

Written evidence submitted by Dr. Nick Hughes (Senior Research Fellow at University College London Institute for Sustainable Resources) (EPM0020)

The Business, Energy and Industrial Strategy Committee Inquiry into Energy Pricing and the Future of the Energy Market

Written evidence submitted by Dr. Nick Hughes, UCL Institute for Sustainable Resources

31st January 2022

The following submission represents the views of Dr. Nick Hughes, an academic researcher at the Institute for Sustainable Resources, University College London (UCL). Dr. Hughes has broad expertise in low carbon energy policy and transitions, having published articles, reports and advice on a range of topics including innovation for net zero, renewable electricity systems, electric vehicles, carbon capture and storage, and hydrogen. The submission focusses on the following theme from the Call for Evidence:

- **The role of retail market reform in the context of the UK's net zero transition and domestic energy security requirements.**

A. Executive summary

This submission notes and agrees with the Government's commitment in the Net Zero Strategy to consider reforms to electricity market frameworks, and to the retail market specifically. It explores the reasons retail market reform is needed in the context of the UK's net zero transition and domestic energy security requirements, and considers possible forms such reforms could take. It offers the following suggestions of general principles by which any reforms should be guided.

A.1. Retail market reform should consider how to access the full potential of demand side response, as part of delivering a zero-carbon and secure electricity system at least cost.

A.2. Reforms will need to ensure there is sufficient incentive to create innovations in demand side response, and that the rewards for the resulting system benefits are fairly shared between all participating actors.

A.3. Reforms should consider the potential need for new types of actors, or for existing

actors to take on new roles, such as energy service companies. The increased interaction between energy services and data management should also be considered from a regulatory perspective, in order to enable benefits while protecting customer privacy.

A.4. Reforms should also consider impacts of different groups of customers, especially low-income groups, who may be “time-poor” and hence at greater risk of being penalised for not being able to take part in load shifting.

B. The role of retail market reform in the context of the UK’s net zero transition and domestic energy security requirements.

B1. The Government’s Net Zero Strategy acknowledges the need to consider broader reforms to the existing electricity market frameworks, and to the retail market specifically¹. The Climate Change Committee has also called for such a review “without delay”².

The UK’s net zero target, and the related interim carbon budgets, require full decarbonisation of electricity supply, with renewables playing a leading role. However, as well as delivering decarbonisation, this transition must also prioritise cost-effectiveness. This includes paying attention to overall costs, and the fair distribution of those costs in a way that doesn’t unfairly burden those on lowest incomes. The transition also requires careful attention to maintaining security of supply – although the challenges to security of supply are different under a renewables-led system compared to a fossil-led system.

A previous round of Electricity Market Reform, leading up to the Energy Act of 2013, introduced amongst other measures, long-term contracts to support low carbon electricity generation. Such forms of support have helped to incentivise investment and drive down the cost of capital for renewable projects. These, and similar policies elsewhere in the world, have contributed to reducing the costs of renewables globally, meaning that they are now highly competitive with fossil fuels on a levelised cost basis³.

As a result of this progress, replacing fossil fuel generation with renewables could present considerable opportunities to maintain lower costs for consumers, and to avoid the price-volatility inherent in global fossil fuel supply chains⁴.

However, a renewables-led system could introduce other kinds of volatility with related price risks, for example during periods of low output due to low wind speeds.

¹ HM Government (2021) Net Zero Strategy: Build Back Greener, pp. 101-102

² CCC (2021) Independent Assessment: The UK’s Net Zero Strategy, p. 30

³ IRENA (2021) Renewable Power Generation Costs in 2020. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Jun/IRENA_Power_Generation_Costs_2020.pdf

⁴ Alvarez and Molnar (2021) What is behind soaring energy prices and what happens next? IEA. Available at: <https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>

Addressing these kinds of volatilities will require investments in storage, and in low-carbon baseload and flexible peaking plant, with potential roles for technologies including batteries, CCUS and hydrogen. But trying to incentivise greater flexibility on the demand-side, so that consumer demands are shifted away from periods of low renewable electricity output, and towards periods of high output, could make an important contribution to addressing the challenge of supply-demand balancing in a cost-effective manner.

