Consumer Scotland
Luchd-Cleachdaidh Alba

Supporting consumer-led energy demand flexibility in Scotland

November 2026

Executive summary

Enabling consumers to use electricity more flexibly is key to meeting the UK's clean power and net zero goals. [1,2] By moving their use of electricity away from peak times of day (early morning and evening) when there is more demand, or increasing it when there is more supply, consumers can potentially reduce their own bills and the bills of all consumers. This is important, not least at a time when over a third of households in Scotland report not being able to afford to heat their homes to a comfortable level and household energy indebtedness has risen to record levels.[3]

New research has explored the ability and willingness of consumers in Scotland to shift their electricity use and the potential benefits to different groups of doing so.[4] This briefing summarises the key findings. In particular, around how access to low carbon technologies (LCTs) enables or limits consumers potential to participate in, and benefit from energy demand flexibility, the opportunities and barriers to consumer behaviour change, and the distributional impacts of Time Of Use (ToU) tariffs. It also sets out a number of high-level policy recommendations, including for the delivery of new fuel poverty and heat in buildings strategies in Scotland and in relation to policy and regulatory frameworks at UK-level.

Summary of findings and recommendations



Access to technologies

Key Finding 1: Access to low carbon technologies (LCTs) that can enable the greatest shifts in, and benefits from, energy demand flexibility is limited, with the upfront cost of these technologies a significant barrier.

Recommendation 1: Unlock the benefits of energy demand flexibility to a wider range of consumers in Scotland by improving access to, and confidence in using, LCTs.

Key Finding 2: Smart meter coverage in rural areas in Scotland is still falling behind the rest of the UK, potentially limiting the abilities of those living there to benefit from flexible energy use.

Recommendation 2: Enable all households to realise the benefits of flexibility by sustaining momentum around the smart meter roll out in remote and rural locations in Scotland.



Behaviour change

Key Finding 3: Financial incentives are key to changing energy use behaviours, but the levels of gain are limited by access to LCTs.

Recommendation 3: Be clear with consumers about the benefits from various forms of energy demand flexibility, as well as the wider purpose and benefits.

Key Finding 4: Consumers have concerns around automation, which is viewed by many in the sector as essential to scaling up consumer-led flexibility.

Recommendation 4: Ensure robust, enforceable regulation that protects consumers but also enables them to retain agency and control.



Time of Use (ToU) tariffs

Key Finding 5: ToU tariffs are not well understood, and consumers are unclear about if and what type of tariff they are on, and whether a ToU tariff would work for them.

Recommendation 5: Support consumers to make informed choices about ToU tariffs.

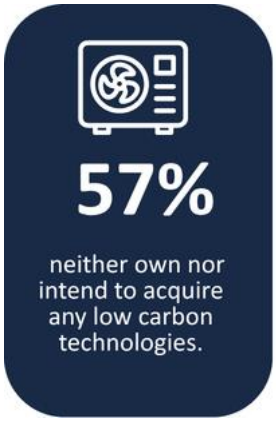
Key Finding 6: Switching to a ToU tariff combined with shifting electricity use to off peak times can save money on energy bills, but levels of savings are dependent on access to technologies.

Recommendation 6: Understand and shape the distributional impacts of ToU tariffs and wider energy demand flexibility products and services.

Key findings and recommendations

Access to technologies

Key Finding 1: Access to low carbon technologies (LCTs) that can enable the greatest shifts in, and benefits from, energy demand flexibility is limited, with the upfront cost of these technologies a significant barrier.



Those with greater access to LCTs such as heat pumps and electric vehicles are more capable of shifting their electricity use and benefitting from ToU tariffs.[5, 6] The research categorised respondents as 'High Capability', 'Emerging Capability' or 'Low Capability' dependent on their access to technologies including smart home heating controls, solar panels, EVs, storage heaters, home battery storage for electricity and heat pumps. As highlighted in Table 1, most participants (57%) were in the 'Low Capability' group, and neither own nor intend to acquire any LCTs. Just over a quarter (27%) were in the 'Emerging Capability' group and own at most one LCT or are in the process of acquiring / intend to acquire at least one more. 16% were in the 'High Capability' group and own at least one LCT and are in the process of acquiring two more / intend to acquire at least four more or own two or more technologies.

