

Energy Security and Net Zero Committee Inquiry Economics of the energy sector

Response from UCL Institute for Sustainable Resources

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The UCL Institute for Sustainable Resources' mission is to provide evidence, expertise and training to respond to climate change and support sustainable transitions for people and planet.

We would be delighted to discuss this consultation, or any of our other work. Please contact Katherine.page@ucl.ac.uk

Two reports we have previously published with the Aldersgate group may help to add further background to this response:

- [‘A zero-carbon power grid and the electrification of heavy industry: how to deliver on a twin challenge’](#)
- [‘The Case for a Social Tariff: Reducing Bills and Emissions, and Delivering for the Fuel Poor’](#)

1. What should be the underlying principles of the UK energy market?

It is important to recognise, as set out in a previous submission to the Competition Markets Authority (CMA),¹ that the energy sector is economically unusual. Energy does not act like other products, there are no substitutes for the electrons or methane you consume, and consumers do not interact with the market in the same way as other sectors leading to a traditionally low level of engagement. This means that traditional economic approaches can be misplaced.

The energy sector has always been subject in one way or another to the structure of government regulation, for multiple reasons around the nature of energy as a product and its dependence upon large monopoly networks. Energy markets have never delivered an optimal level of innovation independently of government intervention.

In the first instance, we need a pragmatic approach to the economic understanding of innovation in energy systems, which are crucial to net zero.

There are three pillars which form a framework for effective policies (a more thorough explanation can be found in the CMA submission):

- Understanding competition and getting the pricing right.
- Understanding and responding to multiple barriers around consumer engagement, which mean that competition through markets by itself will not adequately protect consumers.
- Strategic investment from government, for innovation, security of the system and to reduce emissions. The government cares about the direction of investment in the system to be in accordance

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[https://assets.publishing.service.gov.uk/media/553e273640f0b6158900003d/Prof. Grubb of University of Central London.pdf](https://assets.publishing.service.gov.uk/media/553e273640f0b6158900003d/Prof._Grubb_of_University_of_Central_London.pdf)

with the UK's commitments to medium- and long-term climate targets, including reaching net-zero emissions by 2050.

2. Can Government deliver radical reform in the UK energy market?

This answer to this question depends on the government's commitment to such reform.

10 years ago, in 2013, the government did deliver radical reform in the face of opposition. It is that reform, the Electricity Market Reform (EMR) of 2013 that laid the groundwork for the progress we've seen in renewables deployment. So bold governments can implement and have implemented radical reform.

However, we are far from convinced that the current Review of Electricity Market Arrangements (REMA) package offers the radical reform necessary. It seems to project the assumption that because the last package (EMR) worked for the first stage of this transition, that it's still the right basic structure for the next phase. We are not convinced that is correct.

Within the REMA document, the government has made a specific choice to pursue an evolutionary rather than radical approach.

3. Is the Review of Electricity Market Arrangements likely to deliver the necessary changes to the energy sector?

We are currently putting together our response to the REMA consultation, which we can send to the committee once we have completed it (deadline 7th May). Without wanting to pre-empt the content of that submission, we have some general reflections.

We are increasingly thinking that the current direction of the REMA programme is unlikely to deliver the necessary changes.

Getting renewable energy working is central to a low carbon future. What worked to get the renewables industry going at scale when it was, in economic terms, still very much a minor part of the system is very different from what's required to make best use of the resources as renewable energy becomes a major part of the system.

The biggest reason for this difference is that we now have the challenge of increasing periods with surplus renewable energy generation. If that is all sold through the wholesale market under the current model then it will rapidly lead to growing problems such as negative prices, and indeed could deter the investment that's needed.

There is also the challenge of cold periods with insufficient renewables, requiring the provision of long-term energy storage, necessitating capacity to store renewable electricity when it is in surplus. While the capacity market was a useful instrument during the transition away from coal generation, there is now an increasing danger that it may subsidise the development of further gas capacity. The operation of new gas will be incompatible with emission targets, and may deter investment in long-term storage technologies for renewable electricity. Simultaneous government messaging that new gas will be necessary sends a mixed signal to the market about the investability of those long-term storage options.

Overall, we are concerned that the direction of travel is not towards a system which will give the best incentives to develop long-term storage. Thus, missing a crucial part of the puzzle for delivering net zero.

4. What are the major benefits that the UK should be seeking to deliver from energy market reform?

The government should be pursuing efficient and accelerated investment in renewable energy, grid upgrades and energy storage at low financing costs.

Over time, given there will be increasing number of capital stock generators which cost almost nothing to run, there should be a significant price saving for consumers – and, therefore, a macroeconomic benefit for the UK. However, there is still work to do to ensure that this lower cost from renewables gets passed along to households and businesses.

The government also needs to ensure that consumers get the benefits of flexibility in their electricity use if they so choose.

The REMA consultation mentions a second piece of work on retail markets, which could be better integrated into the policy reform process. Any energy market reform should include the retail market, and this should include increasing the accessibility of technologies for flexibility.

5. What are the chief barriers to reform of the energy market and is the Government serious about addressing those?

A key aspect not currently integrated into the governments thinking is the need to combine the consumer and generation perspectives.

Although there have been discussions about consumer flexibility, the lack of integration is reflected in the split strands of electricity market reform and retail market reform.

So, the traditional distinction of supply side versus demand side is still a problem. That, in turn, will limit the potential for meet overall policy objectives in the most effective way.

There is also the tendency towards national planning when we may need more regional and bottom up thinking about the evolution of the system. This is partly addressed through REMA's consideration of zonal pricing, but that is being viewed to some extent as driving top-down efficiencies rather than bottom-up engagement possibilities.

Other barriers include a historical reluctance to engage in elements of strategic planning in the direction of the system. However, there is a move to addressing this through the creation of NESO.

There are also regional energy system planners, as proposed by Ofgem.

Consumer awareness is also a problem, and it would help if citizens understood the system they're depending on, the way that it can evolve and the opportunities that could offer.

Finally, there is an overreliance of the system on a short term wholesale market as the central price setter for all electricity. This wholesale market model is very embedded, and it seems impossible for government to think beyond this.

6. Is it possible to ensure that consumers are insulated from market failures in the energy sector?

There is an inherent imbalance between consumers and the structures of the system we're creating.

In the first instance we would recommend a social tariff, as set out in our report with the Aldersgate group.² This could immediately shield the most vulnerable consumers from unusually high prices while longer term reforms are taking effect. It is also important to ensure accessibility of technologies such as smart meters, and energy efficient and flexible appliances to allow vulnerable consumers to benefit from flexibility.

Characteristics of the energy system have consistently shown that consumer interests cannot adequately be protected just by retail competition. For instance, vulnerable consumers who are unable to engage in shopping around for tariffs or different suppliers creates a system where not everyone can interact with the market in the same way.

Additionally, most tariffs exist on a short term basis, which is not an optimal structure for a system which is increasingly dominated by assets and the need for stable investment on the long term.

² [https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/report - the case for a social tariff - reducing bills and emissions and delivering for the fuel poor31.pdf](https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/report_-_the_case_for_a_social_tariff_-_reducing_bills_and_emissions_and_delivering_for_the_fuel_poor31.pdf)