JTL
POWERING APPRENTICESHIPS

Powering the future:

Securing a skilled electrical workforce to deliver growth

jtltraining.com

 Updated October 2025 to correct a design error in Graphs 2 and 3 (data unchanged).

Overview

The Government's targets on economic growth, housing, clean energy, and AI require a skilled and competent electrical workforce to realise these ambitions. From wiring safe data centres and powering up new businesses to kitting out new homes for families or enabling safe Electric Vehicle (EV) charging. Skilled electricians are a critical part of the workforce now and for the future.

However, not enough new electricians are entering the workforce to replace those leaving and more still are needed to ensure the government's 2030 targets on energy and housing are met. Alongside this, there must be a continued focus on the highest quality of training to ensure the safety and standards across construction and the built environment are maintained and workforce competence does not degrade.

This report outlines a new projection model, developed by JTL with industry partners, which focuses on England's electrical workforce, specifically the 'Electrician' occupation, over a 15-year horizon. It evaluates workforce size, skill level and the interplay between industry demand and the skills supply pipeline.

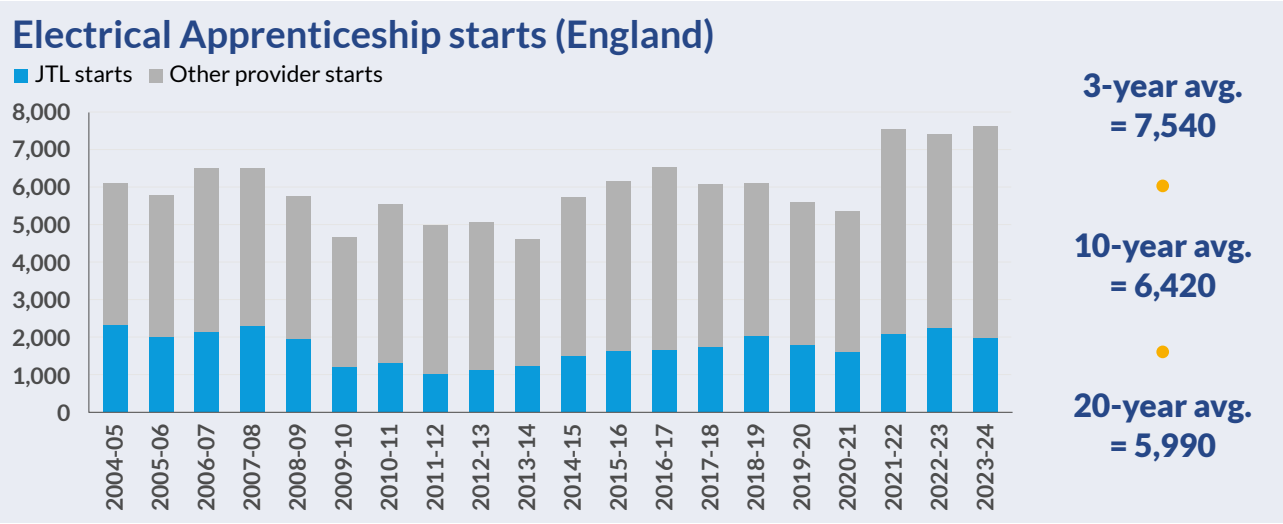
The UK faces a critical skills shortage in engineering and trade sectors, with 37% of engineering services companies citing labour shortages as their biggest concern[1]. Much of the current policy conversation around skills focuses solely on mismatches between current demand and supply, without factoring in the future demand created by major infrastructure projects, housing and clean energy commitments and the economic growth sectors identified in the Industrial Strategy. We urgently need to build in capacity to the electrical workforce, with apprenticeships already recognised as the gold standard route to occupational competence in this sector.

37%

of engineering services companies cite labour shortages as their biggest concern

To begin to halt the decline in the size of the workforce, over 10,000 electrical apprenticeship starts per year are needed. This is before the scale of new infrastructure projects is brought into consideration.

Between a quarter and a third of new electrical apprenticeship starts each year are with JTL:



Our report outlines the challenges for skills development and sets out recommendations to ensure the electrical skills pipeline is able to meet industry demand. We are committed to working with the Government, politicians, policymakers and across industry to secure the future of the electrical workforce.

