

Putting 'the Customer' at the heart of a future smart and secure electricity system

Why the UK urgently needs to address critical customer proposition signals to support the promotion of electrification - including heat, transport and smart appliances - at scale, and deliver on its Net Zero commitment. The customer is at the heart of success, and we need to act now to ensure market readiness ahead of 2025.

Summary

- The UK has the ambition of being a global leader in the race to Net Zero, however, in many sectors actual delivery to date has been poor.
- Electrification based on increasingly green generation has huge potential, but the current policy framework and market conditions are not promoting mass deployment of low carbon technologies.
- A 'reshaping' of electricity costs urgently needs to happen to ensure that electric solutions are more economical to run than fossil fuel alternatives.
- Multi-rate tariffs represent an 'available now' market signal for electrification but need urgent reform by Ofgem within its new Net Zero remit.
- Dynamic tariffs need to be developed to build on the multi-rate story and encourage deployment of the smart electric technologies which are the foundation of the flexible, smart and secure energy system of the future.
- The Government Public Attitude Trackers demonstrates that there is a lot to do to convince the customer of the value of electrification. Awareness of the need to change home heating for net zero is held by a minority, and less than a fifth say they would consider a low carbon electric heating system next time they need to change.
- Unless customers can trust and understand the value of Customer Energy Resources (CER) – ie products that can generate, store and consumer electricity - at the centre of electrification, there will be no investment.
- There are 5 key strands to ensure customer readiness:
 1. Can I find and trust advice to do the right thing?
 2. Will electrification save me money?
 3. Will it improve my lifestyle and comfort?
 4. Will electrification add value to my home?
 5. Can I access a clear financial support package?

The role of electrification in delivering Net Zero

The importance of electrification in decarbonising heat and transport has been recognised in various high- level policy documents including [The Ten Point Plan for a Green Industrial Revolution](#), the [Heat and Buildings Strategy](#), [British Energy Security Strategy](#) and the [Net Zero Review](#). The UK Government has laid out a vision for the future through its 'Powering Up Britain' framework in Spring 2023, setting an ambition for 'British Energy for British Homes' at the cheapest price point in Europe by 2035. However, unless we start to talk about the customer now and invest time and policy intervention in the direction of the customer, there is no guarantee of a successful market outcome.

Rapidly decarbonising grid but low uptake of low carbon technologies

Last Summer, the Climate Change Committee delivered its annual report to Parliament, outlining that while the UK is a leader in terms of ambition, it is under-delivering on implementation and is at real risk of missing the targets set under the Sixth Carbon Budget. Addressing energy efficiency and decarbonising buildings is a key area where progress has been unsatisfactory, despite ascertaining how this could be approached in reports such as the [Cost Optimal Domestic Electrification Report](#) published by the Department for Business, Energy & Industrial Strategy in 2021.

Government has committed to fully decarbonising electricity generation by 2035, and over the past decade emissions from electricity have reduced by nearly 70%¹ ahead of most major economies.²

However, the UK has also been one of the slowest countries in Europe to adopt low carbon heating systems, specifically electric heating as a mass-market solution to the decarbonisation of heat. Statistics from the European Heat Pump Association 2022 data indicate that the UK performed the worst in Europe for deployment of heat pumps³, now widely acknowledged globally as a key technology for decarbonising buildings.

¹ [Current programmes will not deliver](#) by CCC

² [No One Will Be Left Behind On The Road To Net Zero: Low Carbon Heat By Design](#) report by BEAMA

³ EHPA stats, 2022

Some Simple Triggers To Act On Now

- Re-balance energy costs as a matter of urgency, ensuring electricity is the most cost-effective fuel of choice for the customer
- Ensure that there are transparent and easy to understand price signals available through the current tariff structure
- Provide the information and well targeted advice NOW to bring the customer on the journey
- Focus urgent attention on Green Finance options to stimulate investment in the home, coupled with accredited and trusted advice
- Ensure there are no hidden costs to participation through a trusted and transparent network connection process

Urgent need to rebalance electricity costs

Currently, the price of electricity in the UK presents a major barrier to the deployment of electric solutions. It is barely possible for a heat pump to compete with a gas boiler on running costs. Furthermore, opting for a 100% green tariff is typically even more expensive, which intuitively is not correct. Without positive price signals, most consumers will not invest in new technologies purely to reduce their carbon footprint.