Therefore, the flexibility offered by measures such as demand-side response should be considered a crucial tool to support the full decarbonisation of the electricity sector⁵.

Recommendation: Retail market reform should consider how to access the full potential of demand side response, as part of delivering a zero-carbon and secure electricity system at least cost.

B2. There is a range of different possible approaches for incentivising and rewarding greater demand side flexibility. The increased adoption of time-of-use pricing tariffs would be one such approach. According to this approach, the exposure of consumers to real-time costs would encourage them to make behavioural choices about when to schedule domestic energy demands such as washing loads or recharging of appliances. The development of “smart” technologies could enable such responses to be increasingly automated, potentially increasing convenience to consumers, provided they were accepting of relinquishing some autonomy in their home, and potentially sharing data. The evolution of the energy supplier into an energy service company could be conducive to enabling consumers to access the full range of such solutions.

Recommendation: Reforms will need to ensure there is sufficient incentive to create innovations in demand side response, and that the rewards for the resulting system benefits are fairly shared between all participating actors.

Recommendation: Reforms should consider the potential need for new types of actors, or for existing actors to take on new roles, such as energy service companies. The increased interaction between energy services and data management should also be considered from a regulatory perspective, in order to enable benefits while protecting customer privacy.

B3. However, it is also important that such novel approaches do not have adverse social impacts. Achieving this balance will be an important aspect for retail market reform to consider. For example, some energy-using activities are time-critical, at which times consumers would be unable to escape high prices under a straightforward time-of-use pricing approach. Furthermore the impacts may be unequal, as personal, employment, and living circumstances, may give some consumers much less flexibility to load-shift than others. Low-income consumers who were “time-poor” might be particularly vulnerable to such a trap⁶, and hence would be penalised by high prices due to a supply-side dynamic

⁵ Strbac et al. (2020) Role and value of flexibility in facilitating cost-effective energy system decarbonisation. *Progress in Energy*.

– low renewable output – which is entirely beyond their control. At the same time maintaining some kind of price signal is important to provide incentives for efficient use of energy, and for ensuring that heavy energy users pay their fair share.

One of the characteristics of the transition to a renewable system is of a shift from a system dominated by operational costs to one dominated by capital costs. This was one of the reasons for the supply-side focussed electricity market reform of 2013 to introduce long-term energy contracts, in support of long-term high capital cost investments. An analogous move in the retail sector is towards a “bandwidth” model of payment for energy services. This would involve a movement away from payment per unit of energy, and towards an arrangement where consumers contract with retailers for a certain energy bandwidth, conducive to their needs.

Energy suppliers, or energy service companies, would still compete with each other to offer the lowest overall cost contract to consumers. One of the ways they could do this is by finding innovative ways of meeting their customers’ energy service needs within a smaller bandwidth – such as investing in appropriate smart or load shifting technologies within the customer’s home, or in distributed storage to capture renewable energy at times of low demand and use it to meet any demand that exceeds their customers’ contracted bandwidth during peak times.

Such an arrangement would break the link between domestic customers and exposure to high-priced energy periods that occur due to factors beyond their control. Rather, the onus would be on retailers, suppliers, and other innovative intermediary actors to develop the short and long term measures to balance supply and demand.

The above descriptions are illustrative of possible options. However, whatever approach is pursued, impacts on different groups of customers, including the most vulnerable, should be considered.

Recommendation: Reforms should also consider impacts of different groups of customers, especially low-income groups, who may be “time-poor” and hence at greater risk of being penalised for not being able to take part in load shifting.

Acknowledgments

This response has been prepared by Dr. Nick Hughes of the UCL Institute for Sustainable Resources. I would be pleased to speak further about this response

January 2022