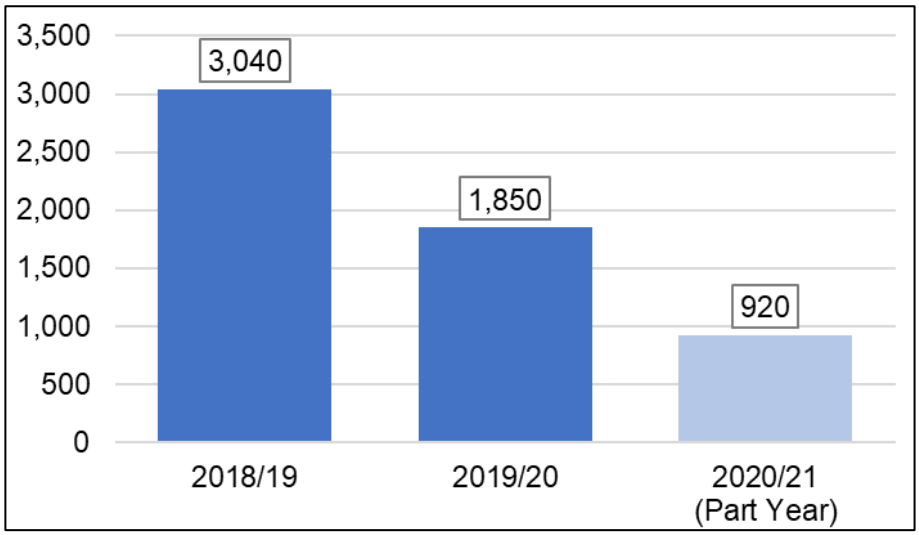


Figure 55: Enrolments and Learners – Agriculture, Horticulture, Environmental and Conservation Category

Year	Enrolment	Learners
2018/19	4,330	3,040
2019/20	2,400	1,850
2020/21 (Part Year)	1,040	920

Figure 56 below shows how the FE College sector dominates the delivery of provision in this sector. In 2019/20 the FE Colleges attracted 55% of all AEB learners. However, learner volumes within FE Colleges declined by 42% between 2018/19 and 2019/20.

Figure 56: AEB Learners Environment, Conservation and Agriculture Green Skills Category by Provider Type 2019/20

Provider Type	**2018/19**	**2019/20**	**2020/21**
Colleges	1,770	1,020	470
Other Public Funded - LAs	1,190	790	410
Private Training Providers	80	50	40

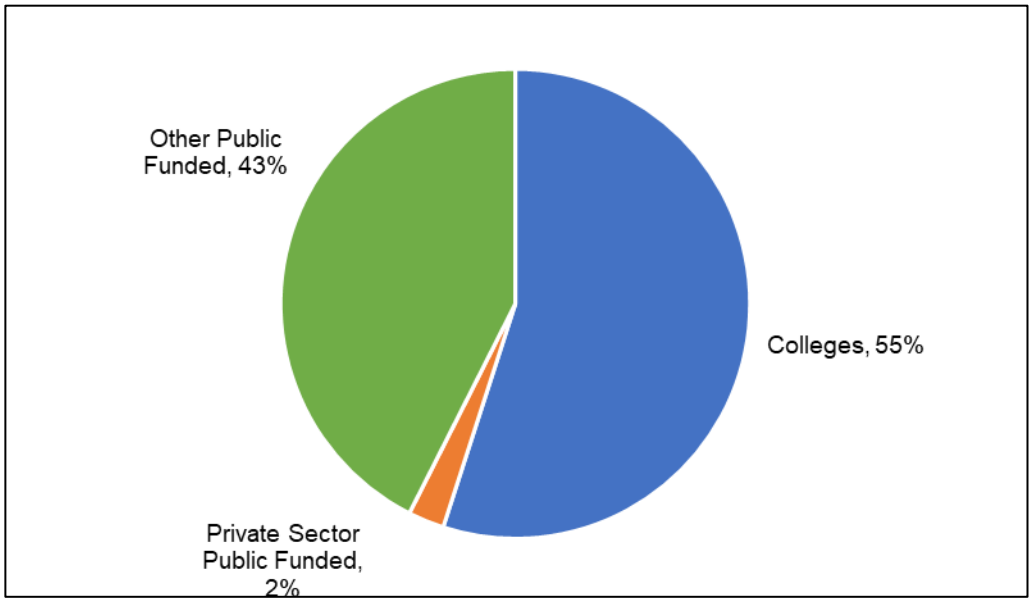


Figure 57 shows the breakdown of Environment, Conservation and Agriculture AEB learners on courses designated as green by ethnicity, sex and level of study in 2019/20. The majority of learners were female (68%) and a large number of learners were studying at Level 2 (890). This suggests that progression routes into and through the qualification levels could be an issue in this area of provision. It also demonstrates how very few of these learners will be progressing to higher technical education.

Approximately 70% of learners were White, 12% Asian/Asian British and 8% Black/African/Caribbean/Black British.

Figure 57: Environment, Conservation and Agriculture Green Skills Category AEB Learner Volumes by Ethnic Group, Gender and Highest Qualification Level being studied 2019/20

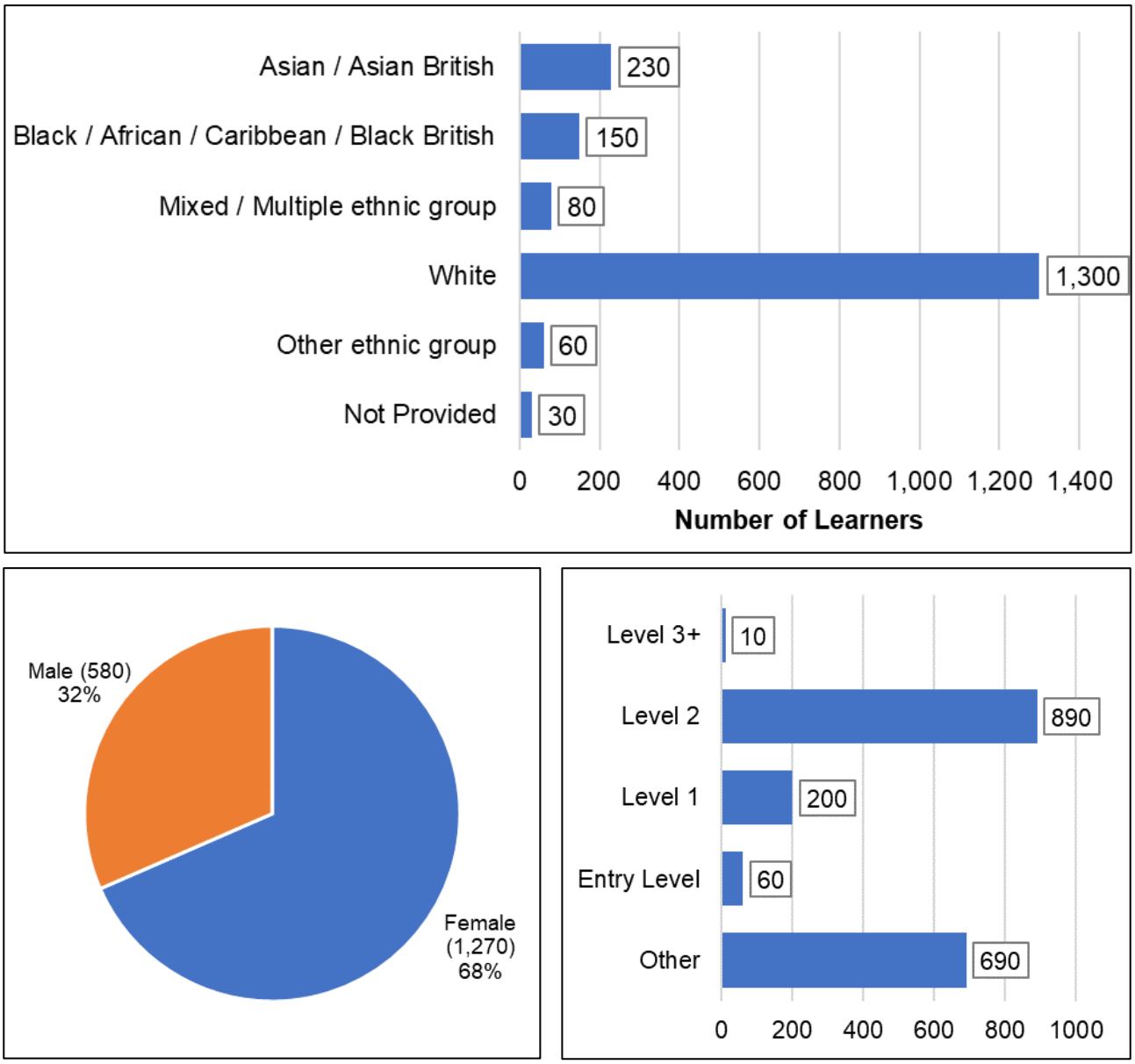
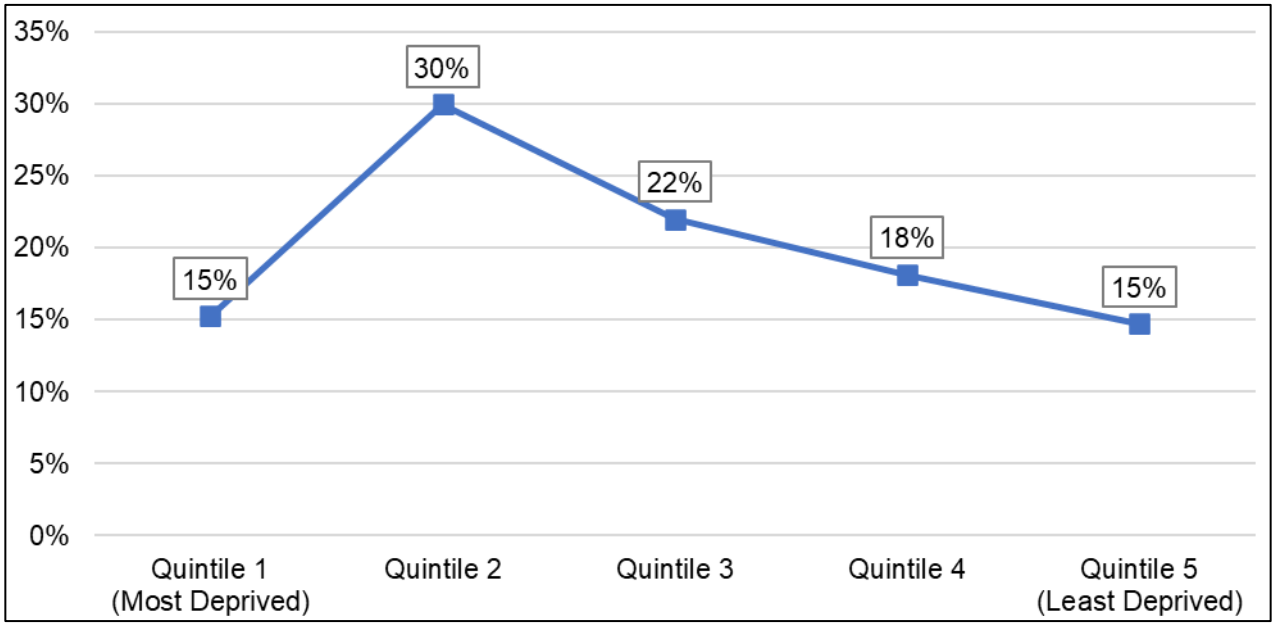


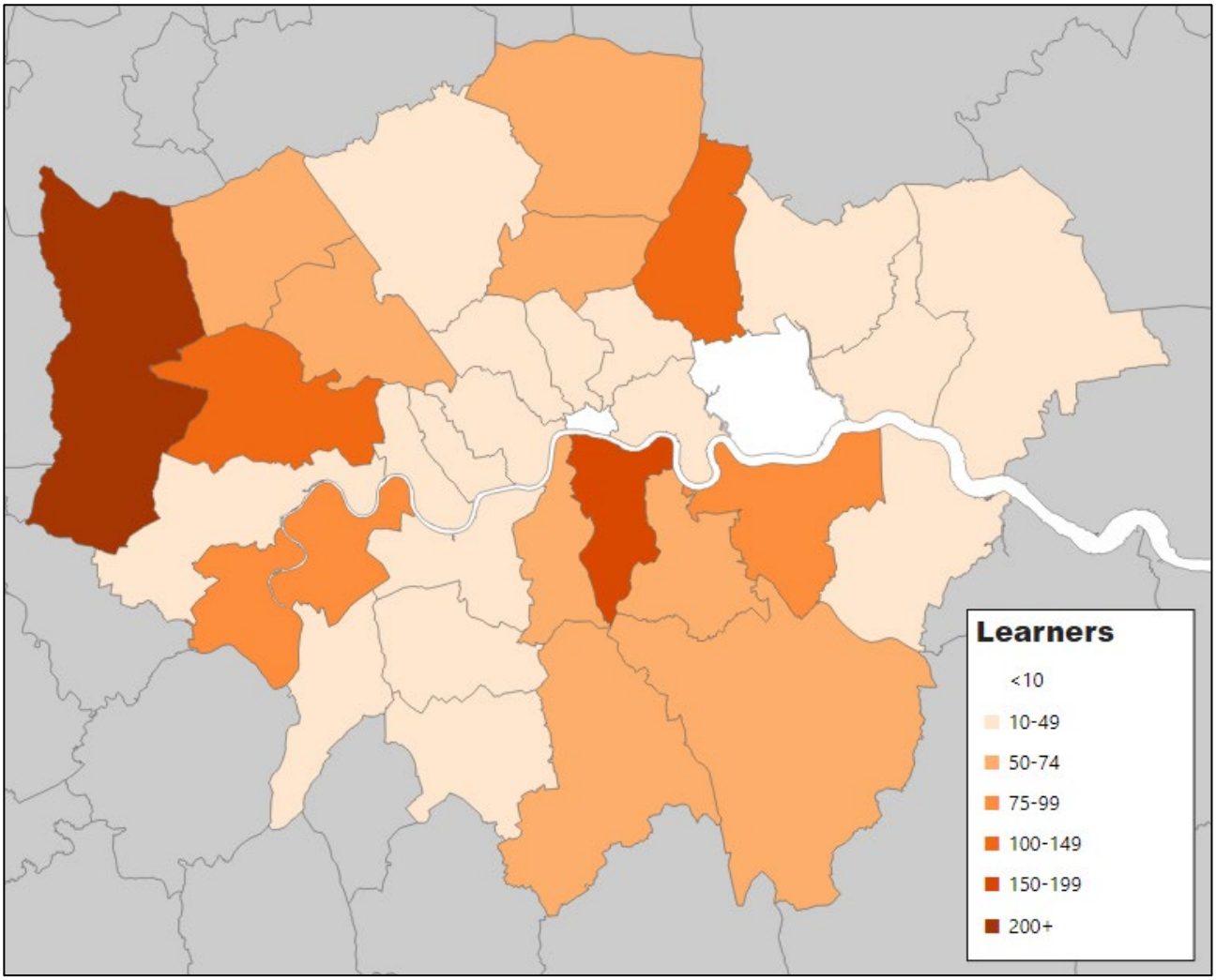
Figure 58 shows that 15% of the AEB learner volumes in this subject area lived in the most deprived quintile of London and equally 15% of AEB learners lived in the most affluent quintile areas of London. The largest proportion of learners lived in the second most deprived quintile areas of London.

Figure 58: Environment, Conservation and Agriculture Green Skills Category AEB Learner Volumes by Deprivation Quintile 2019/20



The Borough with the greatest number of Environment, Conservation and Agriculture AEB learners in 2019 was Hillingdon with over 200 students. This was followed by Southwark, Waltham Forest and Ealing. There were virtually no learners living in both Newham and City of London. Generally, there were very few learners living in Boroughs in both central London and South West London.

Figure 59: Environment, Conservation and Agriculture Green Skills AEB Learners by London Borough 2019/20

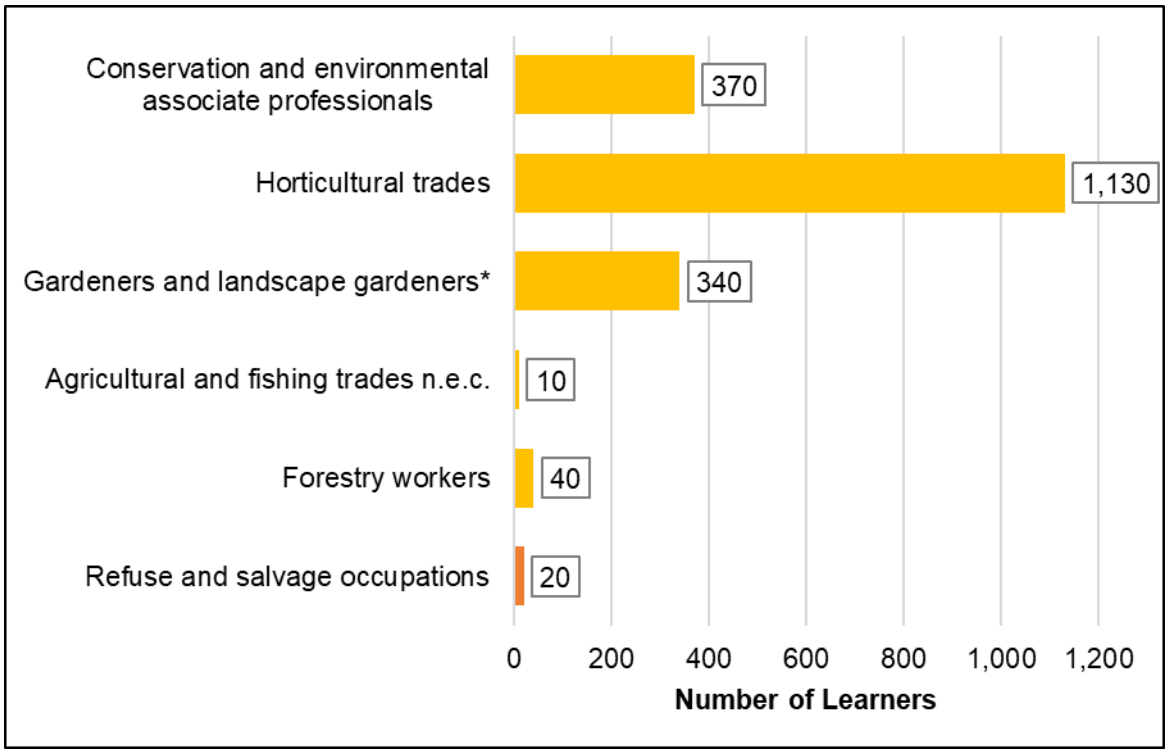


4.5 DETAILS OF CURRENT PROVISION BY OCCUPATION

Figure 60 shows the 2019/20 learner numbers in a range of green occupations (SOC10) identified by GLA Economics. Only those occupations that had 10 or more enrolments are displayed. A yellow bar in the chart indicates occupations that will require enhanced skills to meet the needs of a net zero economy and that includes all the occupations displayed in the chart.

The vast majority of AEB provision in the Environment, Conservation and Agriculture sector, relevant to the green agenda, is focused on Horticultural Trades. This is followed by Conservation & Environmental Associate Professional occupation and Gardeners & Landscapers. Each of these occupational areas provide important skills needed to achieve a net zero target by 2050. However, recruitment to Horticultural Trades is currently very difficult due to a lack of interest by young people and adults.

Figure 60: AEB Learners - Environment, Conservation and Agriculture Green Skills Category AEB Learner Volume 2019/20



Details of AEB funded courses and associated learner numbers for each of these occupational areas are discussed below. For information we have also included tables on relevant Apprenticeship Standards.

Conservation and environmental associate professionals (Green Increased Demand)

In 2019/20 there were just two courses that attracted over 100 GLA resident enrolments. Both courses were the Award in Environmental Sustainability at Levels 1 and 2. Each of these courses are classed as 'short' due to the qualification requiring less than 120 hours tuition. The Award in Preventing Plastic Pollution appears to be growing in popularity with 40 enrolments in 2019/20. Over the last three years there hasn't been any enrolments by GLA residents in the Level 2 Certificate in Sustainable Waste Management operative.

Figure 61: AEB Funded Enrolments Conservation and environmental associate professionals (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Award in Environmental Sustainability	Level 1	Short	940	300	20
Award in Environmental Sustainability	Level 2	Short	890	250	0
Non-regulated Community Learning provision, Environmental Conservation	Other	Unknown	80	50	20
Award in Preventing Plastic Pollution	Level 1	Short	0	40	30
Certificate in Practical Countryside Skills	Level 1	Medium	0	20	0
Award in Practical Countryside Skills	Level 1	Medium	10	0	0

Figure 62 shows there are Apprenticeship Standards related to Conservation and Environmental occupations but in 2020/21 they each attracted less than 10 GLA residents.