[1] eca.co.uk/news/2025/mar/industry-survey-shows-growth-remains-flat-as-skill-shortages-and-volatile-pricing-persist

Key findings

Workforce Challenges

- **The electrical workforce (ONS) has declined by 26.2% since 2018,** with outflows surpassing inflows despite recent increases in apprenticeship starts and increases in those qualifying via the Experienced Worker Route (EWR) and NVQ routes.

- **Current policy overlooks future demands** created by the Government's plans for major infrastructure projects, housing development, and clean energy commitments, necessitating significant workforce expansion.

- A shrinking, stagnant or less competent electrical workforce could impose a ceiling on economic output, limiting growth and productivity. Without targeted interventions to recruit and retain new talent, **the sector risks skill shortages, rising project costs, and constraints on infrastructure development,** all of which could hinder broader economic progress.

- The composition of the electrical workforce differs from many other occupations in several ways. Notably, there is a high prevalence of SMEs and business to business sub-contracting activity; the workforce includes high proportions of self-employment and is inherently mobile in its day-to-day work; plus it operates across multiple industrial settings on safety critical work. These factors combine to **require careful management by employers and industry bodies.**

Skill Level and Quality

- Maintaining both workforce size and skill level requires significantly increasing capacity in the skills supply chain (i.e. the training provider, employer and apprentice tripartite partnership) and improving achievement rates without compromising safety standards. Based on current trajectory, **without further action the electrical workforce in England could decline a further 32% by 2038.**

- This projection model **highlights the interplay between workforce size and skilled person density** under various assumptions.

- Achieving both stability in workforce size and competence **requires over 10,000 annual apprenticeship starts per year in England** and sustained levels of certification via NVQ and experienced worker assessments.

Recommendations

Action is urgently needed to stop the decline of the electrical workforce and maintain competency. The consequences of inaction are the inability to meet Government targets, serve communities and create job opportunities for both current and future generations.

1. Boost collaboration across Government and between training providers, employers, national and regional policymakers and industry bodies.

Skills England should liaise with industry and across Government to publish clear targets for apprenticeship starts and other skills training routes across electrical and other priority sectors, as part of a robust post-16 Skills Strategy. This should be evidence-based in line with modelled demand for the skills needed considering current projects, retrofit ambitions and infrastructure commitments set out in the Industrial Strategy. Following this, a specific action plan is needed to increase the number of apprenticeship opportunities and starts in the electrical sector. For example, through targeted incentives to encourage employers in the electrical sector to hire more apprentices and boosting the uptake of electrical apprenticeships specifically with targeted marketing and communications campaigns led by employers, training organisations and industry bodies.

2. Sharpen the focus on apprenticeship achievement rates and volumes

Focusing on quality improvement to fully recognise and remove barriers to achievement would drive up achievement rates and, in turn, reduce the required number of starts. There can be no short-cuts or compromises on the quality of training in the rush to power up the electrical workforce because these are safety-critical occupations.

We strongly recommend against fast-track and unproven training routes. Learners undertaking classroom-based courses typically do not progress into the workforce. There are in the region of 25,000 enrolments annually onto publicly funded courses with progression from these into an apprenticeship standing at between 0% and 8% (all England). This represents very poor value for money.

The Government should closely monitor the electrical sector to reward consistently high achievement rates and step in where achievement rates are below expectations. Greater transparency and precision in publicly available data, such as further breaking down Qualification Achievement Rates (QAR) to version numbers of standards and reasons for non-completion, would support more insightful research, sophisticated analysis and lead to better, data driven, decision making. By targeting resources to those training programmes that directly input to the workforce, the Government can help ensure impact for industry.

Working towards continuous quality improvement in the apprenticeship provision as well as increased uptake and a proportional increase in conversion from NVQ/EWR, would better ensure the workforce skill level is able to meet industry demands.

3. Reform apprenticeship funding

Rising costs and the need for investment in new technologies to meet industry demand are straining apprenticeship delivery. Current funding levels have not kept pace with the cost of delivery since the introduction of the current funding band methodology. This has led to a reduction in training providers; severely limiting capacity, potentially stifling quality improvement and creating bottlenecks in the skills pipeline. Immediate action is needed to ensure sufficient funding to support the development of a skilled, versatile and resilient workforce.