Table 1: Energy demand flexibility consumer typology groups

Low capability	Neither own nor intend to acquire any LCTs	57%
Emerging capability	Own at most one LCT or are in the process of acquiring / intend to acquire at least one more	27%
High capability	Own at least one LCT and are in the process of acquiring two more / intend to acquire at least four more or own two or more technologies	16%

Capability to engage with flexible energy use varies across different demographic and socioeconomic groups. 'High Capability' consumers were commonly younger and living in households with children. 'Emerging Capability' consumers were more likely to have higher incomes and be owner-occupiers. Renters were more likely to be in the 'Low Capability' group as compared to owner occupiers (54%). Social renters (24%) were more likely to be in the 'High Capability' group compared to owner occupiers (16%) and private renters (8%). The prevalence of social renters in the 'High Capability' group is potentially as a result of publicly funded schemes to improve the energy efficiency and install clean heating in these types of households.

Cost was cited as the primary barrier to owning heat pumps, electric vehicles or solar panels. 46% of those without an EV cited purchase price as the main barrier. Among the vast majority (95%) of those who did not have a heat pump, 37% thought that the purchase price or running costs were prohibitively expensive. Just over a third (34%) indicated that the cost of purchase and installation was a barrier to solar panel adoption and use.

Recommendation 1: Unlock the benefits of energy demand flexibility to a wider range of consumers in Scotland by improving access to, and confidence in using, LCTs.

Scottish Government can play a pivotal role in increasing uptake and effective use of LCTs, which are integral to meeting fuel poverty, heat decarbonisation and climate ambitions in Scotland, as well as enabling more flexible energy use. They are due to set out their plans in forthcoming heat decarbonisation and fuel poverty strategies. Within these the Government should outline not just how cost barriers will be overcome, but how advice services will evolve to support consumers around the installation, effective use and maintenance of LCTs.

It will also be important for Scottish Government and local authorities to work with the National Energy System Operator (NESO) when designing local energy efficiency and fuel poverty interventions such as area-based schemes to consider how resources for LCT deployment at a local level can be targeted most effectively to meet both household and overall energy system needs.

In terms of improving consumer confidence, the UK Government is planning to establish the Warm Homes Agency which will deliver an integrated service covering consumer advice, quality assurance, remediation and redress. In doing so, it should coordinate closely with the Scottish Government to ensure the service works effectively across GB where appropriate and complements schemes in the devolved nations.[7, 8]

Key Finding 2: Smart meter coverage in rural areas in Scotland is still falling behind the rest of the UK, potentially limiting the abilities of those living there to benefit from flexible energy use.

Smart meters are essential to consumers accessing and making the most of flexibility products and services, including LCTs and ToU tariffs. Positively, the overwhelming majority of respondents (85%) report having or being willing to get a smart meter.



However, those living in island areas in Scotland were less likely to report having a smart meter, which aligns with other analysis undertaken by Consumer Scotland, highlighting how there is lower smart meter coverage in rural and island areas.[9] For the 15% of respondents who said they did not have and would not consider getting a smart meter, the main reasons cited were that they did not need or want one, there was no guarantee that a meter would save them money and they had heard negative things about them from family and friends.

Key Recommendation 2: Enable all households to realise the benefits of flexibility by sustaining momentum around the smart meter roll out in remote and rural locations in Scotland.

With the ongoing rollout of smart meters to households, Ofgem should drive a focus on underserved areas that includes remote and rural locations in Scotland. They could help to improve incentives and outcomes by comparing supplier performance by region and encouraging suppliers to work together in specific locations in order to improve efficiency and speed up installations. Strengthening Guaranteed Standards of Performance (GSOPs) around smart meters could also help improve consumer confidence and encourage uptake more generally.[10]

Behaviour change

Key Finding 3: Financial incentives are key to changing energy use behaviours, but the levels of gain are limited by access to LCTs.

Over half (55%) of respondents agreed that their households want to use products and services that help reduce carbon emissions, and the majority of respondents expressed a willingness to shift some of their appliance use to off-peak times of day.

Financial incentives were important in terms of behaviour change. The research tested households' willingness to shift their usage in response to illustrative annual savings levels from £50-£200. 79% of respondents said they would be happy to shift their washing machine use to an off-peak time for the highest level of saving offered (£200). The number of respondents indicating a willingness to shift washing machine use decreased with lower savings. However, 16% of peak time users said they would be willing to move their washing machine use to 'off peak' times for no financial incentive. It is important to note that realistically, achieving a £200 annual saving over the course of a year would likely require a household to own an EV, and would not be possible just by shifting home appliance use.



Recommendation 3: Be clear with consumers about the benefits of various forms of energy demand flexibility, as well as the wider purpose and benefits.

