

Blueprint for Electrification:

Delivering the UK's Transition to Clean Power

Foreword

The UK's journey to net zero will be defined by its ability to electrify. More than just a means of reducing emissions, electrification is the backbone of economic growth, energy security, and industrial renewal. It will reshape the way we power our homes, businesses, and infrastructure, unlocking new opportunities while protecting households and industries from the volatility of fossil fuel markets.

Yet despite clear ambition, delivery is falling behind. Policy conversations tend to focus on energy generation - on where power will come from - while paying too little attention to the systems and workforce needed to deploy and integrate that energy in homes, businesses, and public spaces.

The transition to electrification is complex, shaped by a mosaic of interconnected challenges – a shortage of competent, qualified electricians risks slowing deployment; an unstable business environment impacts supply chains; lack of consumer confidence and planning constraints hinder investment - each challenge reinforcing the next. While the immediate challenge is training and workforce capacity, without addressing other elements, even the most ambitious electrification plans will remain just that - plans. This Blueprint is about bringing everything into one place - a comprehensive, practical roadmap for electrification through the lens of those who will deliver much of it: electricians. It draws on wide ranging insights from across the sector – industry bodies, businesses, education providers and policy makers – to show the holistic picture of the steps needed to achieve electrification.

The Electrical Contractors' Association (ECA) represents the businesses and professionals who will make this happen. From upgrading the grid and expanding renewable generation to rolling out EV charge points and smart energy systems, electricians are at the heart of delivery. If we want electrification to succeed, we must involve the electrotechnical industry and confront the practical barriers slowing progress and take decisive action to remove them.

The Blueprint for Electrification is a call to action. The UK has a once-in-a-generation opportunity to be a global leader in electrification, creating a stronger, more resilient economy in the process. But this requires leadership, coordination, and a willingness to move beyond ambition to delivery. The time to act is now.



Steve Bratt Group Chief Executive Officer Electrical Contractors' Association



The value of electricians

Electricians are at the heart of the UK's transition to electrification.

As the professionals responsible for designing, installing, maintaining, and upgrading the electrical infrastructure that underpins modern energy systems, they are the driving force behind a successful shift to net zero.

However, despite their pivotal role, the contribution of electricians has often been overlooked in policy

discussions, which tend to focus on energy generation and infrastructure rather than the workforce required to deliver electrification in homes, businesses, and public spaces.

The demand for competent, qualified electricians is only set to grow as the country accelerates its adoption of lowcarbon technologies, such as solar PV, battery storage, electric vehicle charging infrastructure and heat pumps.

The electrical workforce at a glance



255,000

Total workforce in electrotechnical roles across industries





Average annual number of electrical apprenticeship starts across the UK since 2021/22

ECA has consistently championed the role of electricians through initiatives such as Electrifying Our Future, Electrical Skills Index, regional Electrotechnical Training and Careers Alliances (ETCAs), and the English and Welsh Charters for Recharging Electrical Skills, providing a data-drivenapproach to addressing workforce challenges.



221,000

Electrically skilled people working in the UK electrical contracting industry



1,000

Estimated annual number of additional electrical apprentice starts required to meet UK solar PV and EV charge-point roll-out targets

As we look ahead, ensuring a sufficient pipeline of skilled electricians will be essential not only for meeting net zero targets but also for sustaining economic growth and creating high-quality jobs across the UK.

The consumer perspective

Electrification isn't just an infrastructure challenge - it's a behavioural one. Households must be confident, informed, and supported to adopt new low-carbon technologies.

Electricians are the UK's most trusted advisers on electrification

When asked who they would most trust to advise them on installing clean home technologies such as heat pumps, solar panels, or EV chargers, UK adults chose **qualified electricians above all others.**

- Trusted advisers on electrification Almost a quarter (24%) of UK adults say they would trust a qualified electrician more than any other source including authorities to advise on which clean technologies to choose.
- Particularly high trust among the youngest respondents (18-24: 35%).
- Government agencies and regulators, such as Ofgem, are the second-most trusted at 18%, with the strongest trust among slightly older respondents (45-54: 21%) and social grade ABC1 (20%).

New national polling conducted by YouGov for this Blueprint shows a clear answer: the public trusts electricians to help them make the switch.