- Apprenticeship funding bands should be increased annually at least in line with the Consumer Price Index (CPI) to go some way to recognising fluctuating costs in delivering apprenticeships in safety-critical, highly regulated industries.

- Skills England should re-examine the funding model for apprenticeship funding. The current formula uses a 'one size fits all' approach across all c700 apprenticeship standards. The methodology does not recognise that many standards are genuinely more complex and costly to deliver.

- The purpose and impact of the 20% completion payment should be reviewed as it currently exists as a mechanism operating entirely separate to the funding band model and means that withdrawals are structurally underfunded, inhibiting quality improvement.

- To level the playing field for providers, consideration should be given to widening access to support measures that are available to Further Education Colleges, such as Employer National Insurance Contributions (NIC) increase exemptions.

- A number of Independent Training Providers hold charitable status but remain unable to access capital funding. ITPs train over two-thirds of apprentices in England and current funding levels do not cover increased costs which is leading to a reduction in training providers.

- In considering how to meet infrastructure demands as set out in the Industrial Strategy, the Government should enable more provider types – for example not-for-profit ITPs, to access capital funding structures for specific purposes. This would include establishing specialist training centres in partnership with employers in direct demand from industry. As part of this change, the government should ensure ITPs are able to access the £625 million recently announced for construction courses, Foundation Apprenticeships, and skills bootcamps.

4. Encourage businesses to further invest in electrical apprenticeships

The Government should work with leading construction and built environment stakeholders on an industry-led campaign targeting smaller electrical companies to raise awareness of the financial benefits of taking on an apprentice, i.e. their 'Return On Investment' for a business as well as positive outcomes in relation to corporate social responsibility.

Incentives for employers should recognise recent, substantial, increases in the costs and administrative demands of employing an apprentice. These increases have been especially strongly felt by small and micro-businesses, which account for over 99% of firms and 80% of electrical apprentices.

Substantially enhanced employer incentive payments and/or tax breaks are therefore needed to counterbalance actions by successive governments that have had the cumulative, unintended consequence of eroding the previously positive return on investment from employing an apprentice.

Clearer apprentice targets and stronger enforcement of those targets on construction and built environment projects will also help, as will outlawing of unreasonable practices by some built environment clients (in both the public and private sectors) – such as, blanket bans on anyone under 18 working on a site, or the disallowing of costs incurred in employing and/or supervising an apprentice. Investing in the next generation needs to become a precondition for winning work, rather than a competitive disadvantage.

Our insights

Developed by JTL in collaboration with our industry partners (Electrical Contractor's Association (ECA), The Electrotechnical Skills Partnership (TESP), Joint Industry Board (JIB), National Electrotechnical Training (NET)), a systems thinking approach has been taken to create a projection model for England's electrical workforce. The model unlocks visualisation of workforce trends over a fifteen-year span, showing outcomes and illuminating the dynamics between industry demand and the skills supply pipeline for new entrants into the industry workforce.

The electrical industry is highly regulated and safety critical. To recognise that reality, our research goes further than simply assessing workforce size and incorporates a competence element within the workforce. The combination of these two factors, in tandem with a focus on a specific occupation, makes this tool the first of its kind in this sector, to turn insight into foresight.

The 'Skilled person density' is the percentage of the workforce that is fully occupationally competent to practice i.e. in possession of an ECS Installation or Maintenance Electrician gold card (Electrotechnical Certification Scheme).

Data driven intelligence and forward planning is essential in this key occupation because of the duration of the electrical standard (four years). The skills and competence tap cannot be turned on and off with immediate results.

Despite a recent increase in the number of apprentices starting their training and joining the workforce in the last 3 years, the size of the electrical workforce in England is in decline; it has reduced by 26.2% since 2018 (214,200 in Dec 2018 to 158,000 Dec 2024, ONS). This indicates that workforce outflows are greater than inflows, regardless of whether new talent is entering the workforce via apprenticeships or other competence training routes.