Figure 62: Apprenticeship Standards Starts Conservation and environmental associate professionals

Apprenticeship Standard Title	Level	20/21
Water Process Technician	Level 3	8
Environmental Practitioner (Degree)	Level 6	8
Water Environment Worker	Level 3	4

Figure 63: Advanced Learner Loan Enrolments Conservation and environmental associate professionals

Learning Aim Title	Level	Size	18/19	19/20	20/21
BTEC National Extended Certificate in Countryside Management	Level 3	Long	0	0	10

Refuse and salvage occupations (Green New & Emerging)

Although the Refuse and Salvage Occupation is being identified as a Green New & Emerging occupation there are very few GLA residents taking up the Level 2 qualification in the Diploma for Sustainable Recycling Activities with 20 enrolments in 2019/20 and none at the start of the 2020/21 academic year.

Figure 64: AEB Funded Enrolments Refuse and salvage occupations (Green New & Emerging)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma for Sustainable Recycling Activities	Level 2	Medium	0	20	0

Horticultural trades (Green Increased Demand)

GLA Economics research suggests that there will be an increased demand for jobs related to the horticulture sector in order to meet the net zero economy. However, the table below reflects evidence gathered from employers and employer groups in the sector that indicated a lack of interest in horticulture related courses by both young people and adults. The most popular course is linked to community learning and is focused on horticulture and forestry, but enrolments have reduced from 1,170 to 820 between 2018/19 and 2019/20. However, enrolments have been maintained in the Level 2 courses in Practical Horticulture and in the Level 1 course in Practical Horticulture. The lack of AEB courses at Level 3 and the very low numbers of people engaged on the Landscape and Horticulture Supervisor course reflects the concerns of employers with the lack of people interested in taking up a supervisory / team leader role within the horticulture industry.

Figure 65: AEB Funded Enrolments Horticultural trades (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Non regulated Community Learning provision, Horticulture and Forestry	Other	Unknown	1,170	820	360
Certificate in Practical Horticulture	Level 2	Medium	140	150	110
Certificate in Practical Horticulture Skills	Level 2	Medium	140	100	70
Certificate in Practical Horticulture Skills	Level 1	Medium	70	70	40
Award in Practical Horticulture Skills	Level 1	Short	140	0	10
Award in Work-Based Horticulture	Level 1	Medium	50	20	10
Non regulated SFA formula funded provision, Entry Level, Horticulture and Forestry, 21 to 44 hrs, PW E	Entry Level	Short	20	40	10
Award in Land-based Studies	Level 1	Short	50	0	10
Diploma in Work-based Horticulture	Level 2	Medium	20	30	20
Award in Work-based Horticulture	Level 2	Short	20	10	0

Certificate in Work-based Horticulture	Level 2	Medium	30	0	0
Non regulated SFA formula funded provision, Entry Level, Horticulture & Forestry, 101 to 196 hrs, PW E	Entry Level	Medium	20	0	10
Non regulated SFA formula funded provision, Entry Level, Horticulture and Forestry, 69 to 92 hrs, PW E	Entry Level	Short	10	10	10
Diploma in Land-based Studies	Level 1	Medium	10	10	10
Award in Horticulture	Level 1	Medium	0	20	10

Figure 66: Apprenticeship Standards Starts Horticultural trades

Apprenticeship Standard Title	**Level**	**20/21**
Horticulture or Landscape Operative	Level 2	136
Landscape or Horticulture Supervisor	Level 3	3

Figure 67: Advanced Learner Loan Enrolments Horticultural trades

Learning Aim Title	**Level**	**Size**	**18/19**	**19/20**	**20/21**
Advanced Technical Diploma in Horticulture	Level 3	Long	0	0	10

Gardeners and landscape gardeners (Green Increased Demand)

AEB learner volumes in courses related to gardening occupations which GLA Economics identified as having an increased demand in order to meet the net zero economy are relatively low, but enrolments remained at a constant level between 2018/19 and 2019/20. The Level 2 Certificate in the Principles of Plant Growth, Propagation & Development has a direct link for the need for the UK to be more self-sufficient in food production and to be able to produce more crops using less fertilizer in order to improve water quality due to less chemicals within water run-off from crop production.

Figure 68: AEB Funded Enrolments Gardeners and landscape gardeners (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in The Principles of Plant Growth, Propagation and Development	Level 2	Medium	150	160	100
Certificate in the Principles of Garden Planning, Establishment and Maintenance	Level 2	Medium	100	90	90
Certificate in Garden Design	Level 2	Medium	90	100	40
Award in the Safe Use of Brush-cutters and Trimmers	Level 2	Short	20	10	0

Figure 69: Apprenticeship Standards Gardeners and landscape gardeners

Apprenticeship Standard Title	Level	20/21
Horticulture or Landscape Operative	Level 2	136
Landscape or Horticulture Supervisor	Level 3	3

Figure 70: Advanced Learner Loan Enrolments Horticultural trades

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Plants and Planting Design	Level 3	Medium	10	20	10
Certificate in Principles and Practice of Garden Design	Level 3	Medium	10	10	10
Diploma in Garden Design	Level 3	Medium	10	0	0
Certificate in The Principles of Plant Growth, Health and Applied Propagation	Level 3	Medium	0	10	0

Agricultural and fishing trades n.e.c. (Green Increased Demand)

There are no GLA residents engaged in AEB provision related to agricultural and fishing trades.

Figure 71: AEB Funded Enrolments Agricultural and fishing trades n.e.c. (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Non regulated Community Learning provision, Agriculture	Other	Unknown	10	0	0
Diploma in Agriculture	Level 2	Medium	0	0	0

Forestry workers (Green Increased Demand)

There are very low AEB learners from London engaged in courses related to forestry. There are low numbers of learners engaged in courses that require the use of forestry machinery which can be used within a public space and domestic garden setting.

Figure 72: AEB Funded Enrolments Forestry workers (Green Increased Demand)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Award in Chainsaw Maintenance and Cross-cutting	Level 2	Short	20	10	0
Award in Tree Climbing and Rescue	Level 2	Short	20	0	0
Award in Safe Use of Manually Fed Wood-chipper	Level 2	Short	10	10	0
Award in Felling and Processing Trees up to 380mm	Level 2	Short	10	0	0
Award in Ground Based Chainsaw Operation	Level 2	Short	10	10	0
Extended Certificate in Forestry and Arboriculture	Level 2	Medium	0	10	0
BTEC Technical Diploma in Forestry and Arboriculture	Level 2	Medium	0	0	10

Figure 73: Apprenticeship Standards Agricultural and fishing trades n.e.c.

Apprenticeship Standard Title	Level	20/21
Arborist	Level 2	17
Forest Operative	Level 2	2

4.6 POTENTIAL LEVEL 4/5 PROGRESSION ROUTES

There are just two courses offering higher technical qualifications (Levels 4 and 5) to London learners and both of these are within Arboriculture which is linked to the Forestry Workers occupational areas. However, there were only around 10 learners on each of these courses in 2019/20. There were no Level 3 learners in courses related to Forestry Workers in either 2018/19 or 2019/20 and therefore progression routes from Level 2 to higher level qualifications appears to be difficult.

The largest occupational areas linked to this sector, including horticulture and gardening / landscape gardening do not appear to be supported by qualifications at Levels 4 or 5.

Figure 74: Level 4/5 Courses

Qualification	**Level**	**19/20**
Certificate in Arboriculture	Level 4	10
Diploma in Arboriculture	Level 4	10

Source ILR 2019/20 (Data Cube) & HESA 2019/20

PART FIVE: ENERGY AND THE CIRCULAR ECONOMY

5.1 INTRODUCTION

Introduction

This section of the report focuses on green skills issues in the Energy sector and includes data on AEB funded courses and apprenticeships. Historically, skills provision in the Energy sector is relatively small in London due to the lack of large-scale power generation facilities. This section of the report also includes findings from fieldwork interviews with providers (including London Boroughs) and employers in the Energy sector.

Background Context

The Green Jobs Taskforce Report[17] defines the energy and power sector as including renewables (such as wind, solar, biomass and hydropower), nuclear power, grid infrastructure, energy storage and smart systems technology.

The London Plan 2021 states that London currently sources 95% of its energy from outside GLA boundaries. However, in order to meet net zero carbon targets, the ambition is to move towards more power and heat for buildings being generated from local clean, low carbon and renewable sources. This will require local skills.

Renewable electricity generation in the UK outperformed fossil fuels for the first year ever in 2020, with offshore and onshore wind providing more than half of the country's renewable electricity last year[18]. Renewables generated 43 per cent of the UK's electricity, while fossil fuels provided 38.5 per cent. Offshore and onshore wind accounted for 24.2 per cent in the renewables share: offshore wind 13 per cent and onshore wind 11.2 per cent. Low carbon sources, including renewables and nuclear power, together generated 59 per cent of the UK's electricity in 2020, according to the figures in the latest Energy Trends report published by the Department for Business, Energy and Industrial Strategy (BEIS). Electricity generation from renewable sources has increased year on year and the latest annual record was driven mainly by high levels of generation from wind, which increased by 18 per cent compared to 2019.

The Green Jobs Taskforce Report stated that the UK currently holds a leading global position in offshore wind capacity, and the sector is expected to continue to experience significant growth, with an increase in the demand for workers and skills ahead of the government's goal of 40 gigawatts (GW) of offshore wind by 2030. London's low carbon market snapshot 2019 estimates that offshore and onshore wind sector is worth £4.14 billion pounds to the London economy. The London Array is a 175-turbine 630 MW Round 2 offshore wind farm located 20 kilometres (12 mi) off the Kent coast in the outer Thames Estuary in the United Kingdom. It was the largest offshore wind farm in the world until Walney Extension reached full production in September 2018.

The continued development of the offshore wind sector will require a broad range of skills, including asset management, offshore-specific skills (e.g. confined spaces, working at heights), advanced first aid and rescue, project management, engineering and technical skills (e.g. mechanical, electrical and control &

[17] Green Jobs TaskForce (2021) Report to Government
[18] Offshorewind.biz

instrumentation, blade and turbine technicians) and science (e.g. marine biology, geophysics, hydrography, oceanography).

To reach net zero, electricity networks will need to be upgraded. A recent report by the National Grid[19] estimates a need to recruit for 400,000 energy jobs between now and 2050 to get to net zero. There is likely to be significant job growth, the report states, in areas such as digital, power engineering, green construction, biodiversity and habitat management.

The London Plan 2021 states that there is also a need to increase the amount of renewable energy generated on site (in homes and in businesses) or in the neighbourhood, to supplement electricity supplied by the grid. This includes the use of solar photovoltaics, heat pumps and solar thermal, both on buildings and at a larger scale on appropriate sites. There is also potential for wind and hydropower-based renewable energy in some locations within London. Smart systems technologies, including energy storage and demand-side response, will be critical to integrating renewables and low carbon heat and transport onto the power systems.

In August 2021 the Department for Business, Energy and Industrial Strategy launched the UK's first ever Hydrogen Strategy with the ambition to create a thriving low carbon hydrogen sector in the next decade and beyond. The plan involves working with industry to generate 5GW of low carbon hydrogen production capacity by 2030 for industry, transport, power and homes. The Government's analysis suggests that 20-35% of the UK's energy consumption by 2050 could be hydrogen-based. The growth of these industries is initially expected to be centred on the early deployment of hydrogen production technologies which should lead to a new demand for workers.

A Circular Economy is defined in the London Plan as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste. The end goal is to retain the value of materials and resources indefinitely, with no residual waste at all. The transition to a circular economy places a growing focus on waste prevention and resource efficiency across a variety of sectors. Research suggests that the growth of circular economy in sectors such as repair, remanufacture, and refill, could create between 54,000 to 102,000 net jobs across all regions in the UK by 2030[20]. Shifting towards more circular economy activities has the potential to decrease demand for imported goods and increase jobs locally, especially through repairs.

GLA Economics identified one particular occupation, with entry requirements at Level 3 and below, where new and emerging green skills will be required: 'Energy Plant Operative' (SOC 8124). The analysis in this section reviews AEB funded courses that support this occupation. The Energy and Power sector predominately requires higher level skills and cross cutting enabling skills such as Engineering, Science and Digital. Part Seven of the report looks in detail at courses in these areas.

Figure 75: Green Occupations in Energy and the Circular Economy

SOC10	Occupation	Green Occupation Type
8124	Energy Plant Operatives	Green New and Emerging

[19] National Grid (2020), Building the Net Zero Energy Workforce
[20] WRAP/Green Alliance (2015), Employment in the circular economy

5.2 RESEARCH FINDINGS: FIELDWORK

Summarised below are key issues from interviews with providers and employers. A full list of interview respondents is given in Appendix 2.

Providers

1. Providers in general are not offering specialist energy and power distribution courses under the Adult Education Budget as they believe there is insufficient demand from learners and employers at this level.
2. However, many providers offer engineering and other STEM related courses which provide a progression pathway into this industrial sector (see Part Six of this report).
3. One college said that their curriculum planning strategy mandates that all curriculum areas need to report on sustainability and working towards net zero. The college has introduced resources to support green skills within engineering, electrical construction and design management. They are focussing on Solar PV, Wind, Water Generation and Electrification of Cars. In addition, the college aim to include units within the existing curriculum to ensure they cover all targets.
4. There is often an overlap in the skills required in sectors such as building, transport and energy and the need for multi-skilling is likely to become even more important as we move towards net zero and implement smart integrated infrastructure solutions (e.g. use of digital technology to monitor energy consumption and adjust in real time the way it is used in order to maximise efficiency).

Employers

1. One energy company said that within the last 5 years it has become more apparent that they need to focus not only on the big energy solutions like wind farms, but also on more local decarbonisation within existing buildings and city centres. This is where the current skills shortages exist (see Part 3).
2. Main roles in which they struggle to find the right skills include Project Development Management, Engineers (Junior and Senior) and Site Management.
3. Project Development Management is a multi-skilled role with skills required in planning, electricity networks, engineering development and dealing with sub-contractors and suppliers.
4. Many of the skills needed would come from existing trained electrical and mechanical engineers with the additional upskilling in new technologies and practices. Digital skills were cited as being important, particularly data analysis.
5. A large employer said that they were committed to training. However, they are also considerate of the risks, such as losing staff to other employers after large training investment. They would like to see more public support for training and the availability of affordable training so individuals can invest in their own training and start with the right skills.
6. Individuals working in the industry still require traditional skills as well as learning about sustainable and low carbon solutions. Flexible, modular training opportunities would be welcome.

5.3 RESEARCH FINDINGS: DATA ANALYSIS

Sections 5.4 and 5.5 provide a detailed analysis of learner data in the Energy sector, focusing on courses funded through the Adult Education Budget and apprenticeships, summarised below are key findings from the data analysis.

1. There are only a small number of learners taking specific energy and power distribution related courses funded by the Adult Education Budget and numbers have been declining in recent years. In 2019/20 the number of learners in this category was 350. There were no courses specifically focusing on renewable energy sources such as wind power, solar or tidal.
2. It is likely that the energy sector is also recruiting employees with cross-cutting enabling skills such as digital, science and engineering. AEB provision in this area is discussed in Part Six of the report.
3. The vast majority of learners in this category are enrolled at further education colleges. The proportion of ethnic minorities taking these courses is higher than the proportion of ethnic minorities in the London population as a whole.
4. Most AEB funded learners in this category are taking the Level 1 Certificate in Introduction to Energy qualification. There is no evidence that an AEB funded progression route exists from this qualification to higher levels of study.
5. There are several apprenticeship standards relevant to the energy and power distribution sector including Power Network Craftsperson, Electrical Power Networks Engineer, Junior Energy Manager, Electrical Power Protection & Plant Commissioning Engineer and Nuclear Scientist & Nuclear Engineer. However, the number of London residents taking these apprenticeships is very small (a total of 38 apprentices in 2020/21).
6. There were no Level 4 or 5 qualifications in this area in 2019/20.

5.4 OVERVIEW OF CURRENT ADULT SKILLS PROVISION

Figure 76 shows that in 2019/20 there were 350 learners in Greater London taking specific Energy AEB related courses associated with green occupations (identified by GLA Economics). This was a 44% decline in learner numbers compared to the previous year. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 76: AEB Learners – Energy Green Skills Category

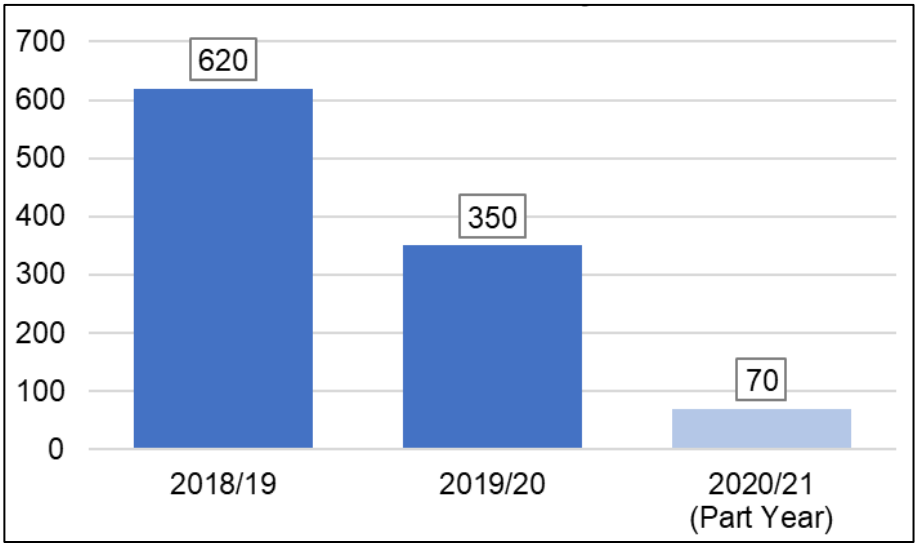


Figure 77: Enrolments and Learners – Energy Green Skills Category

Year	Enrolment	Learners
2018/19	620	620
2019/20	350	350
2020/21 (Part Year)	70	70

In 2019/20, all of the Energy AEB funded learners were enrolled at colleges. In 2018/19 there were 40 learners enrolled at private training providers but no learners enrolled at this provider type in subsequent years.