Understanding the barriers

The polling also asked the public what they see as the biggest barrier to switching to low-carbon technologies in their home. The responses paint a clear picture of the challenges policymakers must confront.

- **Cost is king** Upfront cost remains the biggest obstacle, cited by 40% of adults as their primary reason for not adopting clean technologies.
- Higher concern among older age groups (45-54: 48%, 55+: 40%) and those in lower social grades (ABC1: 42%).
- Renters are locked out Housing tenure presents a major barrier for renters, with 43% of private renters highlighting their rental status as preventing adoption.
- Advice gap remains Lack of trustworthy advice is an issue for 6% of the population, rising to 9% among younger adults (25–34).

All figures, unless otherwise stated, are from YouGov Plc. Total sample size was 2125 adults. Fieldwork was undertaken between 1st - 2nd April 2025. The survey was carried out online. The figures have been weighted and are representative of all UK adults (aged 18+).

Delivering the UK's Transition to Clean Power

Why do we need to accelerate electrification?

Accelerating electrification presents a unique economic and social opportunity for the UK economy. By electrifying the economy, the UK can capitalise on the opportunities presented by new technologies and become a world leading in net zero technology, infrastructure and jobs.



Economic growth

- The transition to an electrified economy presents one of the most significant economic opportunities of the century.
- In 2024, the Confederation of British Industry (CBI) reported that the UK's net zero economy grew by 10%, contributing £83.1 billion to the nation's Gross Value Added (GVA).
- Energy companies plan to invest up to £77 billion between 2026 and 2031 to upgrade and expand the UK's electricity infrastructure, creating approximately 100,000 jobs.

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Good career prospects

- A fully qualified electrician can expect an average starting salary in the region of £40K.
- An electrician is a career for the wider good of society and the environment.
- A competent, qualified electrician can choose to specialise in industries as diverse as construction, clean energy, transport, manufacturing or data infrastructure.



Consumer benefits

- Electric vehicles and electric heating systems have lower operational costs compared to their fossil fuel counterparts.
- The Climate Change Committee estimates that by 2050, household energy bills could be £700 cheaper annually due to electrification.

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Environmental impact

- Electrification is central to the UK's strategy for reducing greenhouse gas emissions.
- It is projected to account for 60% of the planned carbon emission reductions by 2040.
- Net zero carbon electricity will power the UK for short periods during 2025, supporting the Government's Clean Power 2030 ambitions.

Social and regional benefits

- A deliberate focus on electrification can drive inclusive growth by creating employment opportunities across various skill levels and regions.
- Investments in electrification projects can revitalise underserved communities, reduce energy poverty, and ensure that the benefits of the energy transition are equitably distributed.

Final Security

- Electrification reduces reliance on imported energy, making it vital to national energy security.
- By harnessing domestic renewable energy sources, the UK can mitigate geopolitical risks associated with energy imports and stabilise energy prices.

How do we get there?

The transition to an electrified economy offers substantial opportunities for economic growth, job creation, and environmental sustainability.

However, realising these benefits requires addressing a mosaic of interconnected challenges across policy, skills, infrastructure, supply chains, clients, and consumer engagement.

These challenges are interdependent; a shortage of skilled workers can delay infrastructure projects, while supply chain disruptions can escalate costs – all collectively hindering progress.

This Blueprint synthesises insights from various stakeholders - including businesses, industry bodies, policymakers, and supply chain participants to present a holistic view of the current landscape and actionable solutions. Ŷ

Consumer confidence and understanding

Business environment



Planning and grid connections



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Policy clarity and direction

Why do we need to act on this?

- Hindered investment Inconsistent and unpredictable energy policies have historically hindered investment and long-term planning in the UK's electrification efforts.
- Uncertain operating environment Fluctuating targets, delayed funding decisions, and regulatory inconsistencies have created an uncertain environment for businesses and investors.
- Efforts have faltered For example, EnergyUK have reported that efforts to decarbonise buildings have faltered due to inconsistent policymaking, resulting in significant policy gaps and a lack of investment urgency.

Recommendations:

1. Deliver long-term policy certainty

Ensure stability and predictability in net zero policies beyond electoral cycles to unlock investment and enable long-term industry planning.