The projection model demonstrates the workforce demand and supply side dynamics. Model users can vary the workforce size by, for example, increasing the number new entrants into the workforce and what proportion come via apprenticeships. Over time, depending on the assumptions applied, the workforce size, 'skilled person density', apprentices in learning and labourers are calculated, in order to model the supply side needs to meet increased demand.

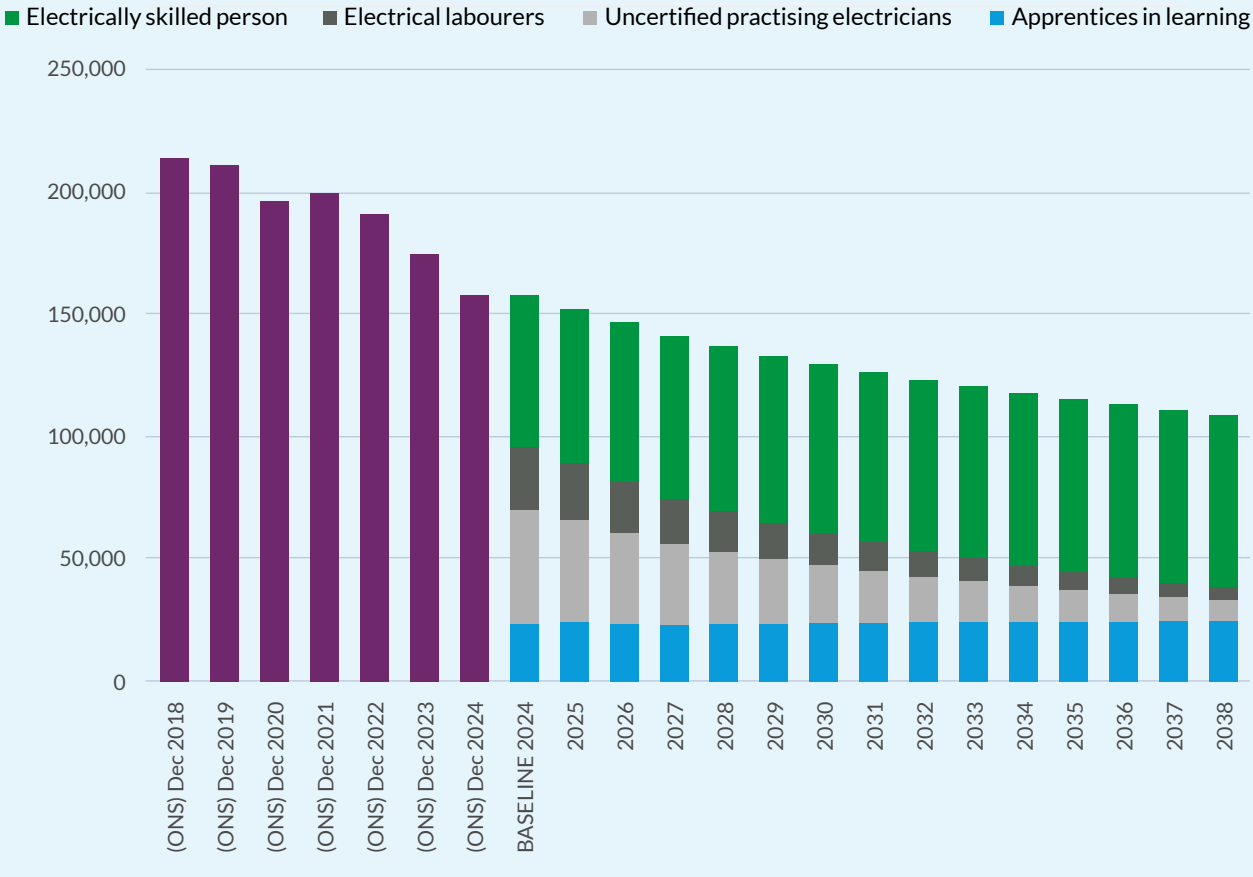
Scenario 1:
We do not currently have enough competent electricians – the workforce is declining.

Our projection model demonstrates that, based on the following assumptions, the workforce size would continue to decline:

- Baseline underlying attrition rate of 7.2% per year
- Continuation of the current 3-year average number of apprenticeship starts (7,540 annually), and assuming moderate achievement rate gains of 1.3% per year can be sustained, to a ceiling of 75%
- Current EWA / NVQ volumes

The workforce decline follows the recent trajectory, eventually reaching an equilibrium where new starters equal projected leavers. The 'skilled person density' increases from 39.2% to 64.7%, but largely as a result of the decline in workforce size.