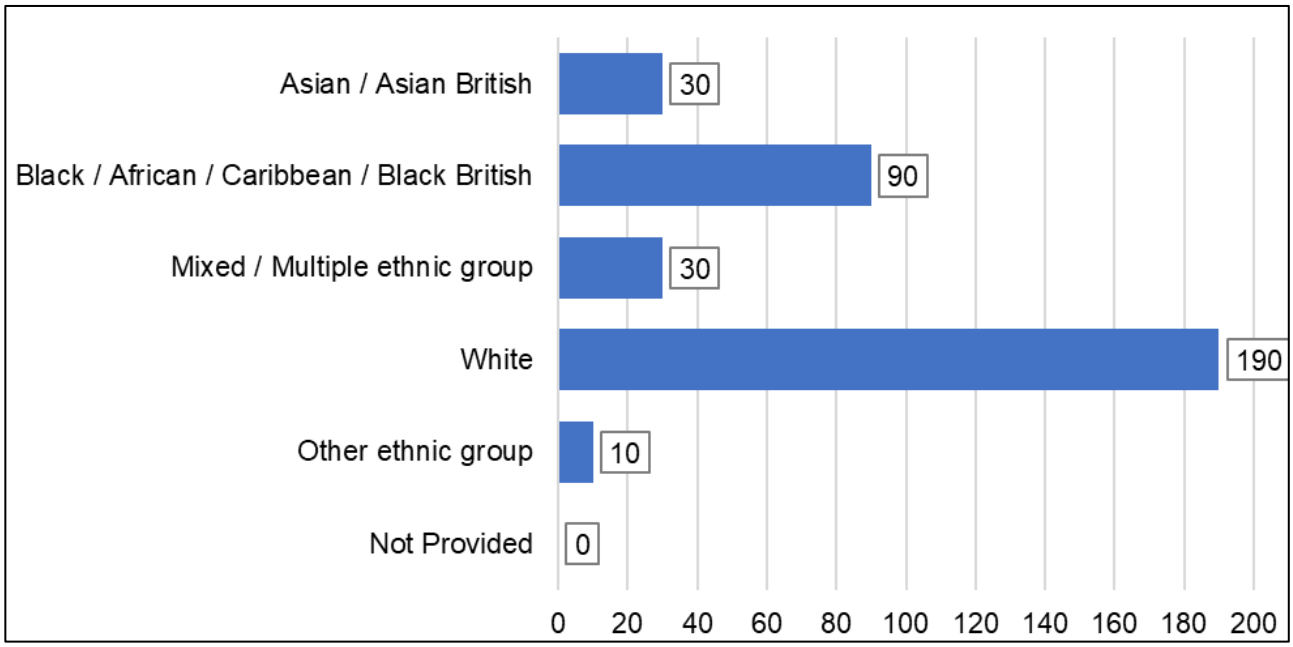
Figure 78: AEB Energy Green Skills by Provider Type 2019/20

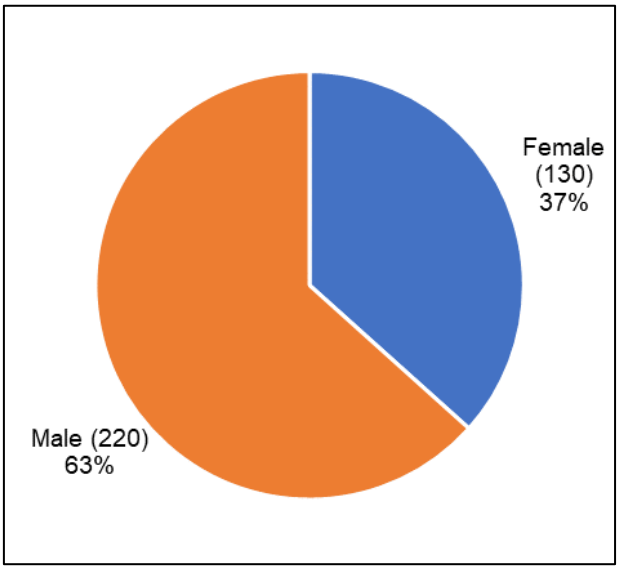
Provider Type	2018/19	2019/20	2020/21
Colleges	580	350	70
Other Public Funded - LAs	0	0	0
Private Training Providers	40	0	0

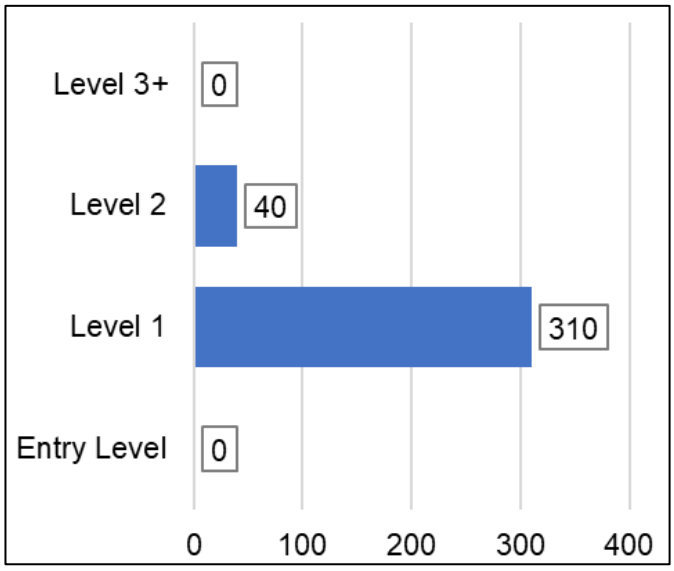
Figure 79 show the breakdown of Energy learners on courses designated as green by ethnicity, sex and level of study. The majority of learners were male (63%) and were studying at Levels 1. This suggests that very few of these learners will be progressing to higher technical education.

Approximately 55% of learners were White, 26% Black/African/Caribbean/Black British and 9% Asian/Asian British. This is a higher proportion of ethnic minorities compared to the population of Greater London as a whole.

Figure 79: AEB Energy Green Skills by Learner Characteristic 2019/20

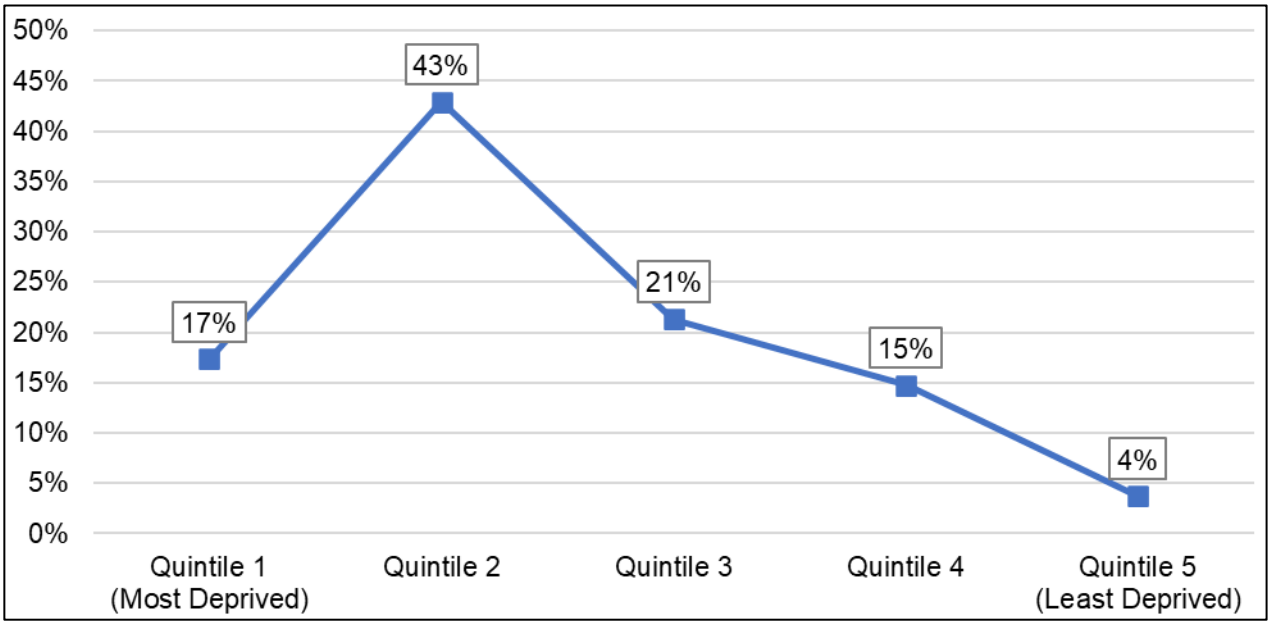






The deprivation profile of green classified learners is shown in Figure 80. More than 60% had a home postcode in the two most deprived quintile in England and very few learners lived in the most affluent parts of Greater London.

Figure 80: AEB Energy Green Skills by Learner Characteristic 2019/20



5.5 DETAILS OF CURRENT PROVISION BY OCCUPATION

Energy Plant Operatives

Energy Plant Operative is the only specific energy related occupation identified by GLA Economics with an entry qualification at Level 3 or below. The AEB recorded two qualifications in 2019/20 directly relevant to this occupation. The Certificate in Introduction to Energy is validated by the awarding organisation ABC & Certa Awards. It is a 135 hour qualification and the content covers an introduction to renewable energy sources and sustainability. The qualification has been developed to raise awareness of energy issues and create interest in future careers in the energy industry.

Figure 81: AEB Funded Enrolments Energy plant operatives (Green New & Emerging)

Learning Aim Title	Level	Size	18/19	19/20	20/21
Certificate in Introduction to Energy	Level 1	Medium	570	310	50
Certificate in Electrical Power Engineering - Distribution and Transmission Technical Knowledge	Level 2	Medium	30	20	20

The City and Guilds Certificate in Electrical Power Engineering - Distribution and Transmission Technical Knowledge comprises three modules, a 2-day protection part one course, a 3-day protection part 2 course and a 2-day commissioning and testing course. The course allows candidates to gain the knowledge required for employment and/or career progression in electricity distribution and transmission. The course also serves as the knowledge component in the Apprenticeship Standard.

The BPEC Diploma in Smart Metering (Figure 82) is a nationally recognised qualification developed in consultation with Energy and Utility Skills and the National Skills Academy for Power. Installing smart meters is likely to become increasingly important as we move towards net zero.

Figure 82: AEB Funded Enrolments Other Energy Courses

Learning Aim Title	Level	Size	18/19	19/20	20/21
Diploma in Smart Metering - Dual fuel	Level 2	Medium	20	20	10

There are several Apprenticeship Standards relevant to the Energy sector (Figure 83). The Apprenticeship in Power Network Craftsperson recruited 21 trainees in 2020/21. A Power Network Craftsperson has responsibility for the safe construction, maintenance and repair of the UK's electrical power network, to provide a safe and reliable supply of electricity to the country. This involves working at various locations across a company's power network. Learner numbers on other relevant apprenticeship standards were very low in 2020/21.

Figure 83: Apprenticeship Standards Starts Energy

Apprenticeship Standard Title	Level	20/21
Power Network Craftsperson	Level 3	21
Electrical Power Networks Engineer	Level 4	5
Junior Energy Manager	Level 3	5
Electrical Power Protection and Plant Commissioning Engineer	Level 4	4
Nuclear Scientist and Nuclear Engineer (Integrated Degree)	Level 6	3

PART SIX: ENABLING SKILLS (STEM)

6.1 INTRODUCTION

The transition to net-zero will require an array of skills not specific to green industrial sectors. It has been highlighted in a recent study from the World Economic Forum[21] that only three out of the top ten skills identified in the 'green economy' are industry specific.

Part Six of the report[22] focuses on 'Enabling Skills' that are needed to make new green solutions happen. These are predominately STEM skills such as digital, science, engineering and manufacturing. Individuals in STEM areas will often be involved in 'green' product development, implementation and testing, research and innovation. Whilst many of the required skills will be at graduate level there will also be a need for technicians and support staff funded through the Adult Education Budget. The AEB also provides a possible progression pathway through to higher level skills.

6.2 DIGITAL SKILLS

Digital technology and data are seen to be at the core of the net zero transition, enabling emissions monitoring as well as data-driven applications and services underpinning emission savings across sectors. The Royal Society report that digital technology, from smart meters to supercomputers, weather modelling and AI, could help deliver nearly one third of the carbon emission reductions required by 2030. The Royal Society go on to say that action is needed to build digital and net zero skills at all levels – from basic literacy to advanced data analysis skills, and from an appreciation of efficiency to an in-depth understanding of carbon externalities. Re-tooling the workforce in this way will require a coordinated approach to nurturing data science and net zero skills across the country.

The Green Jobs Taskforce report highlights the importance of skills in digital and data analytics for the net zero workforce across a range of sectors. The renewable energy sector for example will require better use of data and digitisation skills to enable a reliable smart grid infrastructure. EVs will require efficient digital control of batteries and motors to achieve the require range and maximise emission reductions. Home heating systems which utilise efficient AI heating controllers are saving consumers money and the increasing use of digital twin technology could help achieve improved efficiencies across many sectors from wind farm energy production through to understanding the impact of farming on system resilience.

In the recent Friends of the Earth report[23] a recommendation is made to expand the existing Skills Bootcamp programme, targeting provision of green skills to unemployed young people, particularly in geographic areas where skills shortages have been identified. These initially focused on digital skills and were trialled in Derbyshire and Nottinghamshire, Greater Manchester, Liverpool City Region, Leeds City Region and parts of South West England.

[21] World Economic Forum, 2020. Jobs of Tomorrow, Mapping Opportunity in the New Economy (as cited in Aldersgate 2020; Upskilling for the 21st century).
[22] Part Seven focuses on generic skills to support the move towards net zero which may be required by all businesses and citizens but are not in themselves involved directly in green solutions.
[23] Friends of the Earth and Transition Economic, 2020, An Emergency Plan for Green Jobs for Young People)

Many of the employers that we spoke to, across a range of different sectors, stressed the importance of digital skills and the difficulty of recruiting data analysts, software developers, programmers and AI specialists. This was being driven by smart metering, the inter-connectivity of different systems (e.g. within a building or within a locality) and the harvesting of customer data to improve efficiency and reduce carbon emissions. For example, electric cars utilise an increasing amount of digital and AI technology in order to increase range, performance, reliability and driver safety. A personal transport company in London told us that digital skills are needed in order to develop an effective technical team running the mobile web app, company website and backend systems. This helped them ensure that the business operates effectively and identifies the best travel routes and collection and delivery schedules in the most time efficient way.

As well as IT specialists, such as programmers and data analysts, there is a need, we were told, for all employees to have a basic level of IT literacy in order to use, install or maintain the latest green products and services.

Overview of Current Adult Skills Provision

IT Practitioners

Figure 84 shows that in 2019/20 there were 2,170 AEB funded learners taking IT practitioner courses (these are courses that develop IT specialist skills). The number of learners has been increasing over the past three years. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 84: AEB Learners – IT Practitioners

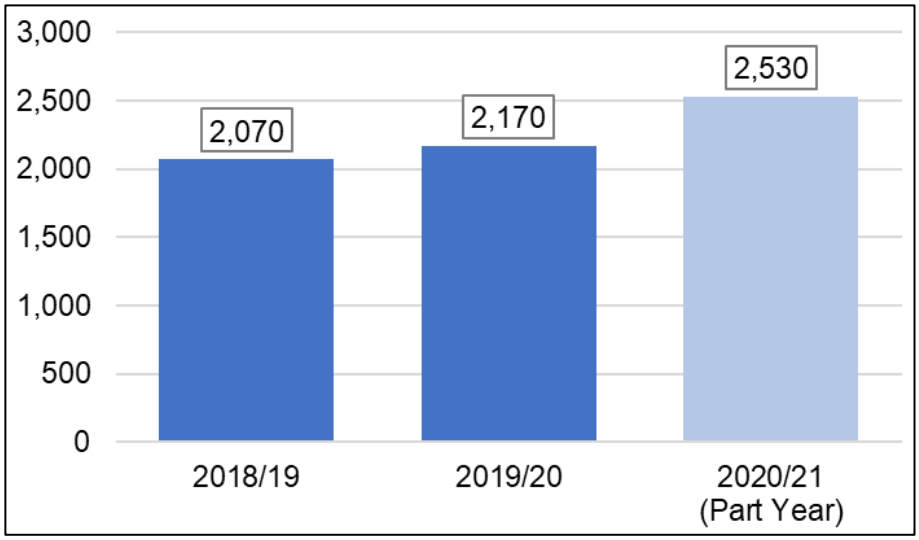


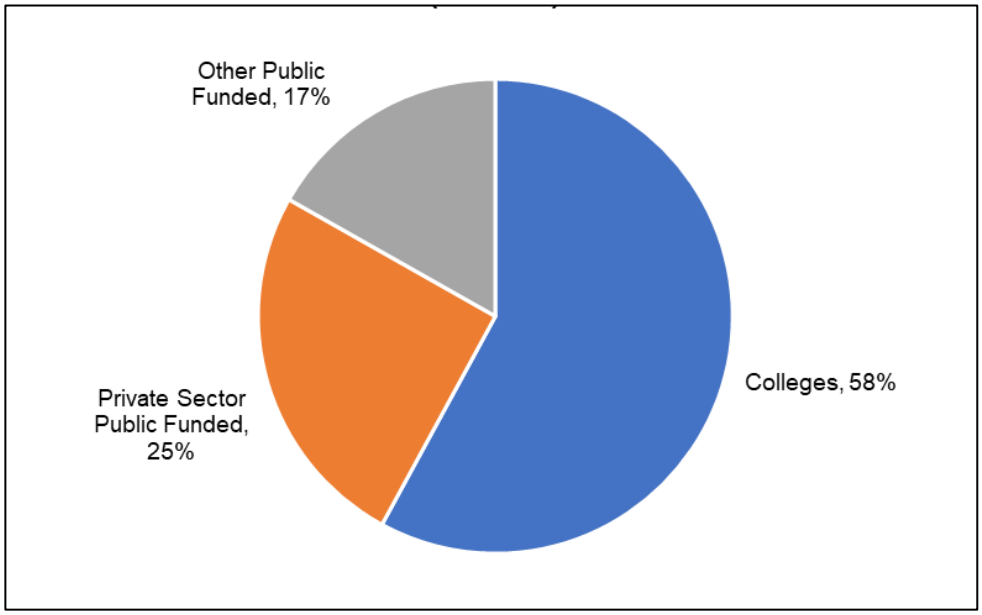
Figure 85: Enrolments and Learners – IT Practitioners

Year	Enrolment	Learners
2018/19	2,310	2,070
2019/20	2,430	2,170
2020/21 (Part Year)	3,010	2,530

IT Practitioner courses are being delivered by a wide range of provider types including GFE Colleges, Private Training Providers, London SDIs and Local Authorities (Figure 86).

Figure 86: AEB Learners - IT Practitioners by Provider Type 2019/20

Provider Type	2018/19	2019/20	2020/21
Colleges	1,040	1,260	1,600
Other Public Funded - LAs	580	360	620
Private Training Providers	450	550	310

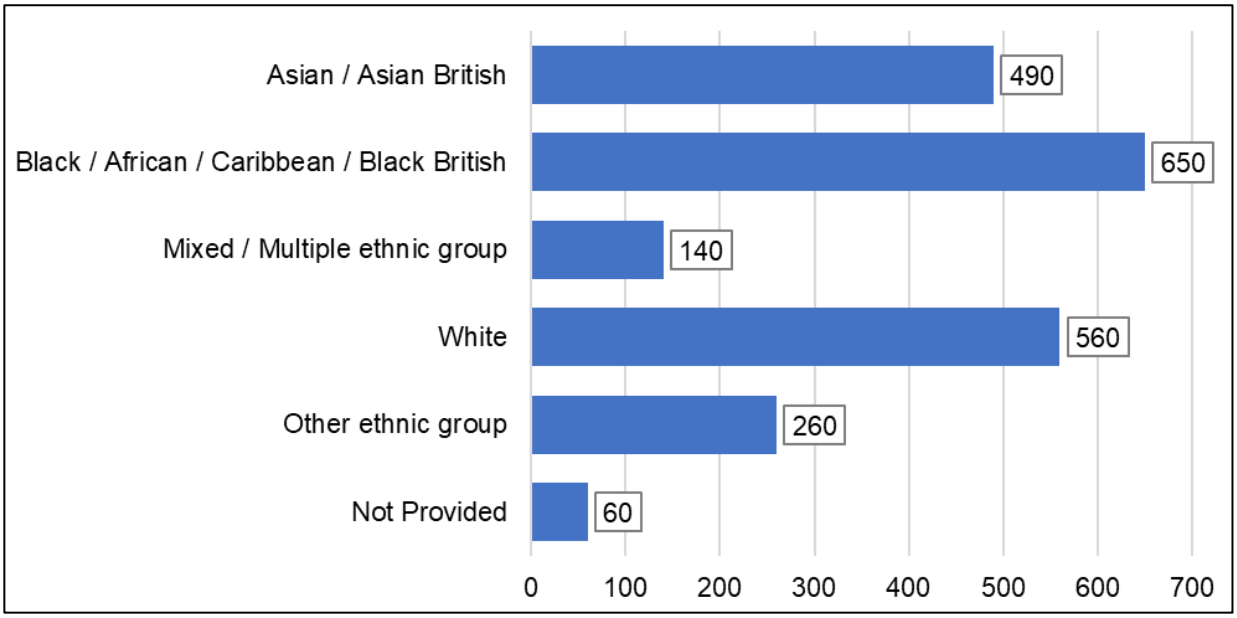


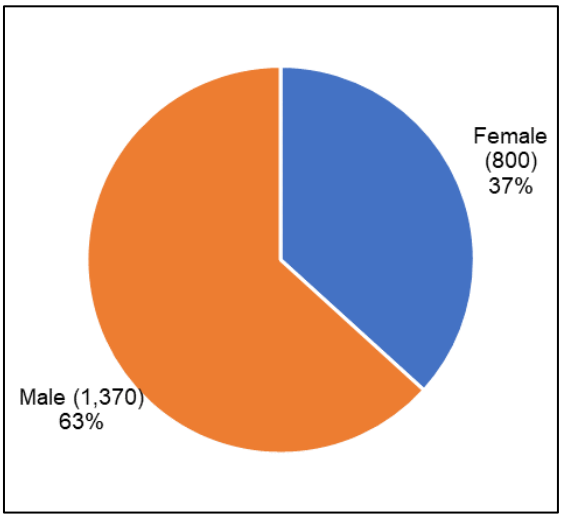
Approximately 30% of learners on IT Practitioner courses were Black/African/Caribbean/Black British, 26% were White and 23% were Asian/Asian British (Figure 87). This is a significantly higher proportion of ethnic minorities and a lower proportion of White learners compared to the population of Greater London as a whole. Almost two thirds of learners were male and most were studying at Level 2.

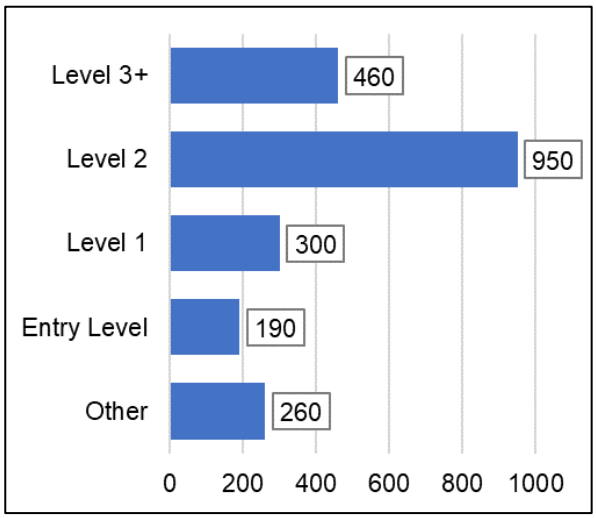
One of the most popular qualification courses is the Level 2 Diploma in ICT Systems Support which provides a broad range of skills including computer systems, networking principles, systems architecture and web fundamentals. In 2019/20 approximately 470 London based learners enrolled on this course. The BTEC Extended Diploma in IT is a full time Level 3 qualification that can provide direct entry into employment in green sectors of the economy or progression to higher education. Over 160 learners enrolled on this programme in 2019/20.