2. Establish a cross-government electrification taskforce

Create a dedicated taskforce to coordinate electrification efforts across energy, transport, housing, and skills policy, ensuring a joined-up approach and regular industry engagement.

"The private sector is working in partnership with Government to push forward the transformation of our energy system. Investing in clean power and increasing electrification, alongside energy efficiency, is the only way to permanently deliver both energy security and stable, affordable bills in the long-term.

Most of the finance needed will come from the private sector, and policy certainty is needed to give businesses the confidence that the UK is the best place for them to invest."

Dhara Vyas, Chief Executive, EnergyUK



Workforce capacity and skills

Why do we need to act on this?

- Shrinking electrical workforce Office for National Statistics estimates are that the skilled electrical workforce has shrunk by around a quarter since 2018, with many regions - especially the North West, West Midlands, and London - facing severe skills gaps.
- Blocking learners' progression Fewer than 1 in 10 of learners who start a classroom-based electrical course in England subsequently secures an apprenticeship, blocking over 90% from progressing any further towards qualifying as electricians.
- Classroom-based training is failing to connect learners with employers – This leaves thousands of learners without the practical skills needed to enter the industry and fill jobs.
- The apprenticeship system is under strain Providers are struggling to recruit and retain capable tutors and assessors, whilst small electrical firms find the process of hiring and supporting an apprentice for four years increasingly bureaucratic and financially risky.
- Bootcamps are insufficient Bootcamps and other 'fast-track' routes, if adopted without full industry involvement and buy in, will prove to be a policy deadend, leading to an uncontrolled influx of workers without core electrical competencies, thereby undermining the safety and reliability of the net zero transition.

Recommendations:

3. Reform skills and apprenticeship pathways

Fix the electrical skills pipeline by transferring funding from classroom-based courses to apprenticeships and other industry recognised routes, reducing bureaucracy and boosting support for SMEs, and creating creating stronger progression between remaining classroombased courses and apprenticeships.

4. Tackle the electrical workforce shortage

Introduce targeted grants and incentives for growing the number of fully qualified electricians and upskilling already qualified electricians in new technologies. Involve and collaborate with electrical firms and industry bodies such as ECA from the outset in connection with these and any other proposals to tackle electrical workforce shortages. "Unite the Union is fully supportive of ECA's Blueprint for Electrification. The longstanding joint working relationship between the association and union encompasses our shared values and commitment to delivering skilled and competent electricians through quality apprenticeships and training to the highest industry standards.

Competent qualified electricians are key for the construction, retrofit, repair and maintenance of infrastructure, industry, commerce, housing, clean heat, and sustainable energy across the total construction and built environment process.

Developing a competent electrical engineering and contracting workforce in sufficient numbers is essential to meet the UK's requirements for economic growth, energy security, protection of the environment, and public safety.

Unite look forward to working further with ECA in securing the very best in electrical skills for society."

Jason Poulter, National Officer for Construction, Unite the Union



Full-time equivalent (FTE) electricians a year are needed to fulfil demand for solar by 2035. This represents an increase of 3.3% industry wide for solar alone and 1/8 apprenticeship completions a year for ten years. "Despite the urgent need for more apprentices, the current funding model fails to incentivise small businesses, who make up over 99% of the sector. While the Government in England covers 95% of training costs, it does not cover apprentice wages or compensate employers for the time and production invested whilst supporting apprentices, particularly in the earlier years. This acts as a major disincentive for small firms in particular. As a result, many experienced electricians who could train the next generation hesitate to take on apprentices, further restricting workforce growth. Recent increases in apprentice minimum wage rates (a 40% increase in two years) exacerbate the issue, meaning that previous welcome expansion in electrical apprentice starts might now grind to a halt or even go into reverse."

Andrew Eldred, Deputy CEO, Electrical Contractors' Association

Key to map

- High apprentice starts
- Low apprentice starts
- Very low apprentice starts

The data represents the number of electrical apprentices in 2022/2023.



Supply chain

Why do we need to act on this?