Electrical workforce England: Projected workforce size and 'known skilled person' density



In order to maintain workforce size, employers will need to hire new talent. This will require increased apprenticeship starts and an upskilling of the existing part-qualified workforce via NVQ or EWR to maintain competency levels. This will also open opportunities for people with transferable skills from different sectors who are looking to change career.

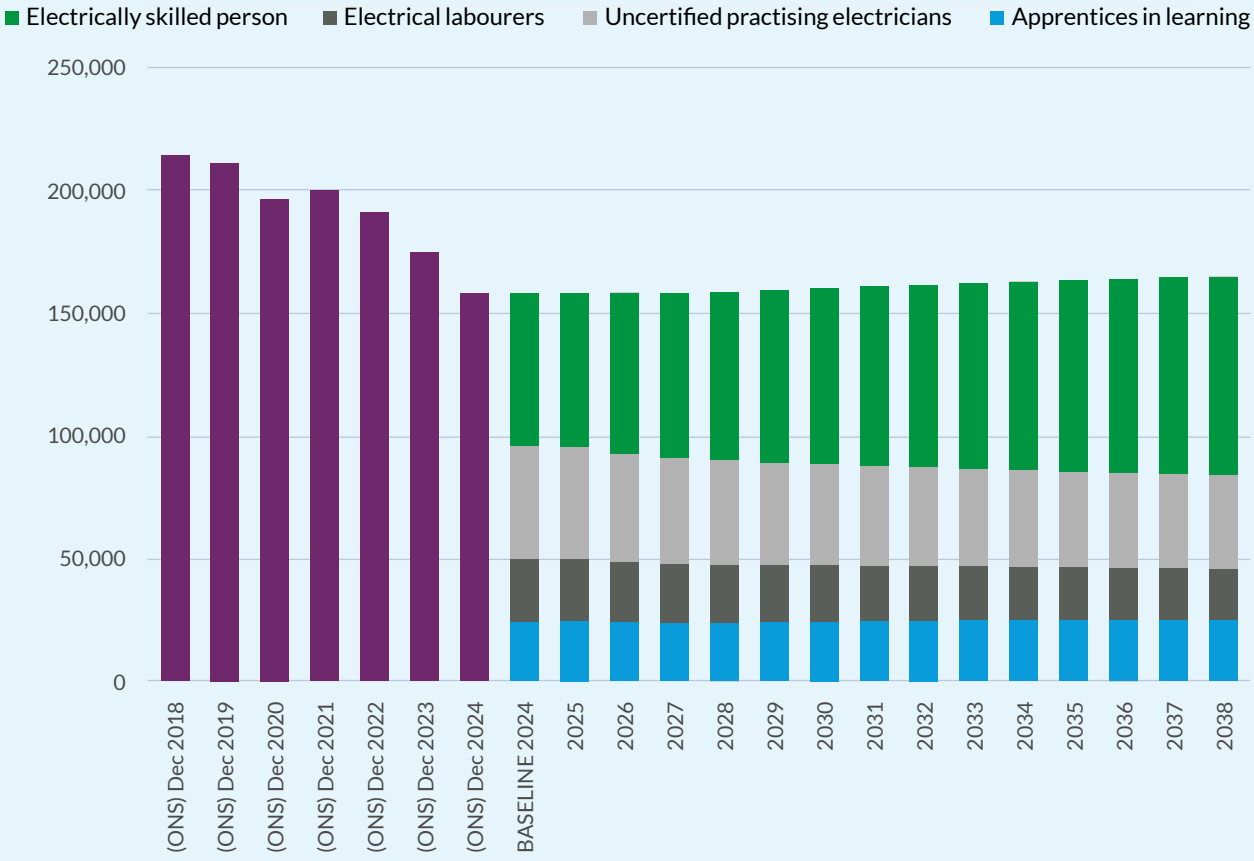
As businesses align with the updated Electrotechnical Assessment Specification (EAS) and with new duties for competence following implementation of the Building Safety Act 2022, expectations as to how enterprises assure workforce competence are being strengthened. It is reasonable to expect that employers will become less willing to hire unqualified workers to carry out work to certifiable standards and that proportions of certified skilled persons and labourers will need to increase.