Consumer advice and third sector bodies can play an important role in providing an independent source of advice around energy demand flexibility products and services to consumers. This could include details on the different types, how they work and the indicative levels of benefits (and potential costs) based on access to technologies, tariffs, and usage. This needs to be adequately resourced by UK and Scottish Governments, who can also coordinate to drive wider public engagement around energy demand flexibility, providing further clarity around its purpose and benefits.

Regulatory frameworks designed and implemented by Ofgem can also help ensure that information provided to consumers by suppliers, flexibility providers and other third parties around how to engage with energy demand flexibility through the particular products and services they offer – including through turn-up and turn-down events - is accessible, accurate and transparent.

Key Finding 4: Consumers have concerns around automation, which is viewed by many in the sector as essential to scaling up consumer-led flexibility.



There is a growing evidence base that automating consumers' energy use to take advantage of cheaper prices and reduce pressure on the grid, for example, through third parties controlling EV charging or home heating, can help scale up consumer-led flexibility.[11,12] Automation can make it easier for more consumers to participate in energy demand flexibility and the process less reliant on consumers remembering to manually shift their use.

However, this research found that many respondents would be uncomfortable with a third-party managing their electricity use. Between six and seven in ten said they would be uncomfortable with a company controlling their washing machine, home heating and dishwasher use. Respondents who already owned one or more LCT were nearly twice as likely to be more comfortable with automation compared to average. Those with children and under 35 were also more comfortable with the idea of automation.

Addressing consumer concerns around automation - for example, a perceived loss of control, or ability to override third-party control - is critical if it is to fulfil its potential in enabling greater consumer-led flexibility and delivering positive gains for a wide-range of consumers in terms of convenience and cost. [13, 14, 15, 16]

Recommendation 4: Ensure robust, enforceable regulation that protects consumers but also enables them to retain agency and control

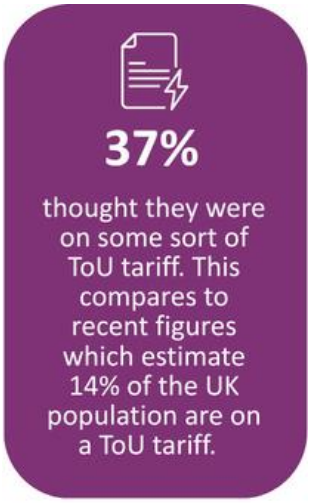
Ofgem and the UK Government should continue to work to implement the necessary regulatory frameworks. For example, for load controllers (that turn appliances on and off at specific times), energy smart appliances and the Consumer Consent Solution (CCS) (allowing consumers to control the sharing of their energy data with third parties). Regulation should be sufficiently robust, allowing the regulator to take swift and appropriate action where necessary, and afford clear routes to accountability and redress for consumers. Consumer outcomes should be continually monitored, with a particular focus on vulnerable groups.

It is important that alongside regulation, the design of products and services by providers and manufacturers enables consumers to retain control over automated services based on their evolving needs and preferences.

Time of Use (ToU) tariffs

Key Finding 5: ToU tariffs are not well understood, and consumers are unclear about if and what type of tariff they are on, and whether a ToU tariff would work for them.

Just over a third (37%) of respondents thought that they paid different amounts for their energy depending on when they used it. This compares to recent research that suggests that 14% of households in the UK are on a ToU tariff.[17] Of the respondents that said they pay different amounts for energy depending on the time of energy use, 22% could not identify what type of tariff or meter they were on.



The stated likelihood of respondents currently not on ToU tariffs moving to one was low, with 38% reporting they were unlikely or fairly unlikely to do so, compared to 17% saying it was very likely or likely. The most common reasons given for not moving were financial, with 24% reporting that there was no guarantee they would save money and 20% saying they were unclear on how much money they would save.

The general uncertainty around ToU tariffs is also reflected in research undertaken as part of Consumer Scotland's Energy Affordability Tracker, which finds that a significant proportion (39%) of respondents did not understand very well or at all what flexible use tariffs are used for and when you can use them.[18] This is not a new phenomenon, research over the past decade or more has demonstrated that many households, understandably, do not want to dedicate time to understanding complicated tariff structures and would like something simpler and more transparent.[19, 20, 21] This will be a major hurdle to overcome if there is to be widespread uptake of flexible tariffs.