- Supply chain challenges are the most significant barrier to scaling up electrification – Material shortages and delays are slowing deployment, and the market is seeing an influx of low-quality and even fraudulent materials, undermining safety and reliability.
- Global supply chain dependencies create risks Many critical components are manufactured in a small number of global production hubs, leaving the UK exposed to disruptions. Solar panels, batteries, and EVs are particularly vulnerable to supply bottlenecks. Moreover, lead times for electrical components have lengthened, making it harder for industry to meet demand at pace.
- Without materials, the transition stalls -

Electrification cannot be delivered without access to high-quality, reliable products. Skilled tradespeople and strategies are not enough - if the right materials aren't available, installations cannot happen at scale. The UK must prioritise secure, resilient, and sustainable supply chains to keep pace with net zero targets.

Recommendation:

5. Secure critical supply chains

Support domestic manufacturing of key electrification components - such as solar panels, EV chargers, and batteries - to reduce reliance on volatile global supply chains. "We very much welcome ECA's Blueprint for electrification at a time when the odds are stacked against the energy transition without the proposed cross-Government **Electrification Taskforce. The Taskforce can** lay a platform for working through solutions to the critical investment barriers such as energy pricing; proactive electricity network capacity building; policy consistency for heat electrification and the electric vehicle rollout; and firm advice to back technology choices relative to customer needs. Most of all, we need a functioning pathway to apprenticeships for electrical contracting and electrical engineering or we can never meet the demand the transition requires."

Kelly Butler, Director of External Affairs, BEAMA



Supportive regulation

Why do we need to act on this?

- Fragmented regulation Responsibility for building and energy performance standards is spread across multiple departments, and the regulatory landscape for new builds and retrofits remains fragmented, inconsistent, and poorly enforced.
- Lack of progress There is growing frustration at the lack of progress on the Future Homes Standard. Without a clear and timely mandate, developers lack certainty, and consumers miss out on homes that are truly future-ready.
- Documents underpinning Building Regulations are misaligned – They also fail to focus on areas of greatest energy impact. This results in disproportionate compliance requirements and diverts focus away from more impactful interventions.

• The system is overly granular and inflexible –

Minor deviations from technical specifications can lead to significant project delays, tying up resources without delivering tangible benefits. Enforcement also varies significantly across local authorities, creating uncertainty for industry.

Recommendation:

6. Align and simplify regulations

Streamline building regulations, ensure consistent enforcement across local authorities, and mandate that all new homes are electric-ready (e.g., solar panels, heat pumps, and EV chargers).

(£) The price of electricity

Why do we need to act on this?

- The imbalance between levies on gas and electricity

 Levy imbalances are a barrier to electrification.
 Electricity bills are subject to a range of social and
 environmental levies which do not apply to gas bills.
- A key barrier to consumer adoption High electricity costs deter households from investing in less carbon intensive technologies. Despite long-term savings, upfront costs combined with expensive electricity make adoption less attractive.
- Making UK industry uncompetitive The UK has some of the highest industrial electricity prices in the world, making it more expensive for businesses to operate. Energy-intensive sectors face significantly higher costs compared to international competitors, affecting investment and growth.
- Lowering electricity prices is essential for electrification – Without action, the UK risks falling behind in net zero delivery, missing investment opportunities, and limiting economic growth.

Recommendation:

7. Reform electricity pricing

Address high electricity costs by ensuring parity of taxation between gas and electricity and incentivising off-peak energy use for consumers and businesses.

"We urgently need to accelerate heat pump installations, tackling the 13% of UK carbon emissions that comes from heating our homes. That needs effective, ambitious and clear Government regulation to set the direction for industry and consumers."

Dr Richard Hauxwell-Baldwin, Head of Research, Policy and Campaigns, The MCS Foundation



In their 7th Carbon Budget advice to Government, the Climate Change Committee (CCC) highlighted that while the shift to net zero should ultimately lead to lower energy bills, immediate action is necessary to overcome current barriers, particularly the upfront costs associated with lowcarbon technologies.

The CCC's number one recommendation is to make electricity cheaper as a way of better incentivising households and businesses to make the switch to low-carbon technologies – enabling them to see a positive impact on their energy bills.



Planning and grid connections

Why do we need to act on this?