On current volumes of apprenticeship starts and qualification via EWR & NVQ routes, the workforce size and skilled person density cannot both be sustained. A continued decline in workforce size must be expected, because new entrants into the workforce are lower than the rate of attrition.

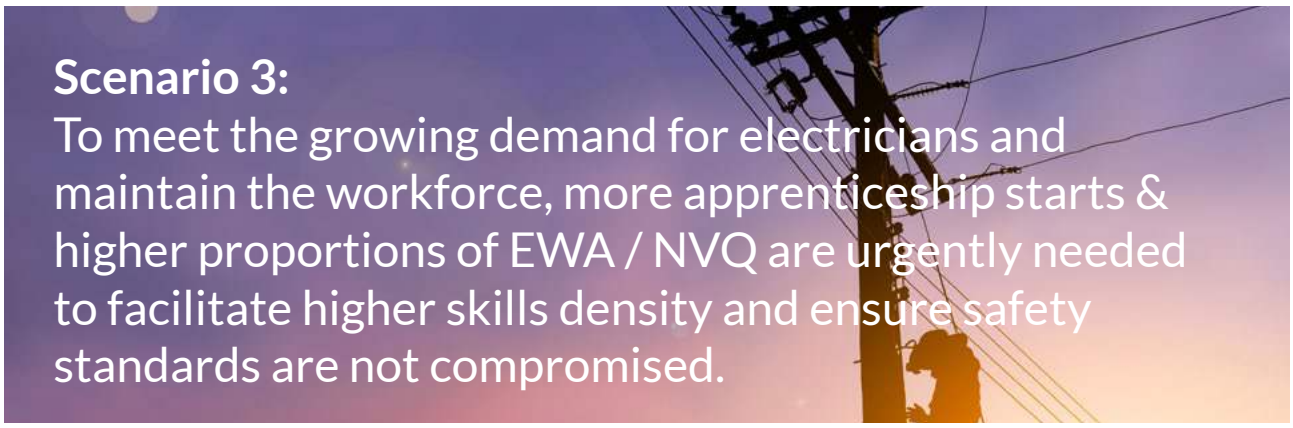
Scenario 2:
5,900 new entrants are needed each year to prevent the continued decrease in the size of the workforce

Using the same assumptions described in Scenario 1, based on 7,540 apprenticeship starts per year, the model shows that maintaining workforce size would require in the region of 5,900 further new entrants joining the electrical workforce each year. If all of these new entrants come from outside the apprenticeship route, based on current proportions of NVQ / EWR, the workforce size is maintained. However, this perpetuates a reliance on new entrants to the workforce from outside the apprenticeship route and the skilled person density takes longer to increase, which is incompatible with the direction of travel with more rigorous competence requirements such as EAS standards.

Electrical workforce England: Projected workforce size and 'known skilled person' density