There are a large number of Level 4 and 5 courses for IT practitioners (Figure 88) providing possible progression routes for AEB funded learners. The most popular courses in 2019/20 were the BTEC Higher National Diploma in Computing and the Foundation Degree in Computer Science.

Figure 87: AEB IT Practitioners by Learner Characteristic 2019/20







Learning Aim Title AEB Funded Enrolments	Level	Size	18/19	19/20	20/21
Diploma in ICT Systems Support	Level 2	Medium	550	470	220
Non regulated Community Learning provision, ICT for Practitioners	Other	Unknown	550	300	190
Non regulated SFA formula funded provision, Entry Level, ICT Practitioners, 13 to 20 hrs, PW B	Entry Level	Short	70	210	570
Certificate of Introduction to Digital Skills	Level 1	Medium	0	200	560
Extended Diploma in IT (QCF)	Level 3	Long	160	160	110
BTEC First Extended Certificate in Information and Creative Technology	Level 2	Medium	90	130	130
Diploma in Professional Competence for IT and Telecoms Professionals	Level 2	Medium	100	100	70

Figure 88: Level 4/5 Courses

Qualification	Level	19/20
BTEC Higher National Diploma in Computing	Level 5	160
Foundation degree in computer science	Level 5	120
BTEC Higher National Certificate in Computing	Level 4	80
Certificate of Higher Education (CertHE) in computing and information technology	Level 4	40
Certificate of Higher Education (CertHE) in computer science	Level 4	30
Diploma of Higher Education (DipHE) in computing and information technology	Level 5	30
Foundation Degree in Computing Software Engineering	Level 5	30
Foundation degree in creative computing	Level 5	20
Foundation degree in databases	Level 5	20
Foundation Degree in Business Information Technology	Level 5	20
Higher National Certificate (HNC) in computing and information technology	Level 4	10
Foundation degree in computing and information technology	Level 5	10

Source ILR 2019/20 (Data Cube) & HESA 2019/20

IT Users

In 2019/20 there were almost 13,000 learners taking AEB funded IT User courses. These are courses that provide basic IT skills such as using the internet, sending e-mails and operating digital equipment. The number of IT user learners has been declining in recent years, possibly reflecting the increased IT literacy of the general population.

Figure 89: AEB Learners – IT for Users

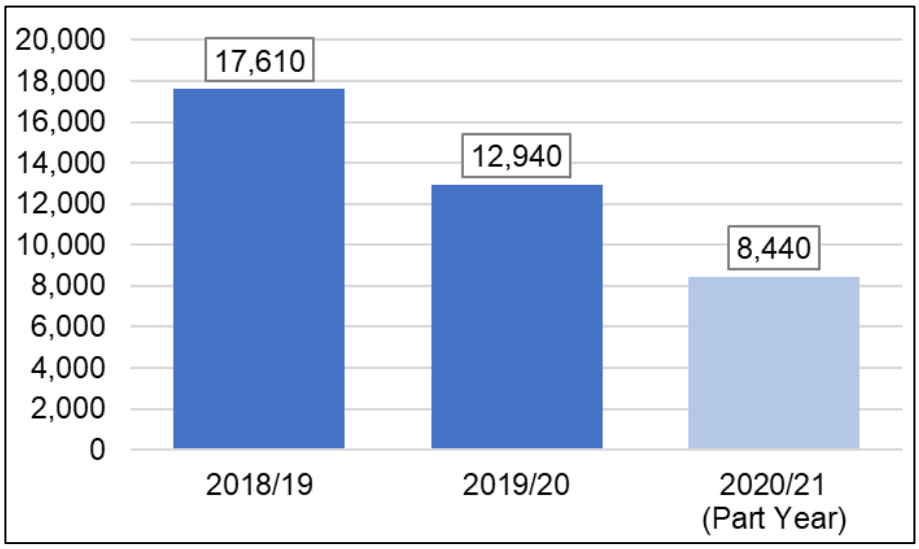


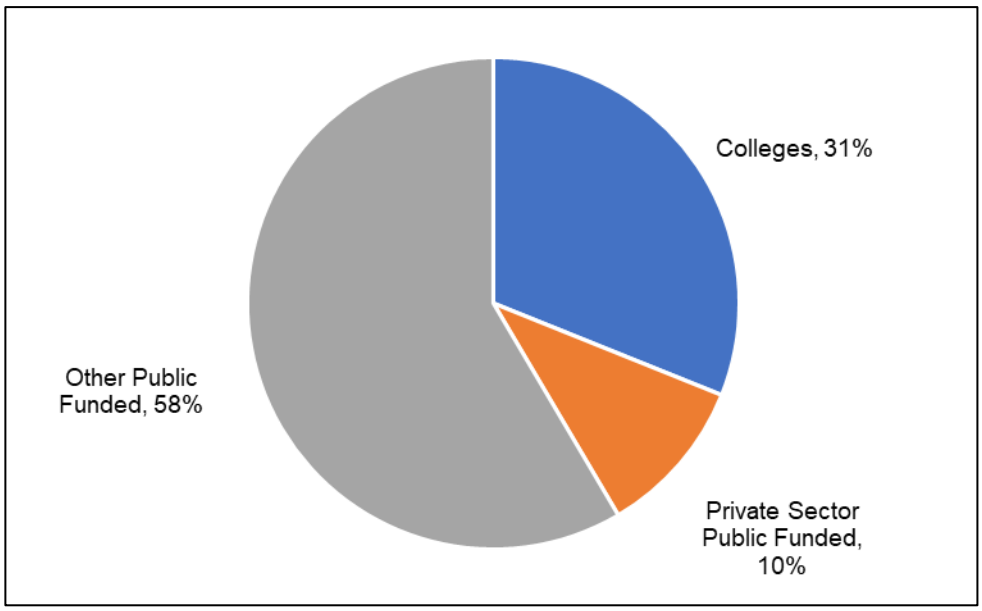
Figure 90: Enrolments and Learners – IT for Users

Year	Enrolments	Learners
2018/19	23,960	17,610
2019/20	17,590	12,940
2020/21 (Part Year)	10,420	8,440

A high proportion of IT User courses are delivered by providers such as Local Authorities and London SDIs (58% of learners in 2019/20) often in local community venues (Figure 91) as part of the community learning offer. Colleges were also major providers of IT User courses in 2019/20 enrolling 31% of learners.

Figure 91: AEB Learners - IT for Users by Provider Type 2019/20

Provider Type	2018/19	2019/20	2020/21
Colleges	5,600	4,020	3,740
Other Public Funded - LAs	9,870	7,570	3,920
Private Training Providers	2,150	1,350	780

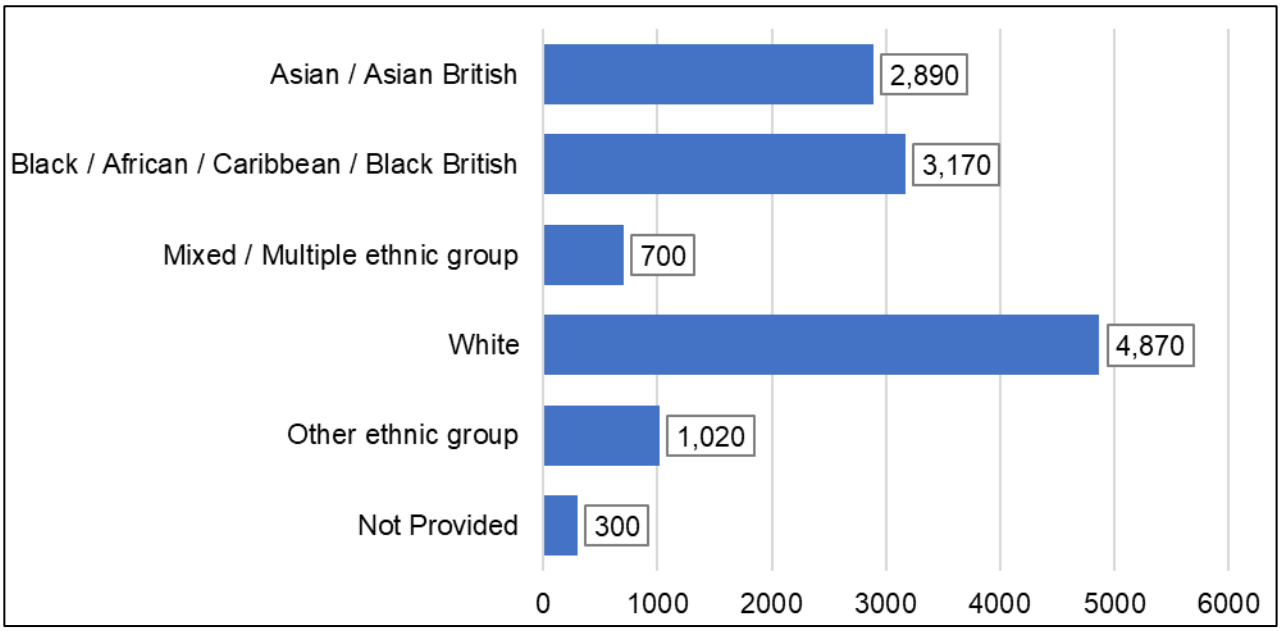


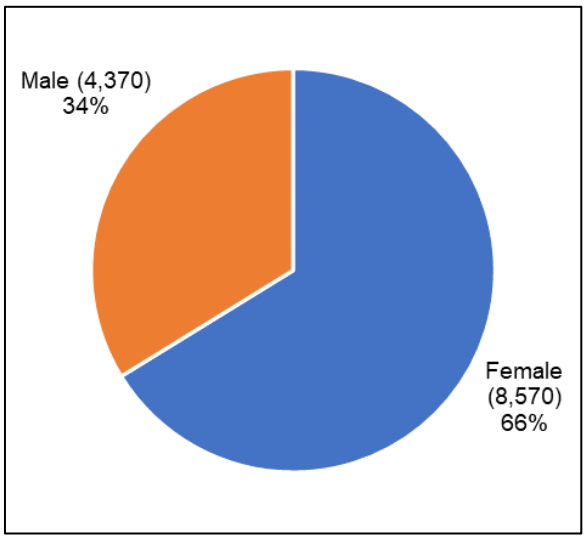
Compared to learners on IT Practitioner courses, a higher proportion of learners on IT User courses were White British (38%) and a smaller proportion were Black/African/Caribbean/Black British (24%). However, the proportion of learners on IT User courses from ethnic minorities is still higher than the proportion of ethnic minorities in the population.

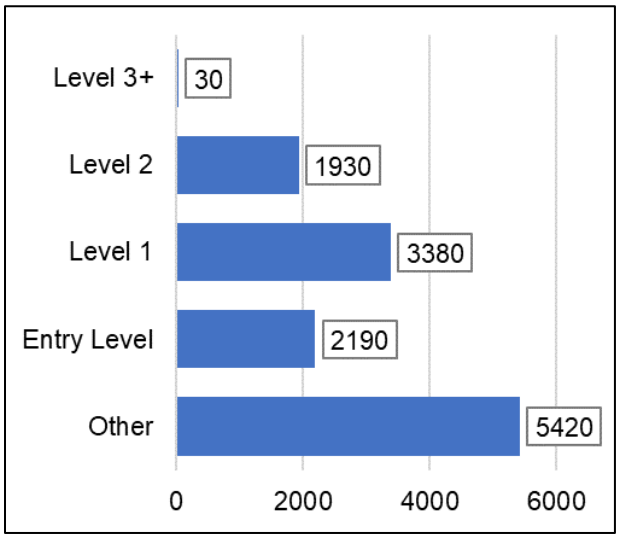
Approximately two thirds of learners on IT User courses were female, compared to only 37% on IT Practitioner courses (Figure 92). This suggests that very few learners progress from IT User courses to IT Practitioner courses.

A high proportion of IT User courses are delivered as community learning provision and are often short in duration (less than 120 hours). The target market is typically learners with few prior qualifications and/or are unemployed and the skills acquired on the course help them to secure jobs that require the use of modern technology (increasingly the case as we move towards a net zweo economy).

Figure 92: AEB IT for Users by Learner Characteristic 2019/20







Learning Aim Title AEB Funded Enrolments	Level	Size	18/19	19/20	20/21
Non regulated Community Learning provision, ICT for Beginners / Basic Online Skills	Other	Unknown	7,340	5,220	2,730
Non regulated Community Learning provision, Other ICT Skills	Other	Unknown	3,890	2,840	720
Non regulated SFA formula funded provision, Entry Level, ICT for Users, 13 to 20 hrs, PW A	Entry Level	Short	560	580	980
Award in Internet Safety for IT Users	Level 1	Short	1,070	410	100
Award in Using ICT (Entry 3)	Entry Level	Short	740	570	120

6.3 ENGINEERING, SCIENCE AND MANUFACTURING SKILLS

The Green Jobs Taskforce report states that Science, Technology, Engineering and Mathematics (STEM) skills will underpin jobs that are key to taking forward the green recovery and delivering net zero. For example, scientists will be needed to innovate the technologies for the net zero transition as described in the Government's Energy White Paper on powering our net-zero future as well as providing vital research on climate adaptation, development of new battery technologies and implementation of carbon capture technologies. Equally, engineers will be needed to utilise systems thinking to approach the complex challenges of decarbonisation and will also have a crucial role to play in enhancing the resilience of infrastructure and buildings to climate change.

Interviews with providers and employers highlighted the importance of STEM skills. There was general agreement that training was required for long term sustainable careers that could meet not only the challenges of today but also issues that would arise in the future. This requires well designed progression pathways offering individuals the opportunity to gain higher level skills in the future. Interview respondents were keen to ensure that green jobs were also good sustainable jobs. Research suggests that shifting towards a more circular economy has the potential to decrease demand for imported goods and increase jobs locally, especially through repairs and remanufacture. This has the potential to create significant numbers of new local jobs in manufacturing and engineering.

Engineering

Figure 93 shows that in 2019/20 there were 1,050 AEB funded learners taking Engineering courses. The number of learners has been declining over the past three years.

Figure 93: AEB Learners – Engineering

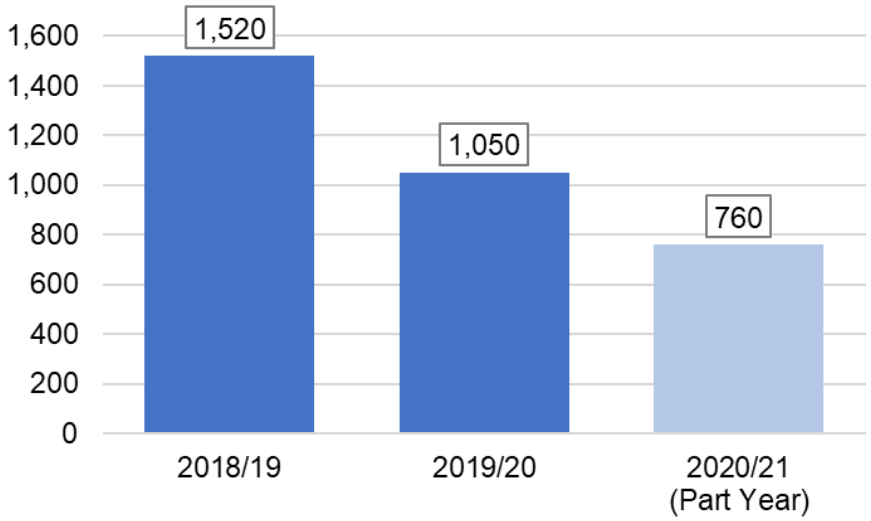


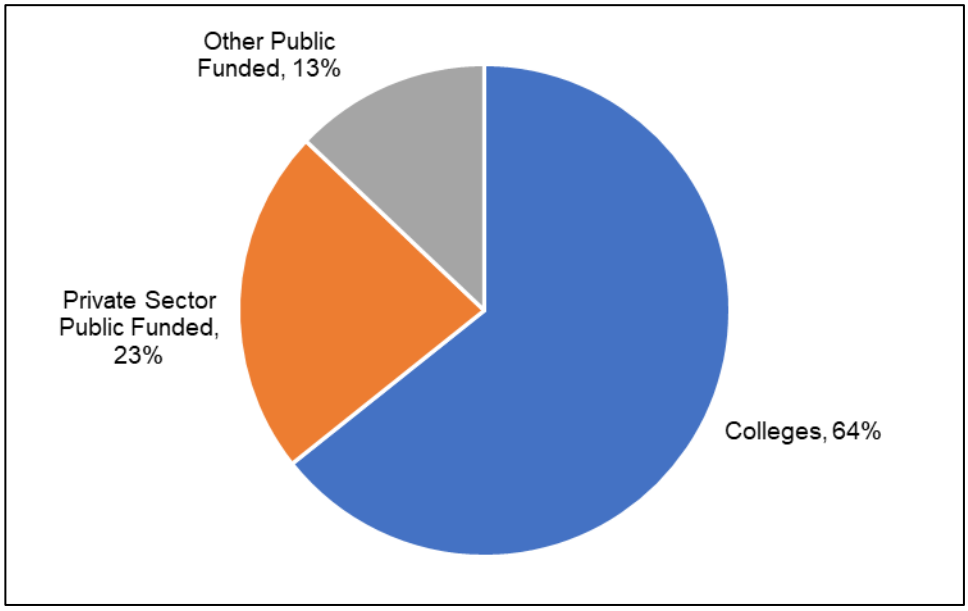
Figure 94: Enrolments and Learners – Engineering

Year	Enrolments	Learners
2018/19	1,590	1,520
2019/20	1,100	1,050
2020/21 (Part Year)	780	760

64% of AEB funded Engineering learners were studying at a GFE College and 23% at a Private Sector Training Provider (Figure 95).

Figure 95: AEB Learners - Engineering by Provider Type 2019/20

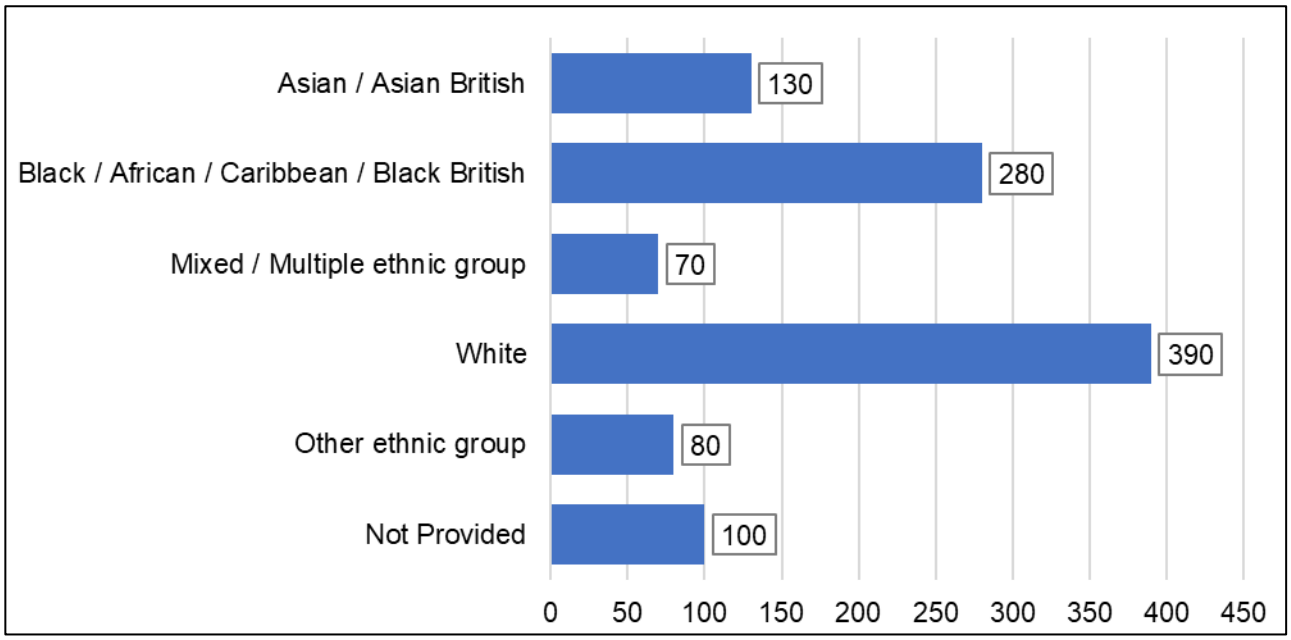
Provider Type	2018/19	2019/20	2020/21
Colleges	870	680	530
Other Public Funded - LAs	180	140	30
Private Training Providers	480	240	200

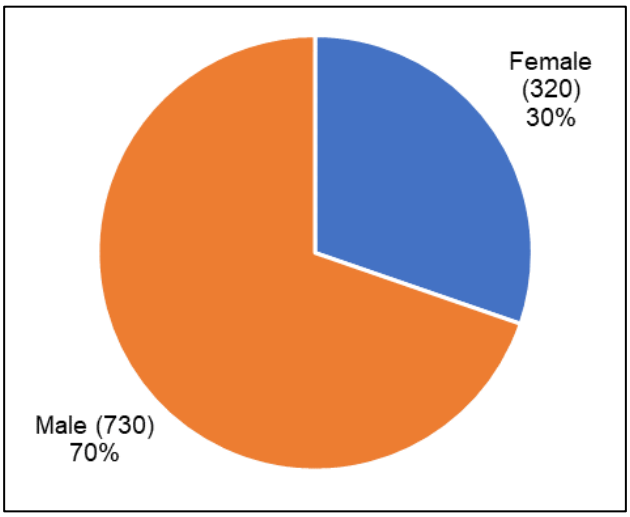


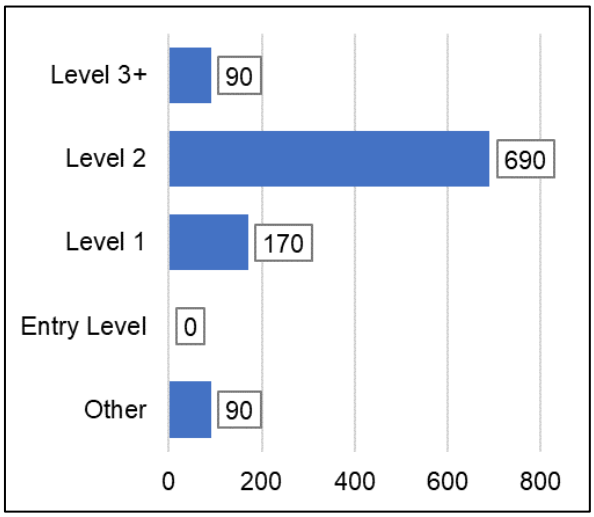
Approximately 37% of Engineering learners were White British and 27% were Black/African/Caribbean/Black British. A relatively low percentage (12%) were Asian/Asian British (Figure 96). 70% of Engineering learners were male and the vast majority were studying at Level 2. The new Level 3 entitlement provides an opportunity for more learners to progress to Level 3 and eventually to higher education, where many of the skill shortages in Engineering exist.