- The UK's planning process is complicated and lengthy - Nationally significant infrastructure projects face multi-year approval timescales. This includes projects such as grid reinforcements, offshore wind connections, and battery storage capacity.
- Limited local authority capacity Local councillors have approval powers over projects in their areas under current legislation. However, they often lack access to data on local grid capacity or where demand is highest in their locality. Their capacity is limited, planning processes vary widely across geographies, and they are often bastions of NIMBYism – particularly in relation to solar farms, substations, pylons, and wind turbines, all of which are vital for electrification.
- Grid connection delays The grid wasn't designed to handle future demand and is in need of upgrading. Even once grid reinforcements are approved, they require grid connection offers before being built through Distribution Network Operators (DNOs) and the National Energy System Operator (NESO).
- **Projects are stuck in a first-come-first served basis** This leads to hold-ups for shovel-ready projects.

Recommendation:

8. Accelerate planning and grid connection reform

Introduce fast-track approvals for critical electrification infrastructure, set clear and enforceable service standards for grid connections, improve data access and transparency for local decision makers, as well as proactively expand network capacity in areas of current and future high-demand. "Energy Networks Association supports closer collaborative engagement between developers, contractors and network operators in order to deliver our key decarbonisation goals. We look forward to playing our part in the delivery of this Blueprint."

Mark Dunk, Head of Engineering, Energy Networks Association



Business environment

Why do we need to act on this?

- Late payments and onerous contract terms -Even with the Fair Payment Code, policy requirements, Procurement Act and late payment legislation, compliance is patchy. Public sector buyers often miss the 30-day payment target, while the private sector 'borrows' money from SMEs through delayed payment terms.
- Cashflow problems for contractors, caused by retentions – Despite consulting on this, Government blamed industry indecision for not intervening to resolve unfair practices like retentions. Yet over twothirds of industry wanted reform in an area widely acknowledged to be unfair. Businesses need stronger payment certainty to unlock growth.
- Procurement processes work against SMEs The processes favour larger firms, with complex application processes and bureaucratic hurdles all of which act as barriers for smaller businesses. Services such as 'Find a Tender' have attempted to increase access for SMEs in the public sector, but challenges remain.

Recommendation:

9. Strengthen the business environment for electrification

Improve procurement processes to better support SMEs and mandate fair payment terms. Ensure procurement processes are targeted to businesses who can demonstrate competence. "ECA works tirelessly for a fair payment landscape and to bring transparency to damaging practices. We were instrumental in designing the Payment Reporting Regulations and fixing the loopholes, as well as helping increase the resilience of payment in the Procurement Act and driving the Fair Payment Policy. But, until the abuse of retentions is resolved, and maximum payment terms are introduced in the UK, we leave the door open to unfair practices which inhibit growth by allowing big business to borrow cash from SMEs through delayed payment."

Rob Driscoll, Director of Legal and Business, Electrical Contractors' Association

i... 33%

According to our polling, 33% don't know where to turn to for advice on installing new technology, revealing a significant understanding gap to be bridged to build consumer confidence in this space.



Consumer confidence and understanding

Why do we need to act on this?

- Public trust in electrification is low With the possible exception of solar panels (PV), where consumers can see tangible results in the form of cheaper bills. The public see low-carbon solutions as complex, costly, or unreliable, slowing adoption of heat pumps, EVs, and other home energy solutions.
- Safety concerns remain a major barrier Research from Electrical Safety First highlights that misinformation and poor installation practices erode confidence in low-carbon technologies.
- **Competence is key** At the moment anyone can present themselves as an electrician, making consumers vulnerable to substandard installation.
- The purchasing journey is confusing From choosing the right product to finding a competent installer, the process is fragmented and overwhelming for consumers, leading to inaction.

Recommendation:

10. Improve consumer awareness and confidence

Launch a national information campaign on electrification benefits, tackling misinformation and simplifying the consumer journey for heat pumps, EVs, and home energy upgrades. Back this up with improvements to electrical training as outlined in Recommendation 3 and 4. Link Government funding and incentives to installation by competent qualified electricians.

"Unfortunately, people only remember 'bad stories' and are swayed by negative press. Bad actors risk not only the safety and lives of occupants, but also the reputation and growth of the industry. Ensuring public access to a sufficiently sized electrical installation workforce, skilled, trained and qualified to install these technologies is key to ensuring that we have a safe transition to net zero."