Eliminating green energy surcharges and reforming electricity prices to reflect the lower cost of renewable and nuclear generation which now dominates the generation mix (and to eliminate distortions caused by high gas prices) would significantly change the incentives to consumers and renewable generation investors. The need for 'rebalancing' of costs placed on energy bills to incentivise electrification was acknowledged in the [British Energy Security Strategy](#); urgent action is now needed in this regard.

The impact on electrification of transport

The lack availability of tariffs for electric vehicles is also causing some drivers to reconsider their decisions to go electric. The charging costs for EVs are affected by the same market distortions as for electric heating, but rather more complicated as these include on street and service station situations. The main impacts of this paper focusses on heating, but they have a similar affect for electrification of transport and other smart electric technologies. BEAMA is considering a parallel paper highlight potential solutions for this market.

Tariffs – unlocking behavioural change

In addition to rebalancing electricity costs, ensuring the availability of appropriate tariffs is key to incentivising deployment of electric technologies and rewarding consumers for flexible or off-peak electricity use, which will be increasingly important into the future. As generation becomes more variable and more electric load comes online, flexibility and storage will be required to facilitate the transition from a supply-side to a demand-side managed system. Due to the current energy crisis, we are already seeing this need for

flexibility, demonstrated by the fact that National Grid's Demand Flexibility Service has been activated on multiple occasions this recent Winter to avoid peak demand outstripping supply.

However, currently, standard tariffs available in the UK do not incentivise use of electricity versus fossil fuels, nor flexibility, and are in fact a major barrier to electrification. There are barely any flexible or dynamic tariffs available today (Octopus Agile being a notable exception). Even for the off-peak and multi-rate tariffs which exist (Economy 7 and others), which are a stepping-stone to future flexible and dynamic offerings, there are several challenges: Off-peak rates do not suitably reflect the lower costs of wholesale electricity at night.

- Suppliers have flexibility to set relative day and night rates is creating a lottery across suppliers and more widely (with inadequate advice to customers on ensuring that Economy 7 or other multi-rate tariffs are suitable for their needs).
- Multi-rate tariffs (primarily Economy 7) are not adequately considered in the wider policy decisions around the price cap and are therefore not fairly protected.
- Information on availability (and rates) of multi-rate tariffs is not easily available as many suppliers do not publish prices and price comparison tools do not provide adequate information for consumers in this part of the market.
- Further, more detailed information is available in the report entitled ['It's a Lottery: how Ofgem's price cap fails Economy 7 customers'](#)

Ofgem's extended remit to incorporate Net Zero powers should be asserted as early as possible to address re-balancing and tariff structures in support of electrification.

Information & Advice to Position Electrification Technologies as Best In Class

The simplest and most widely used signal for energy efficiency assessment in the UK is the Energy Performance Certificate (EPC). However, the EPC framework is currently producing perverse outcomes due to its inability to accurately assess technologies, either through gas vs electricity cost and carbon assessment discrepancy, or simply the lack of inclusion of products such as phase change energy stores or dynamic smart storage heating. Taken together, electric space and hot water heating products are not favoured within the EPC model.

With the desired shift towards minimum Band C EPC ratings in the next few years this is an urgent issue to resolve on the pathway to electrification. Rebalancing energy prices must be quickly linked to the EPC rating model. In addition, the model itself will need to expand its technology coverage. Finally, it is imperative that the model outputs are reviewed urgently as EPCs currently do NOT recommend heat pumps. This is a direct contradiction to Government policy and grant funding focus through the Clean Heat Grant.

Unless the model is addressed, once EPC band C is introduced, smart and efficient forms of storage heating (heat and hot water electrification) will be unable to meet the minimum criteria. The result will be customers choosing

fossil fuel systems that will not be changes again for 10-15 years.

Beyond the relatively simple task of reforming the EPC model, the overall area of independent advice for Net Zero and flexible energy systems needs to be urgently addressed. There is no single trusted source of impartial advice which operates at the local level and gives confidence to customers.