There were a wide range of different AEB funded Engineering courses on offer in London in 2019/20. The most popular course in 2019/20 was the Certificate in Lean Organisation Management Techniques which helps employed adults improve engineering processes by reducing waste and improving efficiency.

Figure 96: AEB Engineering by Learner Characteristic 2019/20







Learning Aim Title AEB Funded Enrolments	Level	Size	18/19	19/20	20/21
Certificate in Lean Organisation Management Techniques	Level 2	Medium	610	300	160
NVQ Diploma in Rail Engineering Track Maintenance	Level 2	Medium	160	170	70
Non regulated Community Learning provision, Engineering	Other	Unknown	150	110	0
Certificate in Engineering and Technology	Level 1	Medium	50	80	100

Figure 97 shows the most popular Level 4 and 5 courses in Engineering. These courses provide potential progression opportunities for AEB funded learners, In 2019/20 150 learners enrolled on the BTEC Higher National Certificate in Engineering.

Figure 97: Level 4/5 Courses

Qualification	**Level**	**19/20**
BTEC Higher National Certificate in Engineering	Level 4	150
Higher National Certificate (HNC) in general or integrated engineering	Level 4	60
BTEC Higher National Diploma in Engineering	Level 5	40
Higher National Certificate (HNC) in electrical and electronic engineering	Level 4	30
Foundation degree in general or integrated engineering	Level 5	10
Foundation degree in civil engineering	Level 5	10

Source ILR 2019/20 (Data Cube) & HESA 2019/20

Science

Figure 98 shows that in 2019/20 there were 1,820 AEB funded learners taking Science courses. The number of learners has been declining over the past three years.

Figure 98: AEB Learners – Science

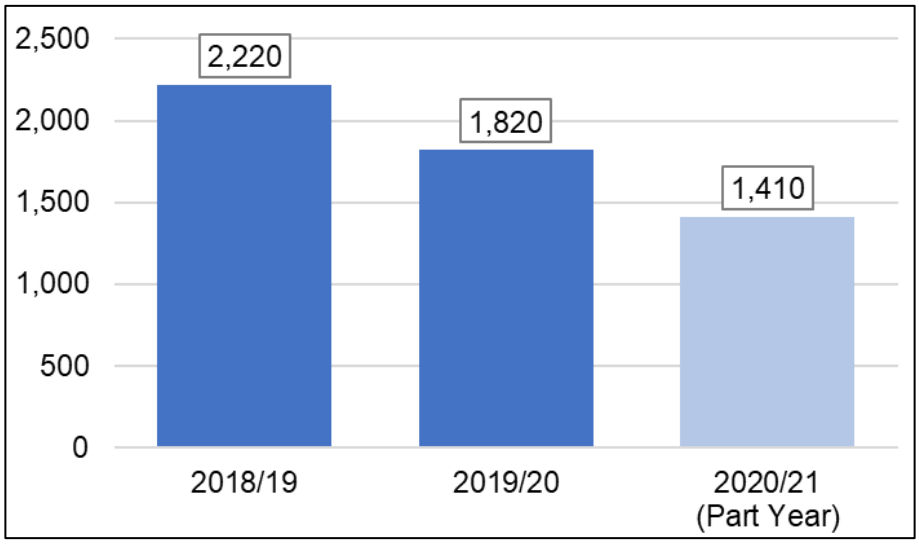


Figure 99 Enrolments and Learners – Science

Year	Enrolments	Learners
2018/19	2,660	2,220
2019/20	2,150	1,820
2020/21 (Part Year)	1,740	1,410

Both GFE Colleges and London SDIs deliver AEB funded Science courses with colleges being the largest provider type in 2019/20 (Figure 100).

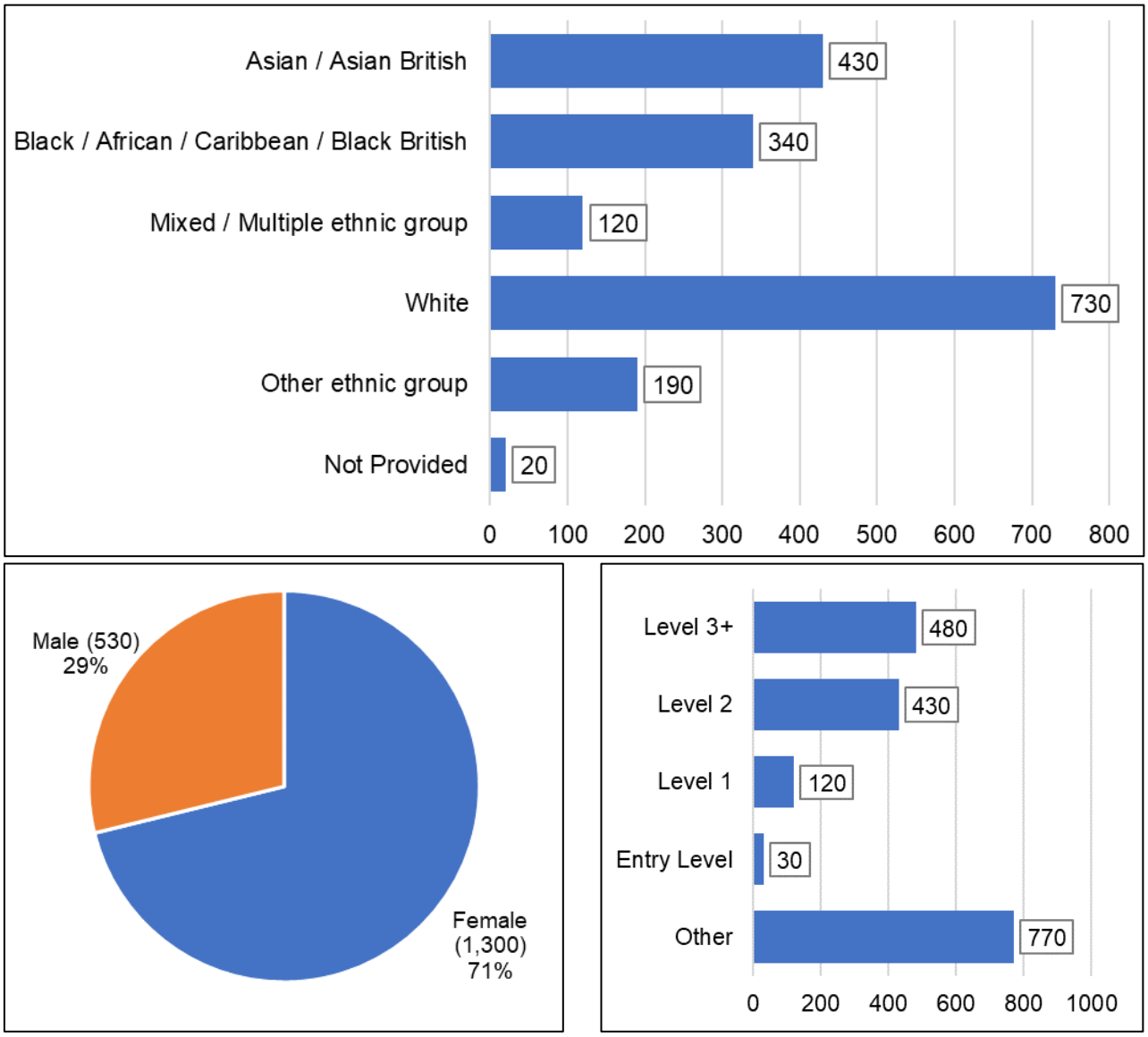
Figure 100: AEB Learners - Science by Provider Type 2019/20

Provider Type	2018/19	2019/20	2020/21
Colleges	980	1,000	980
Other Public Funded	1,200	820	430
Private Training Providers	40	0	0

Around 40% of learners on AEB funded Science courses were White, which is higher than in many other subject areas but lower than the percentage in the overall population (Figure 101). A relatively small proportion of learners studying Science are Black/African/Caribbean/Black British in comparison to other subject areas. Over 70% of learners taking AEB funded are female and most are studying at Levels 2 and 3,

with many likely to be progressing to higher education through HE Access programmes and Extended Diploma.

Figure 101: AEB Science by Learner Characteristic 2019/20



Learning Aim Title AEB Funded Enrolments	Level	Size	18/19	19/20	20/21
Non regulated Community Learning provision, Science	Other	Unknown	1,420	930	520
Access to Higher Education Diploma: Science	Level 3	Long	110	100	140
GCSE (9-1) in Biology	Level 2	Medium	100	100	110
BTEC National Extended Diploma in Applied Science	Level 3	Long	90	90	100

Level 4 and 5 courses in science are shown in Figure 102. The most popular course in 2019/20 was the Foundation Degree In pharmaceutical chemistry with 90 learners. Learners taking the AEB funded Access to HE course in Science are also likely to progress directly to Level 6 qualifications.

Figure 102: Level 4/5 Courses

Qualification	**Level**	**19/20**
Foundation degree in pharmaceutical chemistry	Level 5	90
Higher National Certificate (HNC) in human biology	Level 4	40
Higher National Certificate (HNC) in molecular biology	Level 4	40
Certificate of Higher Education (CertHE) in chemistry	Level 4	30
Certificate of Higher Education (CertHE) in biological sciences	Level 4	30
BTEC HNC Diploma in Applied Biology	Level 4	20
Foundation degree in zoology	Level 5	20
Certificate of Higher Education (CertHE) in biology	Level 4	10
Foundation degree in medical biochemistry	Level 5	10
BTEC HND Diploma in Applied Biology	Level 5	10

Source ILR 2019/20 (Data Cube) & HESA 2019/20

Manufacturing

Figure 103 shows that in 2019/20 there were 400 AEB funded learners taking Manufacturing courses. The number of learners has been declining over the past three years.

Figure 103: AEB Learners – Manufacturing Technologies

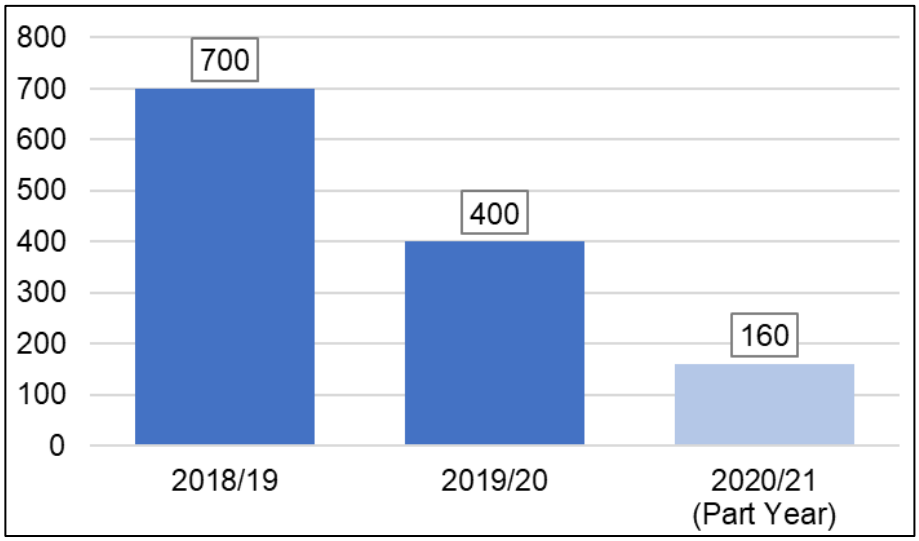


Figure 104: Enrolments and Learners – Manufacturing Technologies

Year	Enrolment	Learners
2018/19	760	700
2019/20	440	400
2020/21 (Part Year)	160	160

GFE Colleges are the largest provider of AEB funded Manufacturing courses (Figure 105) although the number of learners at GFE Colleges in this subject area has been declining.

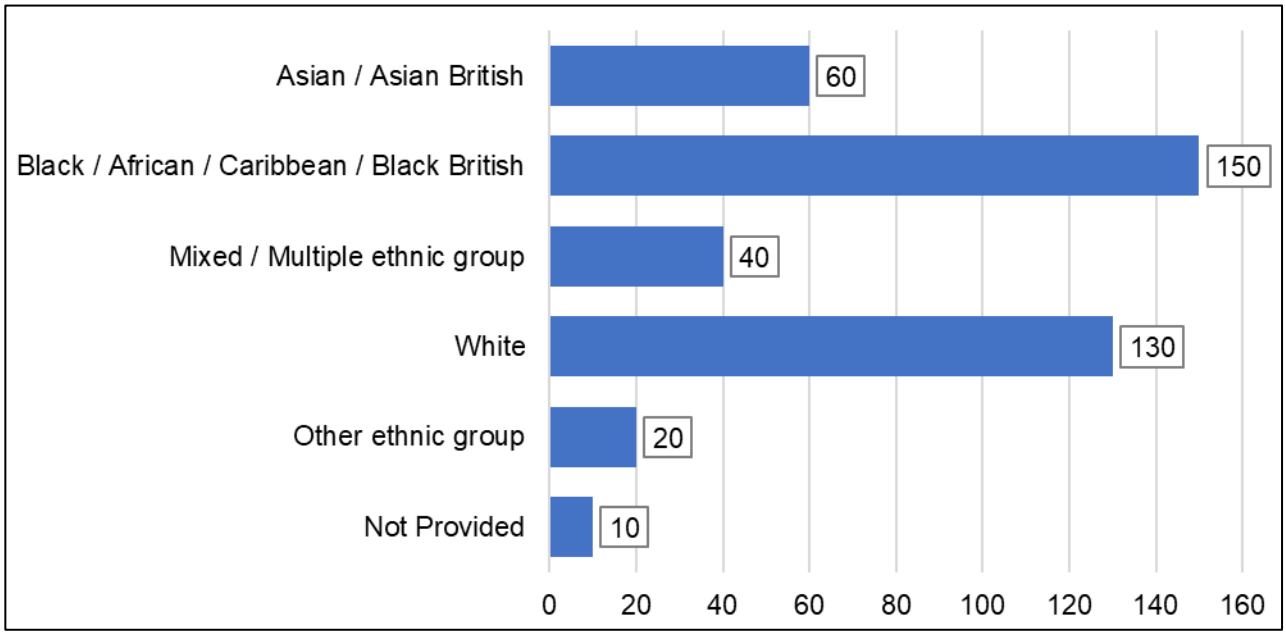
Figure 105: AEB Learners - Manufacturing Technologies by Provider Type 2019/20

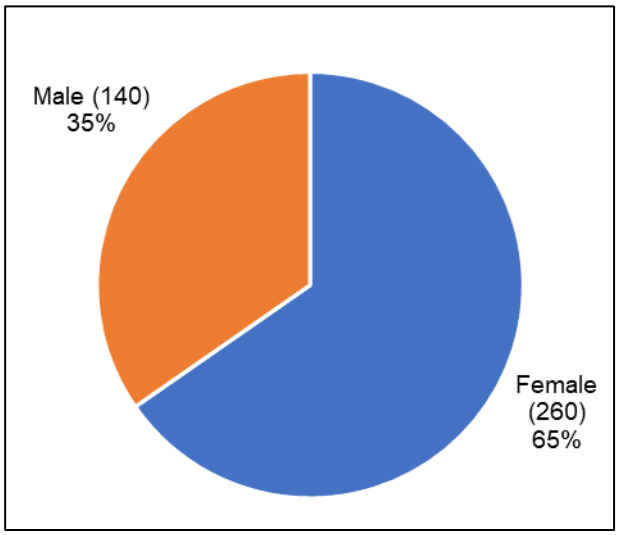
Provider Type	2018/19	2019/20	2020/21
Colleges	400	200	80
Other Public Funded	140	160	80
Private Training Providers	170	40	0

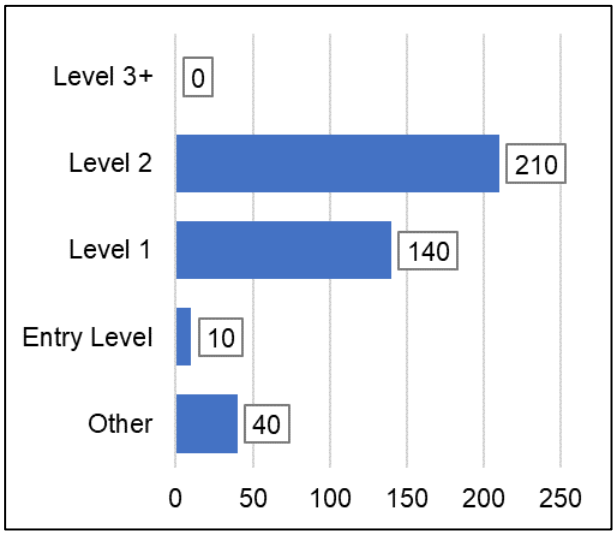
Approximately 38% of Manufacturing learners were Black/African/Caribbean/Black British which is significantly higher than the proportion of Black/African/Caribbean/Black British individuals in the population.

65% of Manufacturing learners were female and most were studying at Level 2. The new Level 3 entitlement provides an opportunity for more learners to progress to Level 3 and eventually to higher education.

Figure 106: AEB Manufacturing Technologies by Learner Characteristic 2019/20







Learning Aim Title AEB Funded Enrolments	Level	Size	18/19	19/20	20/21
Non regulated Community Learning provision, Manufacturing Technologies	Other	Unknown	170	50	10
Award in Fashion and Textiles	Level 1	Medium	100	50	40

PART SEVEN: OTHER GENERIC GREEN SKILLS

7.1 INTRODUCTION

This part of the report focuses on generic skills to support the move towards net zero which may be required by a wide range of businesses and citizens, but are not in themselves skills specific to a particular industrial sector. This includes project management, finance, retail, customer service and marketing. In addition, this section discusses the need for general 'green awareness' courses targeted at individuals as well as businesses.

7.2 PROJECT MANAGEMENT

The Green Jobs Taskforce report states that project managers will be needed across all industries in the transition to net zero to ensure timescales are managed and budgets are met. Fieldwork interviews with employers and employer bodies reinforced this point. For example, construction employers stressed the need for effective project management when carrying out retrofitting work.