Luke Osborne, Technical Director, Electrical Safety First

Turning ambition into action

The future is electric, but ambition alone will not deliver the transition at the scale and pace required.

Real progress depends on addressing the structural barriers that are slowing deployment - from fragmented regulation and skills shortages to grid constraints and supply chain pressures.

A more coherent, coordinated approach is needed one that provides certainty for businesses, strengthens workforce capacity, secures supply chains, and ensures that planning and infrastructure systems support, rather than hinder, electrification.

By tackling these challenges together, the UK can accelerate progress, drive economic growth, and build a cleaner, more resilient energy future.

The following recommendations set out clear, practical steps to remove these barriers and unlock the full potential of electrification:

1 Deliver long-term policy certainty

Ensure stability and predictability in net zero policies beyond electoral cycles to unlock investment and enable long-term industry planning.

2. Establish a crossgovernment electrification taskforce

Create a dedicated taskforce to coordinate electrification efforts across energy, transport, housing, and skills policy, ensuring a joined-up approach and regular industry engagement.

3 Reform skills and apprenticeship pathways

Fix the electrical skills pipeline by transferring funding from classroom-based courses to apprenticeships and other industry recognised routes, reducing bureaucracy and boosting support for SMEs, and creating stronger progression between between remaining classroom-based courses and apprenticeships.

4 Tackle the electrical workforce shortage

Introduce targeted grants and incentives for growing the number of fully qualified electricians and upskilling already qualified electricians in new technologies. Involve and collaborate with electrical industry bodies such as ECA from the outset in connection with these and any other proposals to tackle electrical workforce shortages.

Secure critical • supply chains

Support domestic manufacturing of key electrification components - such as solar panels, EV chargers, and batteries - to reduce reliance on volatile global supply chains.

Align and simplifyregulations

Streamline building regulations, ensure consistent enforcement across local authorities, and mandate that all new homes are electric-ready (e.g., solar panels, heat pumps, and EV chargers).

Reform electricity pricing

Address high electricity costs by ensuring parity of taxation between gas and electricity, and incentivising off-peak energy use for consumers and businesses.

Accelerate planning and grid connection reform

Introduce fast-track approvals for critical electrification infrastructure. set clear and enforceable service standards for grid connections, improve data access and transparency for local decision makers, as well as proactively expand network capacity in areas of current and future high-demand.

9 Strengthen the business environment for electrification

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10. Improve consumers and Improve consumer confidence

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Contributors

The development of this Blueprint has been a collaborative effort, enriched by the insights and expertise of numerous individuals and organisations.

We extend our thanks to:

- YouGov
- Certsure
- National Inspection Council for Electrical Installation Contracting (NICEIC)
- Unite the Union
- EnergyUK
- BEAMA
- Energy Networks Association
- The MCS Foundation
- Electrical Safety First

Electrifying Our Future

In collaboration with Content With Purpose (CWP), ECA launched the Electrifying Our Future digital series to explore the critical role of the electrical industry in delivering the UK's net zero ambitions.

This initiative delves into the challenges and opportunities associated with the transition to a lowcarbon world, highlighting topics such as renewable energy integration, smart infrastructure, and advanced electrification technologies.

By showcasing the people, innovations, and strategies driving this transformation, the series aims to inspire and engage audiences, catalysing collective progress toward a sustainable future.



Electrical Contractors' Association (ECA) is the UK's largest trade association representing electrical, electrotechnical and other engineering contractors in England, Wales and Northern Ireland at regional, national and European level. ECA member-companies are rigorously assessed before membership is approved.

Member firms have a combined turnover in excess of £6 billion annually. Member firms carry out design, installation, inspection, testing, maintenance and monitoring activity across the domestic and commercial sectors. This ranges from power and lighting to data communications, to energy efficiency and renewables, as well as the design and installation of cutting-edge building control technologies.

ECA's near 2,700 members range from SME electrical firms to nationwide engineering contractors and building services firms that employ thousands of professionals on major UK projects. ECA members also support over 5,000 apprentices annually.

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