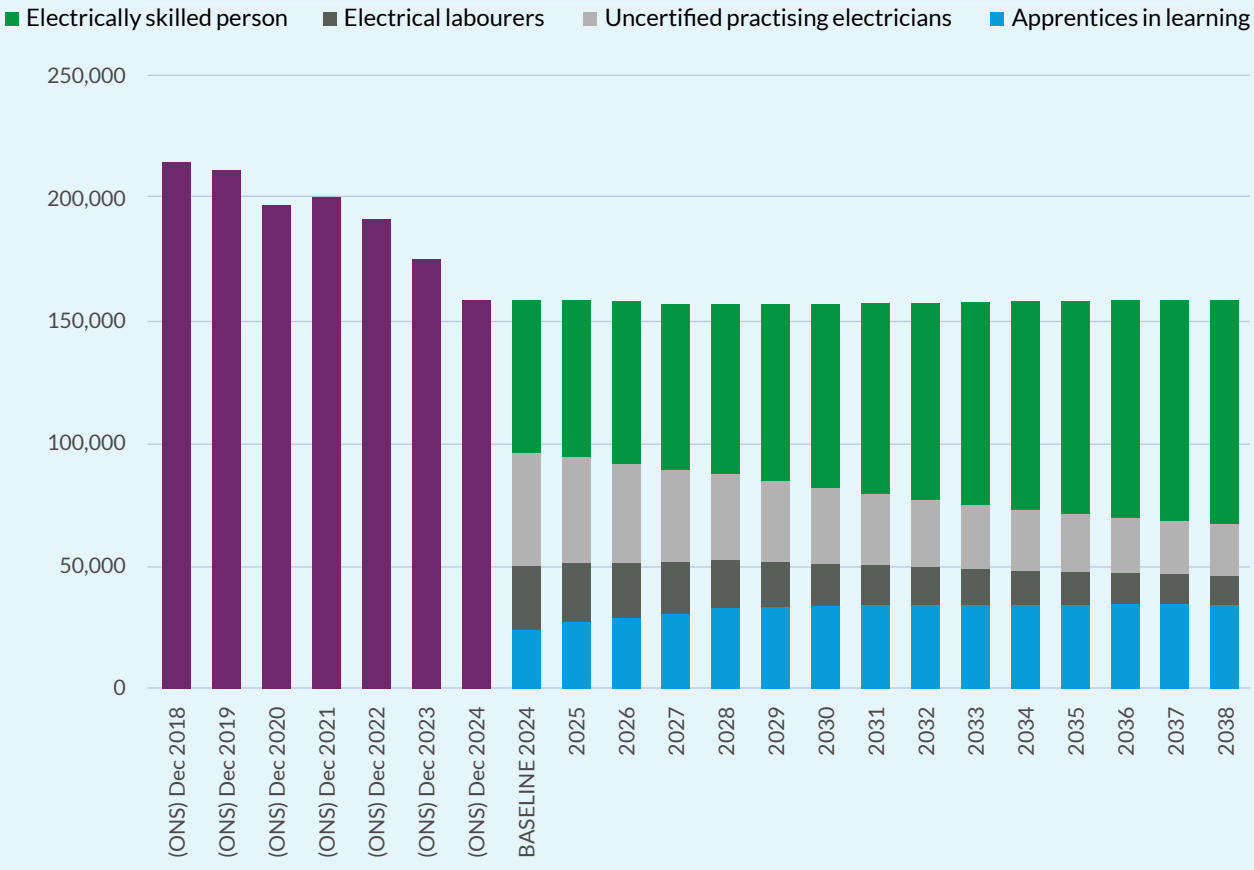
Note: Graphs 2 and 3 in the previous version of this report contained a design error, where the colours and values of two segments were incorrectly switched. The underlying data has always been correct. This updated version includes the corrected graphs.



Scenario 3:
To meet the growing demand for electricians and maintain the workforce, more apprenticeship starts & higher proportions of EWA / NVQ are urgently needed to facilitate higher skills density and ensure safety standards are not compromised.

Using the same assumptions again, with c5,900 new entrant a year to maintain the size, of which 50% follow the apprenticeship route (10,490 apprenticeship starts per year), along with a proportional increase in qualification via NVQ/ EWR (increasing from 2.5% of the unqualified workforce to 3.5% per year), the workforce skill level is compatible with the more rigorous EAS standards.

Electrical workforce England: Projected workforce size and 'known skilled person' density



Note: Graphs 2 and 3 in the previous version of this report contained a design error, where the colours and values of two segments were incorrectly switched. The underlying data has always been correct. This updated version includes the corrected graphs.

In all scenarios, quality improvement resulting in increased apprenticeship achievement rates leads to lower workforce attrition and improved 'skills density'. Higher volumes of qualification by existing unqualified electricians or labourers via EWR / NVQ routes increases skills density but does not directly influence workforce size.

While this report focuses on the size and composition of the electrical workforce, it recognises that wider systemic factors—such as technological advancements, changes in industry practices, and productivity gains—may also influence both the demand for skilled labour and how that demand is met. As such, we do not assert that the workforce must reach a specific size. However, given the safety-critical nature of electrical work, it is essential that the workforce, regardless of scale, maintains a consistently high level of competence to ensure public and workplace safety.