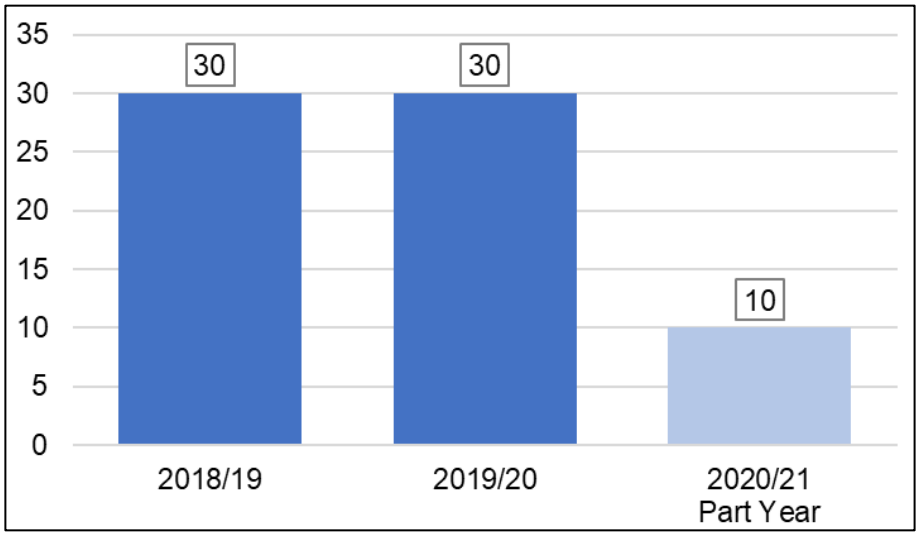
Details of Current AEB Provision

Project management is not a separate subject area nor do any courses have the word project management in the title. It is difficult therefore to quantify the extent to which the AEB is supporting the development of project management skills.

It is likely that project management skills are embedded within the curriculum. A search of the OFQUAL register for the key word of project management within the unit title identified a small number of learners who may have taken a module in this area.

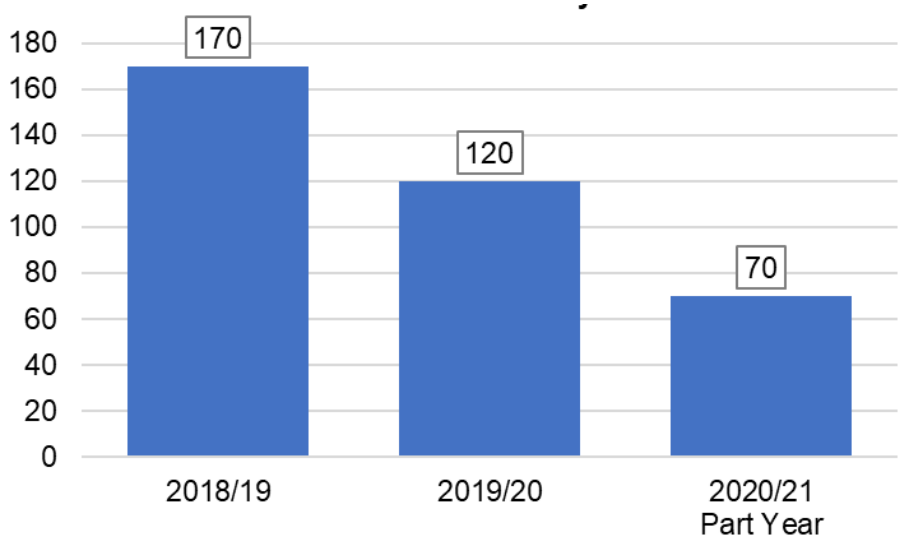
Within the Construction and the Built Environment subject area, for example, there were 30 learners in 2018/19 and 2019/20 potentially taking project management units dropping to 10 in 2020/21. All numbers in tables and charts are rounded to the nearest 10 for data protection purposes and this may lead to slight differences between totals.

Figure 107: AEB Learners – Project Management Modules - Construction



Within the Business Management subject area there were 170 learners in 2018/19, 120 learners in 2019/20 and 70 learners in 2020/21 potentially taking project management units.

Figure 108: AEB Learners – Project Management – Business Management



7.3 GREEN FINANCE

Green finance is one of a number of terms used to label activities related to the interaction between the environment and finance and investment. This includes the financing of sustainable development projects, environmental initiatives, pollution control, biodiversity and other developments supporting a green economy. There was little evidence that the AEB was supporting the development of these skills.

Interviews with employers also highlighted the need for individual businesses to be able to measure in financial terms their carbon footprint and the impact of saving energy, using renewable energy sources and reducing waste. This would require updated skills for accountants and other financial staff. One company that we spoke to has been heavily involved in supporting the hospitality sector to be more profitable by adopting green solutions, using a specifically designed software tool that helped quantify the financial impact of green solutions.

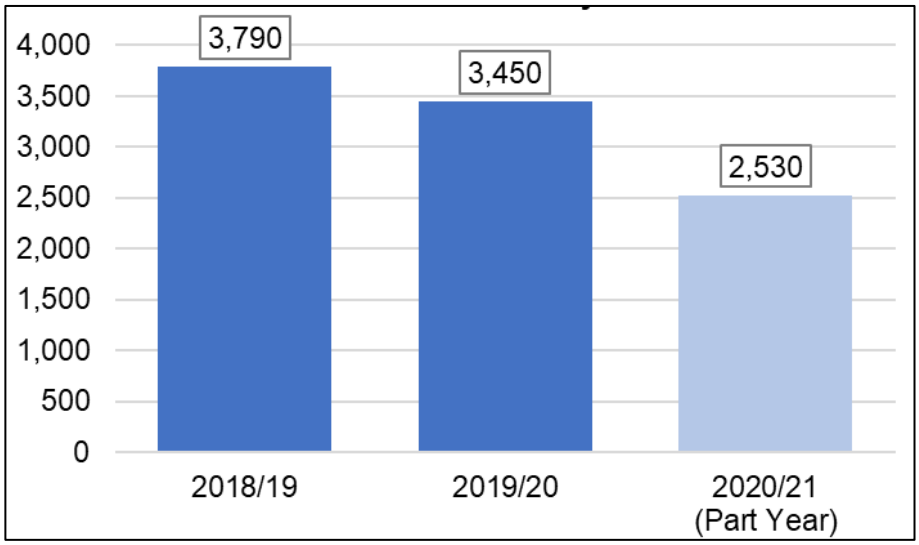
A growing number of employers are aware of their environmental responsibilities and are wanting to reduce their carbon footprint. However, many smaller businesses need support in knowing how to calculate their carbon footprint, establishing their current baseline and from then on managing its reduction. Many are seeking a cost benefit approach but need professional support to identify which areas of their business could make the biggest impact in reducing their carbon footprint whilst also ensuring any changes in business practices are affordable.

Details of Current AEB Provision

There are no current AEB courses directly related to green finance or carbon costing. However, within the AEB there are a significant number of learners studying learning aims under the subject area of 'Accounting and Finance' where this type of content could be included in the future. Over half of these learners were studying at Level 2 or above.

Figure 109 shows that in 2019/20 there were 3,450 learners taking AEB funded Accounting and Finance courses.

Figure 109: AEB Learners – Accounting and Finance



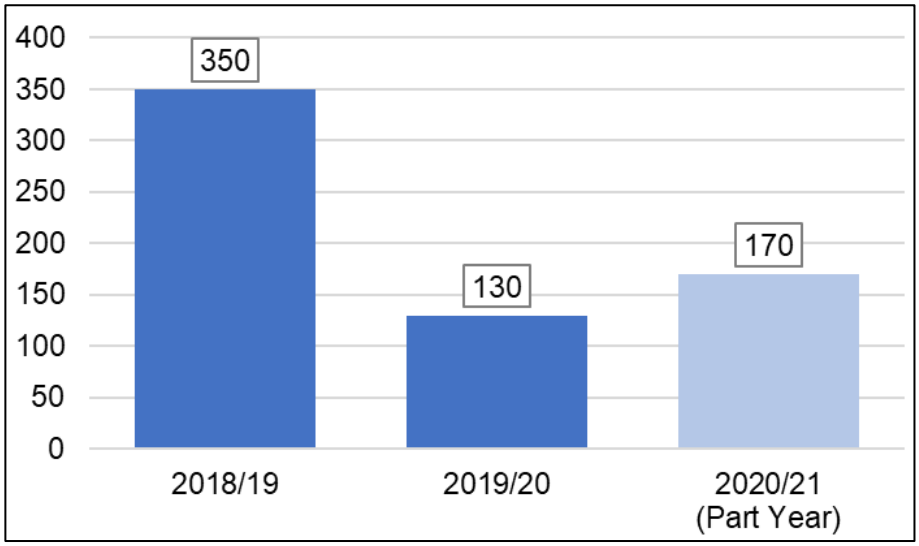
7.4 CUSTOMER SERVICE, MARKETING AND RETAIL

Employers in the construction and transport sectors felt that a successful transition to low carbon technologies such as heat pumps and electric vehicles would require significant changes in the skills required by individuals responsible for communicating with consumers. This includes customer service, marketing and retail skills.

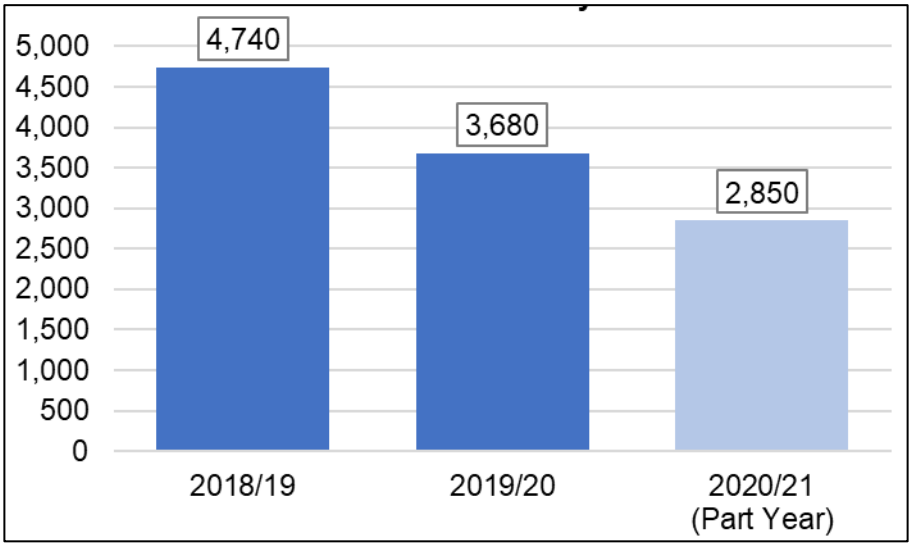
For example, employers in the automotive sector felt that there is a significant challenge and opportunity in educating consumers and boosting confidence in using electric vehicles and public EV charging points. Both manufacturers and dealerships are keen to give customers reassurance and support so they can make informed decisions when switching to an electric vehicle. This requires good sales and customer service skills together with an understanding of the strengths and weaknesses of the technology so that they can reassure customers.

Details of Current AEB Provision

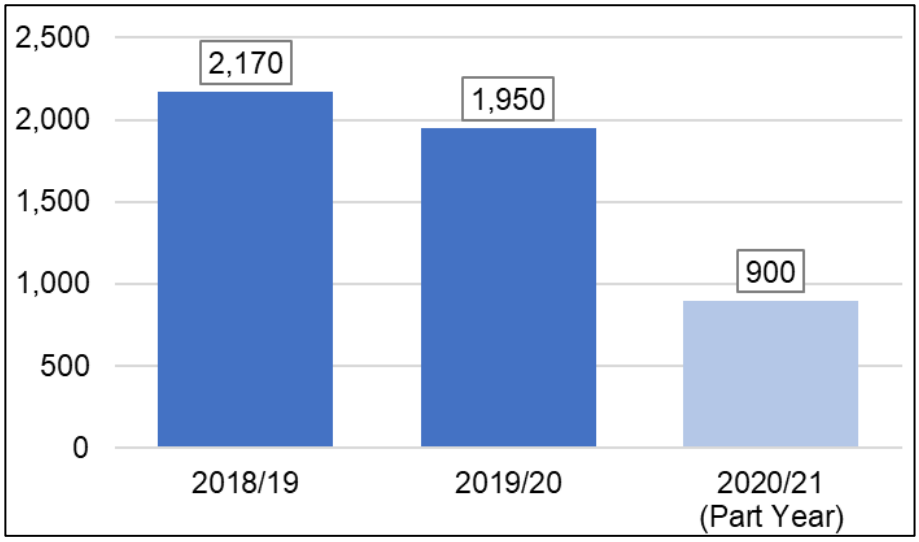
There were 350 learners in 2018/19 on learning aims classified under the subject area of Marketing and Sales. This dropped to 130 in 2019/20 with a slight rise to 170 in 2020/21. Much of this provision was delivered by Other Public Funded institutions under Community Learning.



Using a key word search on the title of the learning aim, 4,740 learners were identified on Customer Service courses in 2018/19. The number of learners dropped in 2019/20 to 3,680. In 2019/20 over half of learners (55%) were studying at a college while 40% were studying in at a Private Sector Public Funded Institution. Over half of learners where studying at Level 2.



Within the subject area of Retail and Wholesaling, there were 2,170 learners studying in 2018/19 which reduced to 1,950 learners in 2019/20. In 2020/21 there were 900 learners studying in this subject area. In 2019/20 94% of these learners were at Level 1.



7.5 GREEN AWARENESS

The previous sections of the report have focused on the skills needed to support green jobs, including both specialist sector specific skills and cross cutting skills. However, several interview respondents explained that transitioning towards net zero will require changes in behaviour from everybody including individual citizens. They felt that there was a real need for 'green awareness' courses that would help develop an understanding of why we need to move towards net zero, what would be the implications of these changes and how each individual can make a practical difference both at home and in their workplace. This would help to reduce waste, become more energy efficient and increase recycling. In the medium term it would also drive-up demand for green products and services such as electric cars and heat pumps (although other government initiatives would also be required).

A couple of organisations explained that giving individuals the tools to quantify low carbon behavioural changes and set targets and goals would provide motivation and increase long term impact both for themselves and the company they work for. We spoke, for example, to a company supporting the hospitality sector that ran courses for restaurants explaining the financial benefits of simple environmentally friendly changes like minimising food waste, using LED lights instead of halogens, effective use of heating controls, selection of ingredients, improving recycling and minimising the use of water. Another example was of quantifying the costs and benefits of using electric cars, taking into account savings in fuel, servicing and maintenance.

It was suggested that 'green awareness' should be thought of as a basic skill similar to digital literacy and should be a core part of the curriculum in all schools and colleges. This could be contextualised to the type of study that learners are undertaking. The Adult Education Budget funds a wide range of different qualifications and supports a diverse set of learners but a high proportion will be studying at Entry Level and Level 1. These individuals may be unemployed or have insecure jobs and 'green awareness' training alongside literacy, numeracy, digital and vocational skills could increase motivation and add value to their CV for a prospective employer.

PART EIGHT: CONCLUSIONS

8.1 SUMMARY OF KEY FINDINGS

The research study has provided a detailed analysis of how the Adult Education Budget in London is helping to develop the skills needed to achieve a low carbon economy. The project methodology involved analysis of key datasets and discussions with providers, employers, employer bodies, London Boroughs and membership bodies. Listed below are some of the key findings from the research.

AEB funded courses developing green skills

The AEB supports the green skills agenda in a range of different ways. Only a small number of AEB-funded learners are taking courses that are providing very specific green skills needed by the economy, such as installing heat pumps or EV charging points or supporting the development and maintenance of renewable energy sources. For example, in 2019/20 there were just 60 learners taking the Diploma in Refrigeration, Air Conditioning and Heat Pump Systems.

However, the AEB provides support for the green economy in other ways. Firstly, the research highlighted the need for an increasing number of general construction workers and electricians who have a wide range of skills to support the transition to a green economy. The AEB is currently supporting initial training in these areas with many of these individuals progressing into an apprenticeship.

Many AEB learners are also taking STEM qualifications such as digital technology, science and engineering. These 'enabling' skills are required in many different sectors including construction, transport, environment and energy, which have an important role to play in the green economy. Digital technology is seen by employers as a particularly vital tool for reducing carbon emissions.

The AEB also helps to develop skills in generic areas such as finance, project management, marketing, retail and customer service. Whilst these are not uniquely 'green skills,' expertise in these areas will be vital if a net zero economy is to be realised. Employers in the automotive industry, for example, felt that developing dealership customer service skills will be important in order to encourage the purchase of electric vehicles. Construction employers stressed the importance of project management in the retrofitting of buildings.

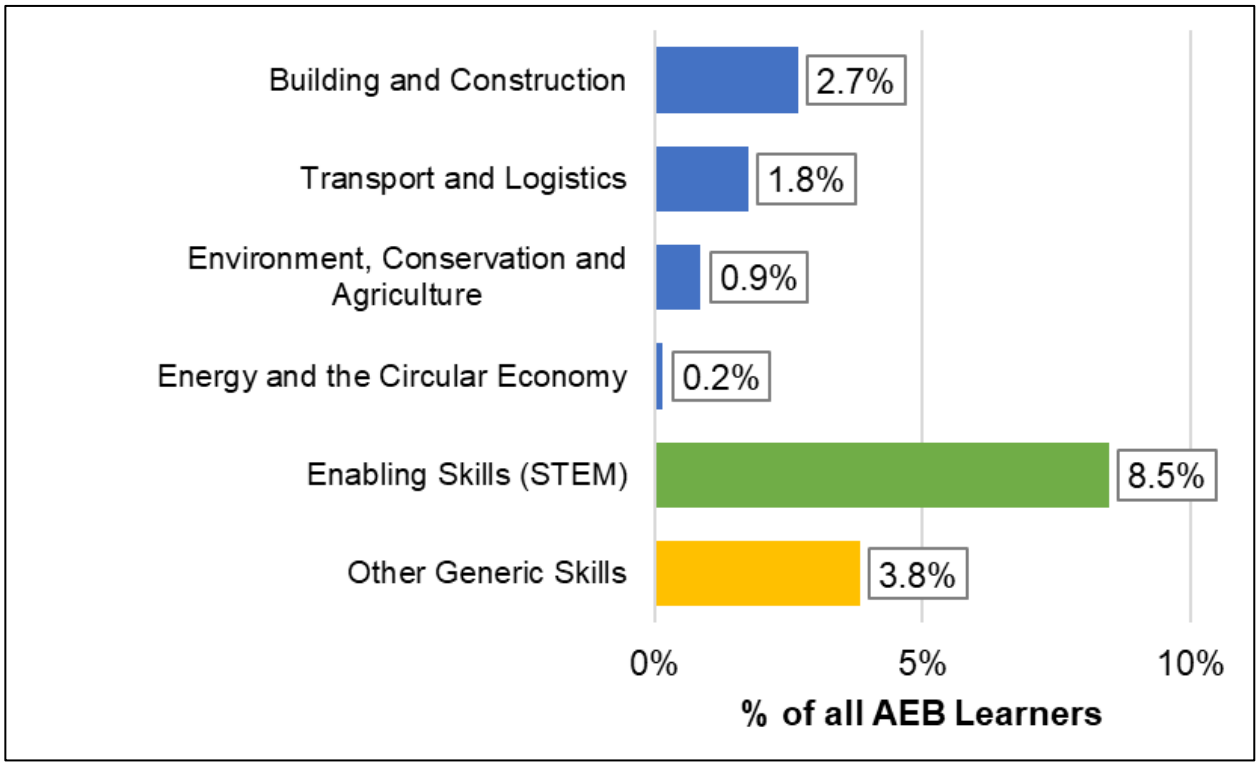
Figure 113 summarises the AEB-funded learner numbers in 2019/20 by skill category and 'green occupation' category as identified by GLA Economics. It should be noted that some learners may appear in more than one category (e.g. they are taking both a Building course and an IT user course). In total around 40,000 learners (out of 213,000 total AEB-funded learners) were taking green-relevant courses of which around 10,000 were taking qualifications specifically focused on green sectors of the economy and less than half of these were training in areas where green skills were a major focus (e.g. plumbers, electricians, conservation & environmental jobs).

Figure 114 shows the percentage of all AEB-funded learners by skill category. Building and Construction learners are less than 3% of all AEB learners and Energy less than 0.2%. Enabling skills and generic skills however account for over 10% of all AEB-funded learners.