Green Finance to Unlock Customer Retrofit Investment

Electrification does not have to involve a cost barrier to entry, although in the case of heating, it is likely that smart and flexibility enabled appliances will attract a premium price over traditional heat technologies.

In the current policy driven financial stimulus package, there are some inherent barriers to take up. For example, the technology suite promoted is far too narrow to give customers an equitable and achievable target for investment. BEAMA has previously made the case to re-define the supported methods of heating. Only 7m homes have a hot water store (23% of homes) with no clear plan to rectify this anomaly; no provision is made for modern smart electric storage heating or phase change energy stores; and there is a general lack of financial commitment to promote electrification through its value to the home.

This touches on the finance and value strands of customer readiness. In terms of technology and building investment support, there are simple customer facing options beyond just Green Finance instruments:

- Stamp Duty relief for homes rated at a performance point above an EPC C
- VAT relief on all recognised electrification technologies as they become seen as Energy Saving Appliances (ESAs) in line with the recent VAT review
- Extension of scope for the Boiler Upgrade Scheme to other recognised ESA measures as they come on stream
- Begin the process of integrating smart electric heating appliances into the Energy Company Obligation which will ensure credibility for the technologies required

By addressing the issues highlighted in this report related to tariffs and general financial stimuli, grant funding will be less important over time as there will be real financial benefits to adopting smart, low carbon technologies. For accelerated delivery of this transition however, it is critical that funding for electrification of key sectors such as heat in buildings and transport be considered in a manner which protects and grows consumer-owned assets. These assets will be required to effectively demand-side-manage our future energy system, storing, generating and offering flexibility at a local level for the maximisation of benefit which our soon-to-be decarbonised electricity grid can offer.

Ready to Connect Quickly and Without Hidden Costs

Customers need to be convinced that there are no hidden cost barriers to entry. If there are to be additional cost barriers, these must be transparent in nature and value from the outset of investment.

A good example of such a barrier is the connection of a heat pump which may trigger a level of necessary network investment at the local sub-station level. Much progress has been made in this area. For example, BEAMA is working with the Energy Networks Association on a simplified digital asset registration process; additionally, the network operators are socialising the costs of connections within their business models.

A particular gap in customer confidence comes in the shape of house linked network upgrade costs – the final few metres to the home. Whilst we do not dispute that this cost should be with the customer, they must always have very clear, transparent and accessible information regarding costs and timescales for connections. There are currently no published costs for customers from the Distribution Network Operators (DNOs) and this is another easily rectified barrier which can be enforced by Ofgem with its expanded Net Zero remit. The action is simple: regulate a standard 'metre by metre' cost of last line upgrades and ensure these are published by the DNOs on their websites.

Key Asks

- UK Government should urgently review [electricity price structures](#) to re-balance and incentivise use of electricity versus fossil fuels.
- UK Government should task Ofgem to fulfil its Net Zero remit in reviewing current multi-rate tariff structures to ensure consistency and fairness, whilst [accelerating dynamic tariff offerings](#).
- UK Government should undertake a [review and reform of the EPC framework](#) to ensure a broad range of electrification technologies are recognised and rated appropriately against new energy cost and carbon data.
- UK Government should re-assess the technology support under the Boiler Upgrade Scheme and [develop proposals for financial relief beyond a simple grant scheme](#).
- UK Government should task Ofgem to review and [reform the transparency and consistency of network connection charges](#) which may affect the customer and influence purchase behaviour.
- UK Government to develop firm proposals to [address the provision of impartial customer advice for electrification](#). As market development will run at different speeds regionally, depending on demographics and the energy network capacity, this should be a potential return to the previous tried and trusted Sustainable Energy Centre model managed by the Energy Saving Trust (previously Energy Efficiency Advice Centres).

Our Industry Commitment

BEAMA fully supports the Government's commitment towards electrification. Through our membership, representing manufacturing with revenues of £13bn, a workforce of over 90,000 and exports valued at £5bn, we will continue to inform and support Government in the development of the policy requirements within this report.

This work is already underway through our proactive and expertise driven involvement in the Smart and Secure Electricity System framework. In the coming months we will be working more closely on developing the Customer Journey towards electrification in order to ensure that the right level of demand is available for a flexible energy future.