Scenario modelling

There are numerous scenarios that can and are being explored using the model, including maintaining a constant volume or ratio of certified labourers to support and assist fully qualified electricians. The common threads for consideration across all scenarios are:

- The impact on the size of the workforce
- Competence levels and how that relates to the range, versatility and productivity of the workforce
- Determining the optimal approach to the development of new entrants and existing members of the workforce, whilst ensuring the critical factor of safety is not compromised.

Methodology

The model uses ONS Annual Population Survey statistics[2], using tier 4 of the Standard Occupation Classification (SOC). Whilst there is ongoing investigation into the ONS, the statistics remain the official and nationally recognised data set and have therefore been used in this model. The model allows any data set to be inputted.

This model primarily focuses on occupation 5241 Electricians and Electrical fitters, along with a filter to also select the TESP wider definition of the electrical workforce.[3]

The forecasting model takes into account:

- The historic and baseline size of the electrical workforce (ONS).
- The underlying attrition rate
- The baseline volume of ECS Gold card holders (JIB, Electrotechnical Certification Scheme cardholder volumes).
- The baseline volume of ECS electrical labourer card holders (JIB)
- Apprenticeship withdrawal profile (JTL trend data).
- The volume of apprentices 'in learning' (DfE & JTL trend data).
- National achievement rates for electrical apprenticeships (DfE QAR).
- The volumes and proportions of individuals qualifying via the experienced worker assessment (EWA) and NVQ route (NET).

The baseline Certified 'Skilled Person Density' is calculated using the following formula:

ECS card holders: Electrical Installation or Maintenance / *5241 Electrical fitters / installers*	=	*Baseline 'Certified skilled person' density*
61,974 / 158,000	=	39.2%

Other known elements in the workforce include;

- ECS card holding labourers (25,706). A labourer has a specific job role within the JIB grading structure, with qualified electricians assessing and signing off completed work.
- Apprentices in learning.

The remaining 46,392 (of SOC 5241 Electrical fitters / installers) are collectively described as 'uncertified practising electricians'. Some of those may be qualified and we make no assumptions or judgement on individuals' competence. However, as we cannot measure the skill level within this group, it represents the unknown, which carries risk due to the safety critical nature of electrical work.

With thanks to the following organisations for data and insights:

Insights: The Electrotechnical Skills Partnership (TESP), The Electrical Contractors' Association (ECA), The Joint Industry Board (JIB), National Electrotechnical Training (NET), National Inspection Council for Electrical Installation Contracting (NICEIC) and Electrical Safety First (ESF).

Data sources: Office for National Statistics, Annual Population Surveys 2018–2024, via Nomis, dataset 210 and dataset 218. JIB (ECS card data), DfE (apprenticeship starts and official QAR national averages), NET (EWA & NVQ volumes), JTL (apprenticeship participation profiles).

[2]'Office for National Statistics, Annual Population Surveys 2018–2024, via Nomis, dataset 210 and dataset 218.'

[3]The Electrotechnical Skills Partnership (TESP) Labour Market Intelligence, Pye Tait: https://www.the-esp.org.uk/current-lmi-information/

About JTL

- Established over 30 years ago by the Electrical Contractors' Association (ECA) and Unite the Union, is one of the largest training providers in England and Wales, working with over 3,800 businesses and training more apprentices than anyone else in the building services engineering sector.

- JTL is a charity specialising in apprenticeships in the building and construction sectors, focusing on two key disciplines: electrical and plumbing. The Independent Training Provider (ITP) currently supports approximately 8,000 learners in their electrical and plumbing apprenticeships.

- Also part of the JTL Group is CompEx; the leading recognised competency standard for hazardous area safety, providing credible assurance for people working in explosive environments.

- JTL has 16 (soon to be 17) training centres across England and Wales and has plans to further expand this network and deliver the highest quality apprenticeships with state-of-the-art facilities; tailoring the learning experience to local, regional and national skills needs.

- The provider has a golden thread of quality and safety running throughout its apprenticeship standards, adapting to emerging technologies and cultivating a workforce that not only contributes to closing the skills gap, but also anticipates and fulfils the future demands of the dynamic wider industry.

Get in touch

Contact us or request a demonstration of the projection model:
Visit our website at jtltraining.com
Contact us at communications@jtl-training.com