Figure 113: Summary of AEB Funded Learner Numbers on Courses Relevant to Green Skills

Section/Occupation	Green Category	2019/20
BUILDING AND CONSTRUCTION		**5,740**
Plumbers and heating and ventilation engineers	Green Enhanced Skills	1,080
Elementary construction occupations	Green Enhanced Skills	450
Electricians and electrical fitters	Green Increased Demand	1,260
Steel erectors	Green Increased Demand	90
Construction and building trades	Green Increased Demand	760
Carpenters and joiners	Green Increased Demand	310
Construction operatives	Green Increased Demand	1,940
TRANSPORT AND LOGISTICS		**3,760**
Transport and distribution clerks and assistants	Green Enhanced Skills	950
Vehicle technicians, mechanics and electricians	Green Enhanced Skills	580
Large goods vehicle drivers	Green Enhanced Skills	10
Road construction operatives	Green Increased Demand	10
Rail construction and maintenance operatives	Green Increased Demand	520
Elementary storage occupations	Green Increased Demand	640
Electrical and electronic technicians	Green New and Emerging	1,260
ENVIRONMENT, CONSERVATION AND AGRICULTURE		**1,850**
Horticulture trades	Green Increased Demand	1,130
Agricultural and Fishing Trades n.e.c.	Green Increased Demand	10
Forestry workers	Green Increased Demand	40
Conservation & environmental associate professional	Green Increased Demand	370
Gardeners and landscape gardeners	Green Increased Demand	340
Refuse and salvage occupations	Green New and Emerging	20
ENERGY AND THE CIRCULAR ECONOMY		**350**
Energy Plant Operatives	Green New and Emerging	330
Other Energy Courses		20
ENABLING SKILL (STEM)		**18,120**
ICT for Practitioners		2,170
ICT for Users		12,940
Engineering		1,050
Science		1,820
Manufacturing		400
OTHER GENERIC SKILLS		**8,190**
Project Management - Construction		30
Project Management - Management		120
Accounting and Finance		3,450
Marketing and Sales		130
Customer Service		3,680
Retail and Wholesaling		1,950

Figure 114: Percentage of AEB Learners by Green Category 2019/20



Course Content Related to Green Skills

The research reviewed course and module content for some of the most popular qualifications in key green sectors. Green and sustainability issues were sometimes mentioned but this was often a small element of the course and the level of detail that would be covered was unclear. In many cases qualifications were felt by employers and providers to be rather traditional and were not reflecting the latest green requirements.

Characteristics of Learners Taking Green Skills Courses

The characteristics of learners varied by sector but in general 'green skills' courses[24] attracted a higher proportion of male learners than other AEB-funded courses (51% compared to 30%), but a similar proportion to the population of all 19+ London residents (Figure 115).

Courses relevant to green skills also attracted a higher proportion of ethnic minorities and learners from deprived postcodes compared to other AEB funded courses and the population of 19+ London residents (figures 116 and 117). The proportion of learners on courses relevant to green skills who were classified as White was 40% compared to 60% for all 19+ London residents. Approximately 25% of learners taking courses relevant to green skills lived in the most deprived quintile in England, compared to just 16% of 19+ London residents.

Learners were predominately studying at Level 2 and below and many learners will have had few prior qualifications before taking the course. AEB-funded green skills courses include both short courses for employed adults and initial training qualification for young adults starting out on their career.

[24] Includes Enabling and Generic Skills as defined in Figure 113

Figure 115: Percentage of Learners by Sex 2019/20

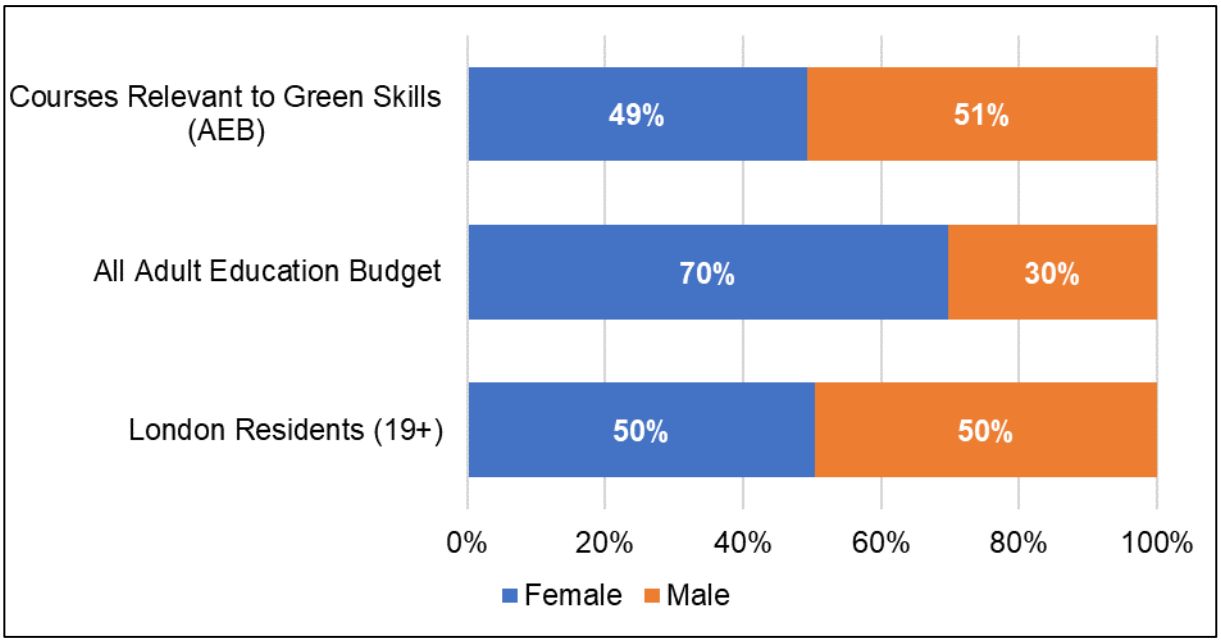


Figure 116: Percentage of Learners by Ethnicity 2019/20

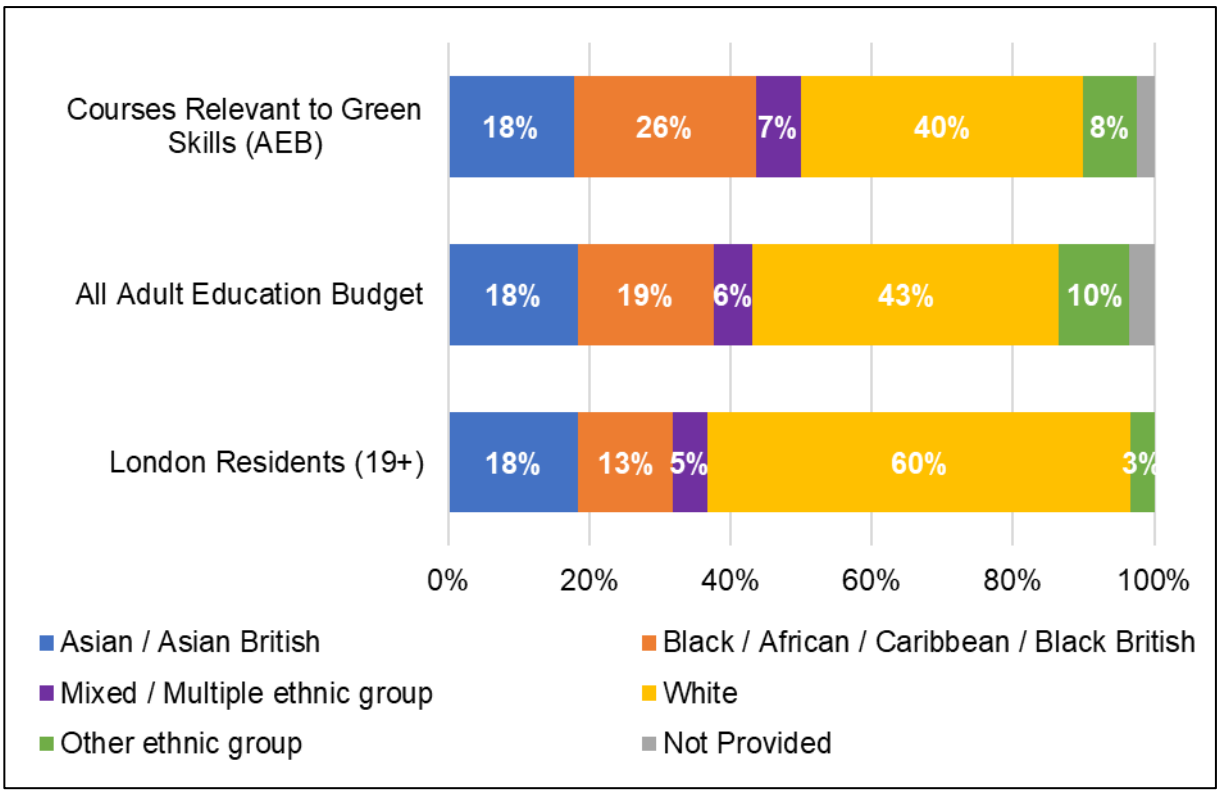
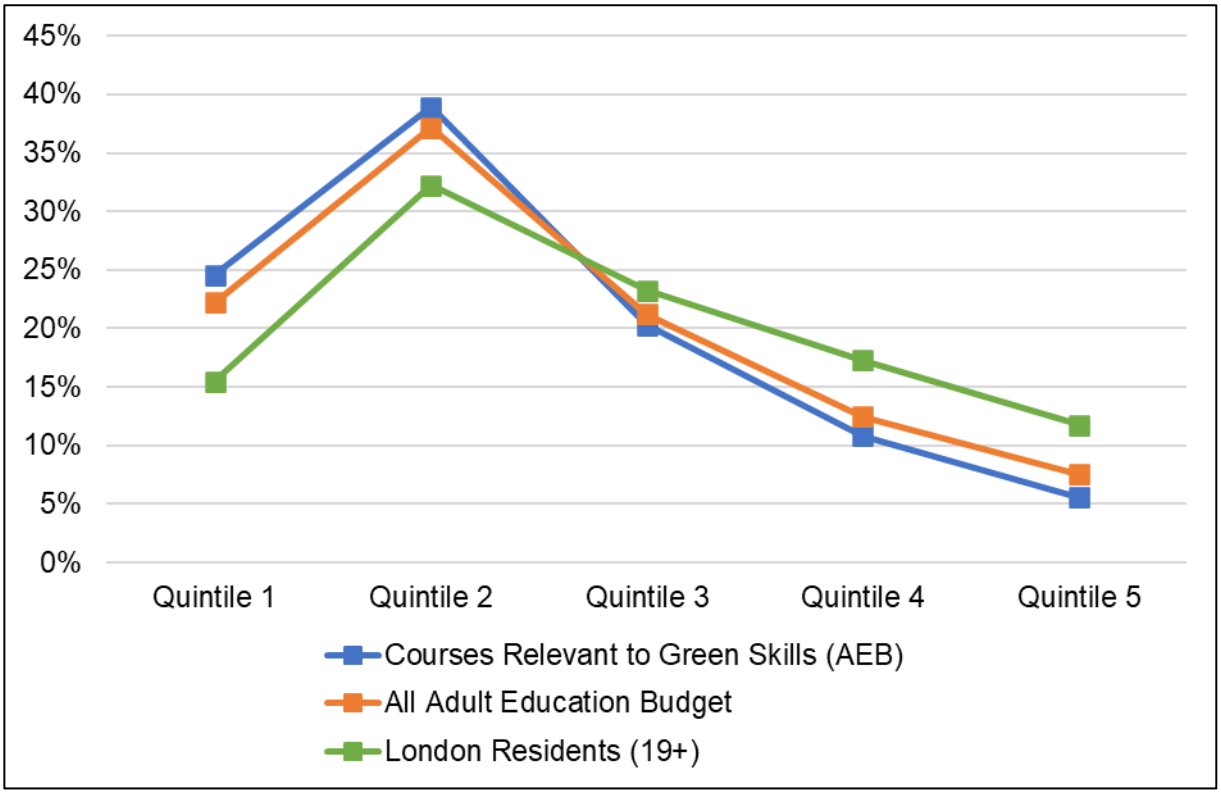


Figure 117: Percentage of Learners by Deprivation 2019/20



AEB Progression Pathways

Apprenticeships appear to provide the most popular progression pathways in Building and Construction and in Transport. Apprenticeship Standards are very occupationally specific, and a number are related directly to green jobs e.g. Refrigeration, Air Conditioning & Heat Pump Engineering Technician and Water Environment Worker. In Science and IT (Practitioner) the most popular progression route is into higher education. This is often funded by an FE Loan and includes courses such as an HE Access Programme.

However, AEB progression pathways do not appear to be fully developed in all areas and often there is no clear route through to higher levels of study. This is partly due to historical funding rules for AEB which prioritised the funding of courses below Level 3. Recent GLA AEB rule changes and the new DfE Level 3 entitlement provides an opportunity to develop more explicit progression pathways from the AEB to higher education.

Employers in all sectors felt that it was important to focus the AEB on developing long-term career pathways for individuals with a broad range of skills rather than short-term jobs for particular 'green' tasks (such as installing masts for EV charge points). This would help provide routes to good sustainable employment for the most disadvantaged individuals in London.

Many green skills technical updating courses are delivered commercially at full cost rather than through the AEB. For example, City and Guilds offers a range of short courses for trained electricians in installing EV chargers. However, it is difficult to establish the scale and scope of this type of provision as it does not appear on any public dataset.

Barriers to Developing Green Skills

Discussions with providers, employers and awarding organisations highlighted several barriers to developing green skills. These included:

- The accreditation of new AEB fundable qualifications is often a lengthy and time-consuming process and not felt to be responsive to the needs of employers and providers. There were several examples of colleges developing bespoke full cost provision for employers as existing publicly funded qualifications were not appropriate. Awarding organisations are keen to work with the GLA, employers and providers to develop new qualifications and have enormous experience in this area.

- The uptake of skills is hampered by a lack of demand for important green products and services such as heat pumps, electric cars and hydrogen technology. Employers and providers are waiting for Government action to incentivise the market before investing heavily in this area.

- Green skills were felt to be poorly defined and poorly understood by many employers and individuals. Whilst most people were supportive of the need to move towards a net zero economy it was not clear what practical actions needed to be taken and by whom. It was felt that simple, clear communication was required. Many businesses were focusing on immediate issues and did not see the need to invest in green skills at this time. This was particularly the case with small businesses.

- Many teaching staff have not kept up to date with the latest developments and would find it difficult to integrate green issues into their teaching. Staff development was seen to be a priority.

RECOMMENDATIONS

Recommendation 1: The GLA to facilitate partnerships between employers, providers and awarding organisations to support the delivery of green skills, including through the Mayor's Academies Programme

The research project found that employers, providers and awarding organisations were positive about the need to develop green skills. However, development of green skills within courses funded by the Adult Education Budget was often patchy and it was unclear how future developments in this area would be coordinated.

The GLA should seek to encourage partnerships between employers, providers and awarding organisations that have a focus on delivering green skills for London residents, including through the Mayor's Academies Programme. Suggested priorities for the partnerships are listed in the recommendations below.

The Mayor's Construction Academy has already helped to develop partnerships in the Building and Construction sector. The launch of new Academies in Green Skills and Digital should provide partnership development opportunities in other green sectors with the potential to include awarding organisations and other stakeholders.

Recommendation 2: Employers to work with providers and other stakeholders to better define and develop suitable career and training pathways to progress into good quality 'green' jobs

Most of the AEB provision is at Level 2 and below whilst employers are reporting skill shortages at higher levels. The GLA has already introduced a number of flexibilities which can support a wider range of Londoners to access the AEB. Greater flexibility of funding rules provides an opportunity for partners to map out and develop career pathways allowing progression from Entry Level to higher education and into employment.

Developing green validated career pathways would involve reviewing and developing holistically both AEB-funded courses and higher technical qualifications, together with their associated curriculum content, to ensure that green skills within specific sectors are properly developed.

Employers in green sectors told us that new individuals entering the workforce will require a broad range of skills. Whilst there is a short term need for tasks such as installing EV charging points and heat pumps, these tasks need to be embedded within broader training pathways that provide long-term careers.

Recommendation 3: Awarding Organisations should develop flexible micro qualifications in 'green skills' for trained adults

Employers told us that meeting adult skills needs would benefit from a greater range of modular micro-qualifications that are delivered flexibly for existing employees. Although largely outside of the scope of the AEB, these micro-qualifications could be at all levels from Level 2 to Level 6 but should be part of a coherent package of continuing professional development. GLA facilitated partnerships could help to develop this type of flexible provision.

Recommendation 4: Providers should continue to support digital and STEM skills as part of meeting net zero goals

Employers across all sectors told us that digital and STEM skills were vital in moving towards a net zero economy. The skills required are at all levels with a particular requirement for programmers, data analysts and engineers. The AEB can provide both initial training (with progression pathways to higher education) and professional updating.

Recommendation 5: The sector should develop a coordinated green skills teacher training programme

Providers and employers felt that teacher training would be essential if the AEB was to be effective in developing green skills. Teacher training would need to be contextualised to specific industrial sectors and different learner groups. This could cover specific green skills requirements in areas such as construction and the environment as well as general green awareness training in other areas.

Recommendation 6: Providers and awarding bodies should embed green awareness across the adult curriculum

The research highlighted the need for general green awareness for all individuals. Whilst most people were supportive of moving towards a net zero economy, many were confused about what they could do personally to make a difference.

In 2019/20 over 200,000 people enrolled on AEB-funded courses, some or many of whom could have benefitted from accessing a short green awareness course or taster session. Such courses for individuals could help to raise awareness and improve understanding in measures that could help with creating a more sustainable environment. This could include a focus on areas such as waste reduction, recycling, adapting to climate change, carbon footprint calculations, renewable energy sources, EV benefits etc. The GLA could support this development by communicating the value of green awareness courses to London residents.

Teaching staff should also be encouraged to develop examples related to sustainability and low carbon within their teaching, across all subject areas. This could include basic skills and ESOL provision which is the largest AEB-funded subject area. This would help to raise green awareness and encourage progression into green vocational areas.

Recommendation 7: The GLA should continue to actively promote the Importance of green skills to help support the ambition of growing London's green economy

The GLA should help to promote green skills through its communications and marketing channels. In particular, it should develop a series of case studies of learners who are employed in green areas of the economy and use these to encourage other adults to take up courses, helping them to progress into jobs in these sectors. The GLA should also help to promote participation in green skills courses through careers advice and guidance services.

Employers and providers felt that London's government had an important role to play in promoting green skills qualifications by stimulating demand for green job creation and supporting skills supply, including through its network of suppliers and subcontractors. This could involve, for example, the development of procurement standards that helped increase the demand for green skills qualifications.

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ANNEX A

SOURCES OF DATA AND DATA METHODOLOGY

Data Sources

The data sources used within this report:

- Individualised Learner Record 2018/19 (R14), 2019/20 (R14) & 2020/21 (R06)
- English indices of deprivation 2019 - Index of multiple deprivation https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019
- Number of Apprenticeship Starts 2020/21– Explore Educational Statistics https://explore-education-statistics.service.gov.uk/
- National Skills Fund: List of free level 3 qualifications available to eligible adults https://www.gov.uk/government/publications/find-a-free-level-3-qualification/list-of-free-level-3-qualifications-available-to-eligible-adults

The Individualised Learner Record included the following filters:

- Learner living within Greater London (if recorded, based on the learners home postcode at start of learning otherwise based on learners home location prior to learning)
- Active within the academic year
- The Adult Education Budget includes Community Learning

Key words used for the mapping exercise

This list of key words below was used to assist the mapping exercise to the various Green Categories. Not all words were found during the mapping exercise.

Category	Key words
Building and Construction	Plumbing, Electricians, Electrical, Carpentry, Joinery, Wood, Formwork, Steel, Roof, Construction, Heat Pump, Retrofit, Heat networks[25], Hydrogen Boilers, Fenestration, Cavity Wall, Concrete, Heating, Building.
Transport and Logistics	Transport, Road, Rail, Distribution, Highways, Vehicle, Logistics, Supply Chain, Roadbuilding, Track Maintenance, Driving Goods Vehicles, EV, Electric Cars.
Environment, Conservation and Agriculture	Garden, Agriculture, Horticulture, Countryside, Land, Wildlife, Land-Based, Tree, Arboriculture, Recycling, Waste, Fish, Livestock, Environment, Planting, Pollution, Propagation.
Energy and the Circular Economy	Energy, Renewable, Wind, Solar, Tidal, Hydro, Nuclear, Geothermal, Power, Biomass, Carbon Capture, Carbon Finance, Photovoltaic, Smart Meter.

[25] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/919521/heat-network-skills-review.pdf

ANNEX B

ORGANISATIONS PARTICIPATING IN THE RESEARCH

The following education providers, employer organisations and awarding organisations participated in the study. One of more of their representatives was interviewed. We thank everyone for their assistance with the study.