Recommendation 5: Support consumers to make informed choices about ToU tariffs

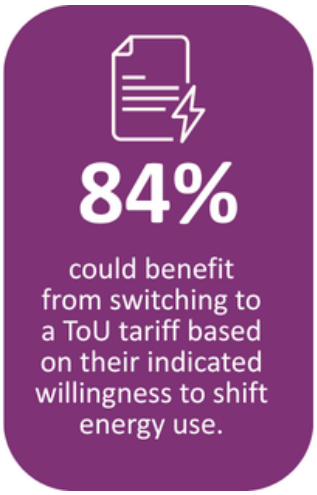
Ofgem's new outcome-based regulation and planned third-party intermediary (TPI) regulation offer important opportunities to ensure that consumers are being provided with the necessary information on individual tariffs and comparisons between tariffs to make confident and informed choices on what is the right tariff for them, whether that's time-based or otherwise. Clear and consistent billing will also be important so consumers can continue to review the appropriateness of the tariff they are on and inform decisions on potential switching.

As highlighted in Recommendation 3, consumer, advice and third sector bodies can also play an important role in providing independent and trusted advice on flexibility products and services including ToU tariffs. It would make sense to integrate this type of advice and support with that

provided around the uptake of LCTs, including through programmes such as Home Energy Scotland.

Key Finding 6: Switching to a ToU tariff combined with shifting electricity use to off peak times can save money on energy bills, but levels of savings are dependent on access to technologies.

Analysis was carried out to estimate whether a household would be better off on a ToU or fixed-rate tariff based on their current use of dishwashers, washing machines and tumble dryers and their willingness to shift a level of that use to off peak times. It also explored the average annual savings of flexible energy use combined with a ToU tariff by capability group, age, tenure and heating type. The results produced from this analysis are indicative as they are based on a number of sizeable assumptions on self-reported usage, willingness to shift usage and approximations of appliance(s) kWh energy usage, as well as not representing respondents' full household energy consumption. However, they do provide a broad estimation of the potential scale of energy use that could be shifted from peak to off-peak hours and the proportion of consumers who could benefit as a result.



Based on current appliance usage, 59% of those currently on a fixed-rate tariff could potentially be better off on a ToU tariff. A majority of consumers (84%) could potentially benefit from switching to a ToU tariff based on their indicated willingness to shift energy use. These benefits were broadly distributed across all demographic groups.

Of those households who would benefit from switching to a ToU tariff based on indicated willingness to shift energy use, which was the vast majority, the average annual savings were relatively limited at around £42. This underscores the point that without access to LCTs such as EVs, solar PV, batteries and heat pumps, greater shifts and savings are not possible. And without these, the incentive for consumers to flex their energy use is limited. As a comparison, recent research by the Energy Saving Trust found that by combining a heat pump, battery and solar panels with the right tariff, a household could cut energy bills by around £800 a year.[22] With access to LCTs enabling the biggest demand flexibility shifts and gains, it also points to where disparities and inequalities could emerge between different households based on income, tenure and other factors.

Recommendation 6: Understand and shape the distributional impacts of ToU tariffs and wider energy demand flexibility products and services.

Governments, consumer and advice bodies, academics and others need to work together to develop a more robust evidence base on the distributional impacts of ToU tariffs in combination with other types of energy demand flexibility products and services. More broadly, the continual monitoring of the potential winners and losers from planned and potential future interventions on energy demand flexibility is essential, and evidence used to shape outcomes.

UK Government and Ofgem should continue work to design robust and integrated regulation that incentivises suppliers and flexibility providers to design tariffs and other products that can enable different consumers with different capabilities to benefit from energy demand flexibility. Longer-term they will also need to consider how the energy price cap should evolve as more and more flexible tariffs come on to the market and how the outcomes of processes such as Ofgem's Cost Allocation and Recovery Review are implemented to enable the fair distribution of energy system costs and benefits.

Conclusion

The way we use electricity now and in the future is changing rapidly, with the potential to increase consumers' access to affordable and sustainable energy. In line with multiple other research reports that have been published recently, this research underscores the need for action to ensure that the benefits of energy demand flexibility and of a smart and secure electricity system are fairly distributed. [23, 24 , 25, 26]

It is clear that without the right framework in place certain groups stand to lose out due to factors beyond their control, most notably their inability to afford the devices that will enable them to flex their demand. The UK and Scottish Governments, and Ofgem, should be thinking ahead to how policy and regulatory frameworks will maximise access to the devices that enable consumers to be flexible, incentivise those who can flex to do so, and protect those who can't.

Without action from across UK and Scottish Governments, Ofgem, NESO, suppliers, consumer and advice bodies and others, certain groups of consumers in Scotland could be left paying for creating a smarter and more secure electricity system without enjoying any of the benefits.

It is important that consumers in Scotland understand the end goals of demand flexibility and are enabled to contribute to and benefit from their pursuit and achievement. Ensuring this could help unlock progress towards multiple policy ambitions at Scottish and UK-wide levels, including around fuel poverty, heat decarbonisation, and net zero.

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