# Tackling the energy trilemma – decarbonisation, energy security, affordability

## Why the UK urgently needs correct price signals and tariffs supported by clear long-term strategy to promote electrification at scale, deliver on its Net Zero commitment, make consumer bills more affordable, and remain globally competitive.

## 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 which exist today need to be reviewed so that vulnerable consumers are fairly protected under the price cap and rewarded for off-peak use today.
- Dynamic tariffs need to be developed to encourage deployment of smart electric technologies which are the foundations of the flexible and secure energy system of the future.


## 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 most recently as part of Chris Skidmore's Net Zero Review. However, without a long-term strategy and clear policy framework supported by appropriate market mechanisms, electrification will not materialise at scale.

## Rapidly decarbonising grid but low uptake of low carbon technologies

Last Summer, the Committee on Climate Change delivered its annual report to Parliament, outlining that whilst 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 CODE 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 pumps, 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

## 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. BEAMA is considering a parallel paper highlight potential solutions for this market.

## Tariffs – the key to unlocking electrification

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'.[3]

[3] 'It's a Lottery: how Ofgem's price cap fails Economy 7 customers' report commissioned by Glen Dimplex Heating & Ventilation and written by independent consultant and energy thought leader Maxine Frerk

## Why is this so important?

Today approximately 10% (3 million) of households use Economy 7 or similar multi-rate tariffs. A disproportionate number of these customers are on low or very low incomes and are suffering from fuel poverty and / or typically may be more vulnerable due to their age, heath or personal circumstances.

Therefore, it is critical that this group of customers is given the attention it deserves to ensure that it is protected from the crippling impact of the energy crisis.

Furthermore, multi-rate tariffs today, predominantly in the form of Economy 7, are suitable (and likely to be preferable to single rate tariffs) for consumers with electric technologies with in-built storage which can provide flexibility such as electric vehicles, heat pumps, storage heaters etc. Additionally, incentivisation of regular use of off-peak electricity has much more potential to deliver benefits to the grid and to consumers that one off Demand Flexibility events (which are indeed also needed for effective management of the electricity system). Therefore, proper regulation and transparency around Economy 7 and other multi-rate tariffs is critical to preserve, and grow, the base of installed assets which can provide flexibility. The Net Zero Review report mentions the role of 'overnight' tariffs in reducing running costs for consumers and delivering Net Zero; such tariffs are an enabler for the energy transition and if protected, will pave the way for the development of new, dynamic tariffs which will be central to a secure, flexible and decarbonised electricity grid.

## Electricity market design fit for the future

Recognising the importance of electrification in Net Zero, Government is currently reviewing the electricity market (REMA). It is vital that this results in the creation of an electricity market that provides long term support to the necessary investment in renewables whilst also establishing a parallel market for system balancing that will similarly provide the correct incentives for investing in hydrogen storage and demand flexibility. These markets must be tested to ensure that they survive the next twenty years and enable the transition to a net zero electricity system. Market design is important, but crucially, adequate financial incentives need to be available for customers to maximise the use of low carbon generation and respond to demand flexibility signals; tariffs are a key element of this.

## Supporting policy framework and funding to promote uptake of low-carbon technologies

In addition to rebalancing energy costs and ensuring suitable tariffs, relevant legislation such as the upcoming building regulations (Future Homes Standard) and supporting SAP software updates need to encourage electrification through the deployment of low-carbon and energy efficient solutions. It is important that this, in tandem with the Smart and Secure Energy Systems legislation, also promotes the deployment of flexible assets which are smart-enabled and capable of responding to grid requirements to use energy at times that are lower carbon and / or cheaper.

Funding in support of electrification has so far been largely ineffective. By addressing the issues highlighted in this report, funding will be less important 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.

## Key asks

- UK Government should review electricity price structures including removing green levies from electricity bills and reshaping how costs are recovered to incentivise use of electricity versus fossil fuels.
- UK Government should provide clear long-term policy and supporting legislation to promote electrification and uptake of smart, low-carbon technologies for heat in buildings and transport.
- UK Government should accelerate smart meter rollout and mandate suppliers to offer dynamic tariffs or services which facilitate deployment of smart electric solutions and reward customers for providing flexibility.
- Ofgem should prioritise a full review of Economy 7 (including calculation of wholesale costs and flexibility for suppliers to set day-night rates) its Programme for Work on the Price Cap (and work with the Department of Energy Security and Net Zero on the interactions with the Energy Price Guarantee).
- Ofgem should take measures to improve transparency in relation to Economy 7 tariffs under the Price Cap both on its own website and by requiring suppliers to publish Economy 7 tariff price schedules (and to proactively advise customers who are clearly not on suitable tariffs for their usage patterns).