Hounslow Borough Council
London South East College
Barking & Dagenham College
Capel Manor College
Mayor's Construction Academy
London Councils
Waltham Forest College
Waltham Forest Borough Council
Enfield Borough Council
Haringey Borough
London South Bank University
Lambeth College (via London South Bank University)
Mayor's Construction Academy
Society of Motor Manufacturers and Traders
SSE Enterprise
WISE Campaign
British Association of Landscape Industries
ReLondon
CITB
CBI
City & Guilds
Imperial College, London
Ubitricity
Pedal Me
ACE Research
WPI Economics
The Chartered Institution of Water and Environmental Management
Fifty Shades of Greener
Thames Water
City of London Borough Council
Islington Council
NCFE
Trade Union Congress
Parks for London
Gateway Qualifications
Transport for London

ANNEX C

NATIONAL SKILLS FUND COURSES

BUILDING AND CONSTRUCTION

Plumbing and Heating Ventilation Engineers

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma In Plumbing Foundation	BPEC Certification Ltd	vocationally-related qualification
Level 3 NVQ Diploma in Domestic Plumbing & Heating (Gas Fired Water & Central Heating Appliances)	City & Guilds of London Institute	occupational qualification
Level 3 NVQ Diploma in Domestic Plumbing and Heating	City & Guilds of London Institute	occupational qualification
Level 3 Advanced Technical Diploma in Plumbing (450)	City & Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in Gas Utilisation Installation & Maintenance: Water Heating & Wet Central Heating	City & Guilds of London Institute	occupational qualification
Level 3 Certificate in Bathroom Installation Skills	Open College Network West Midlands	occupational qualification

Electricians and Electrical Fitters

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced Technical Diploma in Electrical Installation (450)	City & Guilds of London Institute	vocationally-related qualification
Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	City & Guilds of London Institute	occupational qualification
Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	Excellence, Achievement & Learning Limited	occupational qualification
Level 3 Advanced Diploma in Electrical Installation	Excellence, Achievement & Learning Limited	vocationally-related qualification

Carpenters and Joiners

Qualification title	Awarding organisation	Qualification type
Level 3 NVQ Diploma in Wood Occupations (Construction)	City & Guilds of London Institute	occupational qualification
Level 3 Advanced Technical Diploma in Site Carpentry (450)	City & Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in Bench Joinery (Construction)	NOCN	vocationally-related qualification
Level 3 Diploma in Site Carpentry (Construction)	NOCN	vocationally-related qualification
Level 3 NVQ Diploma in Wood Occupations (Construction)	NOCN	occupational qualification
Level 3 Advanced Technical Diploma in Architectural Joinery (450)	City & Guilds of London Institute	vocationally-related qualification

Other Construction and Building Trades

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in the Built Environment with Building Information Modelling	Gateway Qualifications Limited	vocationally-related qualification
Level 3 NVQ Diploma in Accessing Operations and Rigging (Construction) (added July 2021)	NOCN	occupational qualification
Level 3 Diploma in Advanced Land Drilling	NOCN	other vocational qualification
Level 3 NVQ Diploma in Demolition (Construction)	NOCN	occupational qualification
Level 3 NVQ Diploma in Formwork	NOCN	occupational qualification
Level 3 NVQ Diploma in Interior Systems - Ceiling Fixing (Construction)	NOCN	occupational qualification
Level 3 NVQ Diploma in Roofing Occupations (Construction)	NOCN	occupational qualification
Level 3 NVQ Diploma in Site Inspection	NOCN	occupational qualification
Level 3 NVQ Diploma in Testing, Inspecting and thorough Examination Occupations (Construction) - Dynamic Pile Testing	NOCN	occupational qualification
Level 3 NVQ Diploma in Testing, Inspecting and thorough Examination Occupations (Construction) - Installing Construction Anchors and Site Testing of Construction Fixings	NOCN	occupational qualification

Level 3 NVQ Diploma in Testing, Inspecting and thorough Examination Occupations (Construction) - Leak Detection in Waterproof Systems	NOCN	occupational qualification
Level 3 NVQ Diploma in Testing, Inspecting and thorough Examination Occupations (Construction) - Testing, Inspecting and thorough Examination of Plant, Machinery, Equipment or Accessories	NOCN	occupational qualification
Level 3 NVQ Diploma in Tunnelling Operations - Tunnel Boring Machine Operator (Construction)	NOCN	occupational qualification
Level 3 Certificate in Building, Installation and Property Maintenance Skills	Open College Network West Midlands	occupational qualification
Level 3 Certificate in Kitchen Installation Skills	Open College Network West Midlands	occupational qualification
BTEC Level 3 National Diploma in Building Services Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Civil Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Construction and the Built Environment	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Building Services Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Civil Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Construction and the Built Environment	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Foundation Diploma in Construction and the Built Environment	Pearson Education Ltd	vocationally-related qualification
Level 3 NVQ Diploma in Accessing Operations and Rigging	Pearson Education Ltd	occupational qualification
Level 3 NVQ Diploma in Occupational Work Supervision (Construction)	Pearson Education Ltd	occupational qualification
Level 3 Diploma In Thermal Insulation	Scottish Qualifications Authority trading as SQA	occupational qualification
Level 3 Diploma for Designing, Engineering and Constructing a Sustainable Built Environment	The Learning Machine	vocationally-related qualification
Level 3 Certificate in Design, Engineer, Construct! The Digital Built Environment (RQF)	Training Qualifications UK Ltd	vocationally-related qualification
Level 3 Diploma in Design, Engineer, Construct! The Digital Built Environment (RQF)	Training Qualifications UK Ltd	vocationally-related qualification

TRANSPORT AND LOGISTICS

Transport and distribution clerks and assistants

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in Logistics	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in International Supply Chain Logistics (RQF)	Open Awards	other vocational qualification
Level 3 Extended Diploma in International Supply Chain Logistics (RQF)	Open Awards	other vocational qualification

Vehicle technicians, mechanics and electricians

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in Light Vehicle Maintenance and Repair Principles	City & Guilds of London Institute	vocationally-related qualification
BTEC Level 3 Extended Diploma in Vehicle Technology (QCF)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 Subsidiary Diploma in Vehicle Technology (QCF)	Pearson Education Ltd	vocationally-related qualification
Level 3 Diploma in Heavy Vehicle Maintenance and Repair Principles (VRQ) (added July 2021)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Auto-Electrical and Mobile Electrical Operations (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Heavy Vehicle Maintenance (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Light Vehicle Maintenance (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Light Vehicle Maintenance and Repair Principles (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Motorcycle Maintenance (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Motorcycle Maintenance and Repair Principles (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Vehicle Accident Repair - Body (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Vehicle Accident Repair - Multi-Skilled (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Vehicle Accident Repair - Paint (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Vehicle Accident Repair Paint Principles (VRQ)	The Institute of the Motor Industry	vocationally-related qualification

Level 3 Extended Diploma in Light Vehicle Maintenance (VRQ)	The Institute of the Motor Industry	vocationally-related qualification

Rail construction and maintenance operatives

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in Rail Engineering Technician Competence	City & Guilds of London Institute	vocationally-related qualification

Elementary storage occupations

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in Warehousing and Storage (RQF)	Highfield Qualifications	occupational qualification

Electrical and electronics technicians

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced Technical Diploma in Electrical Installation (450)	City & Guilds of London Institute	vocationally-related qualification
Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	City & Guilds of London Institute	occupational qualification
Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)	Excellence, Achievement & Learning Limited	occupational qualification
Level 3 Advanced Diploma in Electrical Installation	Excellence, Achievement & Learning Limited	vocationally-related qualification

ENVIRONMENT, CONSERVATION AND AGRICULTURE

Conservation and environmental associate professionals

Qualification title	Awarding organisation	Qualification type
BTEC Level 3 Certificate in Environmental Sustainability (QCF)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Countryside Management	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Certificate in Countryside Management	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Countryside Management	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Foundation Diploma in Countryside Management	Pearson Education Ltd	vocationally-related qualification

Horticultural trades

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced Technical Diploma in Horticulture (540) (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Advanced Technical Extended Diploma in Horticulture (1080) (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in Work-based Horticulture (added July 2021)	City and Guilds of London Institute	occupational qualification
BTEC Level 3 National Diploma in Horticulture	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Extended Certificate in Horticulture	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Horticulture	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Foundation Diploma in Horticulture	Pearson Education Ltd	vocationally-related qualification

Gardeners and landscape gardeners

Qualification title	Awarding organisation	Qualification type
Level 3 Certificate in Landscape Construction	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Landscape Construction	Gateway Qualifications Limited	vocationally-related qualification

Agricultural and fishing trades n.e.c

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced Technical Diploma in Agriculture (540)	City & Guilds of London Institute	vocationally-related qualification
Level 3 Advanced Technical Extended Diploma in Agriculture (1080)	City & Guilds of London Institute	vocationally-related qualification
BTEC Level 3 National Diploma in Agriculture	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Certificate in Agriculture	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Agriculture	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Foundation Diploma in Agriculture	Pearson Education Ltd	vocationally-related qualification

Forestry workers

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture (1080) (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 90-Credit Diploma in Forestry and Arboriculture (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in Forestry and Arboriculture (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Forestry and Arboriculture	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Foundation Diploma in Forestry and Arboriculture	Pearson Education Ltd	vocationally-related qualification

ENERGY AND THE CIRCULAR ECONOMY

Qualification title	Awarding organisation	Qualification type
Level 3 Certificate in Nuclear Engineering & Science (RQF)	Engineering Construction Industry Training Board	vocationally-related qualification
Level 3 Diploma in Nuclear Engineering & Science (RQF)	Engineering Construction Industry Training Board	vocationally-related qualification

ENABLING SKILLS (STEM)

Digital

Qualification title	Awarding organisation	Qualification type
BTEC Level 3 National Extended Diploma in Computing (added July 2021)	Pearson Education Ltd	vocationally-related qualification
Level 3 Certificate in IT User Skills (ECDL Advanced) (ITQ)	BCS, The Chartered Institute for IT	vocationally-related qualification
Level 3 Advanced GCE in Computer Science	AQA Education	GCE A Level
Level 3 Advanced Subsidiary GCE in Computer Science	AQA Education	GCE AS Level
Level 3 Diploma in Information and Digital Technologies	ATHE Ltd	vocationally-related qualification
Level 3 Diploma in ICT Systems Support (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in ICT Professional Competence (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Certificate in Digital Engineering Design	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Certificate in Digital Product Design	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Certificate in Networking and Cybersecurity	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Certificate in Software Development	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Certificate in Systems Infrastructure	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Digital Engineering Design	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Digital Product Design	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Networking and Cybersecurity	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Software Development	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Systems Infrastructure	Gateway Qualifications Limited	vocationally-related qualification
Level 3 Diploma in Computing	NCC Education Limited	other general qualification
Level 3 Certificate in Coding Practices	NCFE	vocationally-related qualification

Level 3 Certificate in Cyber Security Practices	NCFE	vocationally-related qualification
Level 3 Advanced GCE in Computer Science	OCR	GCE A Level
Level 3 Advanced Subsidiary GCE in Computer Science	OCR	GCE AS Level
Level 3 Cambridge Technical Diploma in IT	OCR	occupational qualification
Level 3 Cambridge Technical Extended Diploma in IT	OCR	occupational qualification
Level 3 Cambridge Technical Foundation Diploma in IT	OCR	other general qualification
Level 3 Cambridge Technical Introductory Diploma in IT	OCR	other general qualification
BTEC Level 3 National Certificate in Information Technology (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Certificate in Information Technology (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Foundation Diploma in Information Technology (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 Diploma in IT (QCF)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 Extended Diploma in IT (QCF)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Business Information Systems	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Computer Science	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Computer Systems and Network Support	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Computing for Creative Industries	Pearson Education Ltd	vocationally-related qualification
Level 3 Advanced GCE in Computer Science	WJEC-CBAC	GCE A Level
Level 3 Advanced Subsidiary GCE in Computer Science	WJEC-CBAC	GCE AS Level

Engineering

Qualification title	Awarding organisation	Qualification type
BTEC Level 3 National Extended Certificate in Engineering (added July 2021)	Pearson Education Ltd	vocationally-related qualification
Level 3 Diploma in Engineering (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
BTEC Level 3 National Foundation Diploma in Engineering (added July 2021)	Pearson Education Ltd	vocationally-related qualification
Level 3 Advanced Technical Certificate In Engineering	City & Guilds of London Institute	vocationally-related qualification
Level 3 Advanced Technical Extended Diploma in Engineering (720)	City & Guilds of London Institute	vocationally-related qualification
Level 3 Award in Advanced Welding Skills	City & Guilds of London Institute	vocationally-related qualification
Level 3 Certificate in Nuclear Engineering & Science (RQF)	Engineering Construction Industry Training Board	vocationally-related qualification
Level 3 Diploma in Engineering Construction Lifting, Positioning and Installing Structures, Plant and Equipment (RQF)	Engineering Construction Industry Training Board	occupational qualification
Level 3 Diploma in Engineering Construction Maintenance (RQF)	Engineering Construction Industry Training Board	occupational qualification
Level 3 Diploma in Engineering Design and Draughting (RQF)	Engineering Construction Industry Training Board	occupational qualification
Level 3 Diploma in Installing Engineering Construction Plant and Systems (RQF)	Engineering Construction Industry Training Board	occupational qualification
Level 3 Diploma in Nuclear Engineering & Science (RQF)	Engineering Construction Industry Training Board	vocationally-related qualification
Level 3 Diploma in Project Controls Practice and Techniques (RQF)	Engineering Construction Industry Training Board	occupational qualification
Level 3 Advanced Diploma in Electrical Installation	Excellence, Achievement & Learning Limited	vocationally-related qualification
Level 3 Advanced Diploma in Engineering Technology	Excellence, Achievement & Learning Limited	vocationally-related qualification
Level 3 Diploma In Engineering Technologies	Excellence, Achievement & Learning Limited	vocationally-related qualification
Level 3 Diploma in Engineering Technology	Excellence, Achievement & Learning Limited	vocationally-related qualification
Level 3 Subsidiary Diploma in Engineering Technologies	Excellence, Achievement & Learning Limited	vocationally-related qualification

Level 3 Technical Extended Diploma in Engineering Technologies	Excellence, Achievement & Learning Limited	vocationally-related qualification
Level 3 Diploma for Commercial Locksmiths and Property Security (RQF)	Highfield Qualifications	vocationally-related qualification
Level 3 Cambridge Technical Diploma in Engineering	OCR	occupational qualification
Level 3 Cambridge Technical Extended Diploma in Engineering	OCR	occupational qualification
Level 3 Cambridge Technical Foundation Diploma in Engineering	OCR	other general qualification
BTEC Level 3 Extended Diploma in Blacksmithing and Metalworking (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 Diploma in Blacksmithing and Metalworking (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)	Pearson Education Ltd	occupational qualification
BTEC Level 3 Diploma in Aerospace and Aviation Engineering (Development Technical Knowledge)	Pearson Education Ltd	occupational qualification
BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)	Pearson Education Ltd	occupational qualification
BTEC Level 3 Extended Diploma in Aerospace and Aviation Engineering (Development Technical Knowledge)	Pearson Education Ltd	occupational qualification
BTEC Level 3 National Diploma in Aeronautical Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Electrical and Electronic Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Manufacturing Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Diploma in Mechanical Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Aeronautical Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Computer Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Electrical and Electronic Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Engineering	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Extended Diploma in Manufacturing Engineering	Pearson Education Ltd	vocationally-related qualification

BTEC Level 3 National Extended Diploma in Mechanical Engineering	Pearson Education Ltd	vocationally-related qualification
Level 3 Certificate in Fabrication and Welding Techniques and Skills	Skills and Education Group Awards	vocationally-related qualification
Level 3 Certificate in Welding Techniques and Skills	Skills and Education Group Awards	vocationally-related qualification
Level 3 Diploma in Fabrication and Welding Techniques and Skills	Skills and Education Group Awards	vocationally-related qualification
Level 3 Diploma in Welding Techniques and Skills	Skills and Education Group Awards	vocationally-related qualification
Level 3 Diploma in Motorsport Vehicle Maintenance and Repair (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Extended Diploma in Motorsport Maintenance (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Extended Diploma In Motorsport Vehicle Maintenance and Repair (VRQ)	The Institute of the Motor Industry	vocationally-related qualification
Level 3 Diploma in Engineering (RQF)	Training Qualifications UK Ltd	occupational qualification
Level 3 Advanced GCE in Electronics	WJEC-CBAC	GCE A Level
Level 3 Advanced Subsidiary GCE in Electronics	WJEC-CBAC	GCE AS Level

Science

Qualification title	Awarding organisation	Qualification type
Level 3 Advanced GCE in Biology	AQA Education	GCE A Level
Level 3 Advanced GCE in Chemistry	AQA Education	GCE A Level
Level 3 Advanced GCE in Physics	AQA Education	GCE A Level
Level 3 Advanced Subsidiary GCE in Biology	AQA Education	GCE AS Level
Level 3 Advanced Subsidiary GCE in Chemistry	AQA Education	GCE AS Level
Level 3 Advanced Subsidiary GCE in Physics	AQA Education	GCE AS Level
Level 3 Advanced GCE in Biology A	OCR	GCE A Level
Level 3 Advanced GCE in Biology B (Advancing Biology)	OCR	GCE A Level
Level 3 Advanced GCE in Chemistry A	OCR	GCE A Level
Level 3 Advanced GCE in Chemistry B (Salters)	OCR	GCE A Level
Level 3 Advanced GCE in Physics A	OCR	GCE A Level
Level 3 Advanced GCE in Physics B (Advancing Physics)	OCR	GCE A Level
Level 3 Advanced Subsidiary GCE in Biology A	OCR	GCE AS Level
Level 3 Advanced Subsidiary GCE in Biology B (Advancing Biology)	OCR	GCE AS Level
Level 3 Advanced Subsidiary GCE in Chemistry A	OCR	GCE AS Level
Level 3 Advanced Subsidiary GCE in Chemistry B (Salters)	OCR	GCE AS Level
Level 3 Advanced Subsidiary GCE in Physics A	OCR	GCE AS Level
Level 3 Advanced Subsidiary GCE in Physics B (Advancing Physics)	OCR	GCE AS Level
BTEC Level 3 National Extended Certificate in Applied Science (added July 2021)	Pearson Education Ltd	vocationally-related qualification
BTEC Level 3 National Foundation Diploma in Applied Science (added July 2021)	Pearson Education Ltd	vocationally-related qualification

BTEC Level 3 National Extended Diploma in Applied Science (added July 2021)	Pearson Education Ltd	vocationally-related qualification
Level 3 Advanced GCE in Biology A (Salters-Nuffield)	Pearson Education Ltd	GCE A Level
Level 3 Advanced GCE in Biology B	Pearson Education Ltd	GCE A Level
Level 3 Advanced GCE in Chemistry	Pearson Education Ltd	GCE A Level
Level 3 Advanced GCE in Physics	Pearson Education Ltd	GCE A Level
Level 3 Advanced Subsidiary GCE in Biology A (Salters-Nuffield)	Pearson Education Ltd	GCE AS Level
Level 3 Advanced Subsidiary GCE in Biology B	Pearson Education Ltd	GCE AS Level
Level 3 Advanced Subsidiary GCE in Chemistry	Pearson Education Ltd	GCE AS Level
Level 3 Advanced Subsidiary GCE in Physics	Pearson Education Ltd	GCE AS Level
Level 3 Advanced GCE in Biology	WJEC-CBAC	GCE A Level
Level 3 Advanced GCE in Chemistry	WJEC-CBAC	GCE A Level
Level 3 Advanced GCE in Physics	WJEC-CBAC	GCE A Level
Level 3 Advanced Subsidiary GCE in Biology	WJEC-CBAC	GCE AS Level
Level 3 Advanced Subsidiary GCE in Chemistry	WJEC-CBAC	GCE AS Level
Level 3 Advanced Subsidiary GCE in Physics	WJEC-CBAC	GCE AS Level

Manufacturing Technologies

Qualification title	Awarding organisation	Qualification type
Level 3 Diploma in Furniture Design and Making (added July 2021)	City and Guilds of London Institute	occupational qualification
Level 3 Advanced GCE in Design and Technology: Fashion and Textiles	AQA Education	GCE A Level
Level 3 Advanced GCE in Design and Technology: Product Design	AQA Education	GCE A Level
Level 3 Advanced Subsidiary GCE in Design and Technology: Fashion and Textiles	AQA Education	GCE AS Level
Level 3 Advanced Subsidiary GCE in Design and Technology: Product Design	AQA Education	GCE AS Level
Level 3 Diploma in Jewellery and Silverware Manufacturing (added July 2021)	City and Guilds of London Institute	vocationally-related qualification
Level 3 Diploma in Food Technology (added July 2021)	FDQ Limited	vocationally-related qualification
Level 3 Diploma in Food Technology and Management (added July 2021)	FDQ Limited	vocationally-related qualification
Level 3 NVQ Diploma in Fenestration Installation	GQA Qualifications Limited	occupational qualification
Level 3 Advanced GCE in Design and Technology (Design Engineering / Fashion and Textiles / Product Design)	OCR	GCE A Level
Level 3 Advanced Subsidiary GCE in Design and Technology (Design Engineering / Fashion and Textiles / Product Design)	OCR	GCE AS Level
Level 3 Advanced GCE in Design and Technology (Product Design)	Pearson Education Ltd	GCE A Level
Level 3 Advanced GCE in Design and Technology (Fashion and Textiles/Product Design)	WJEC-CBAC	GCE A Level
Level 3 Advanced Subsidiary GCE in Design and Technology (Fashion and Textiles/Product Design)	WJEC-CBAC	GCE AS Level