



## Industry and Regulators Committee

### Inquiry: Ofgem and net zero

A joint UK Energy Research Centre and EnergyREV response

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## **About UKERC**

The UK Energy Research Centre (UKERC) carries out world-class, interdisciplinary research into sustainable future energy systems.

UKERC is a consortium of top universities and provides a focal point for UK energy research and a gateway between the UK and the international energy research communities.

Our whole systems research informs UK policy development and research strategy.

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## **About EnergyREV**

The Energy Revolution Research Consortium (EnergyREV) is a consortium of >60 academic researchers across 22 UK universities. We are part of the Governments' £100M Prospering from the Energy Revolution (PFER) Industrial Strategy Challenge Fund. The PFER programme aims to demonstrate:

*"...investable, scalable local business models using integrated approaches to deliver cleaner, cheaper energy services. This will lead to prosperous and resilient communities and benefit the energy system as a whole."*

EnergyREV works with the smart local energy system demonstration and design projects funded through the PFER programme. We undertake analysis and evaluation, building and driving best practice and, leading knowledge exchange through national and international engagement with policy, academic, industrial and public communities.



## Introduction and overview

1. This response has been prepared by experts from the UK Energy Research Centre (UKERC) and the Energy Revolution Research Consortium (EnergyREV). The focus of our submission is drawn from activities where our research provides insights. We welcome the enquiry and would be happy to provide additional information.
2. Our submission seeks to provide a pragmatic discussion of issues and it is important to note that there is not a 'right answer' to several of the questions the Committee have posed. In some cases, the key challenge is to choose an approach (for example the split of responsibilities between the government and regulator) and then ensure that best principles of good governance are followed so that the arrangements chosen work effectively. In what follows we illustrate how the role and remit of the regulator will change if the mix of competition and planning shifts, ultimately a political choice. We also highlight the need to see 'least cost' in a broad context.
3. Notwithstanding all of this, the net zero target has fundamental and far-reaching implications for the energy sector. The scale and pace of the changes needed are completely unprecedented. A regulatory framework designed for a largely static environment where markets and networks change incrementally may not be right for a context of transition and transformation. As result, we do not believe that the regulator can continue on the basis of 'business as usual'. The challenge of net zero needs to be reflected in Ofgem's principal objective and in the way in which the balance of objectives are described and conceived.

## Evidence in response to the Committee's questions

### Question 1: What role should Ofgem play in the transition to net zero? What changes, if any, should be made to its remit, responsibilities and resources?

4. Our answer to this question is provided in two parts. The first considers the situation as it is today and asks whether any immediate changes should be made to Ofgem's remit. The second takes a slightly longer view and considers the role of Ofgem going forward, making the point that the mix of markets, planning and regulation affect what is needed from a regulator.
5. Part 1: Current remit
6. Ofgem currently acts on behalf of the Gas and Electricity Markets Authority (GEMA) and is tasked with regulating and overseeing the UK's gas and electricity networks. By enacting price controls and regulations, it aims to achieve its principal objective of protecting '*the interests of existing and future gas and electricity consumers*'. Activities include the regulation of monopoly networks, promoting competition and regulating competitive markets, and managing various energy sector social and environmental programmes. These additional responsibilities were far more limited when Ofgem was originally set up in 2000, following the merging of gas and electricity market regulators. The remit of Ofgem has grown, from one of a 'simple' economic regulator to a role that encompasses many additional functionalities.
7. In 2008 the Climate Change Act committed the UK to binding targets to reduce greenhouse gas emissions and in 2019 the target was made more ambitious, committing the UK to net zero greenhouse gas emissions by 2050. Hereafter we refer to this as 'net zero'. The net zero target has far reaching implications for every aspect of energy generation and use, across both gas and electricity sectors. It requires that electricity generation is decarbonised and is very likely to require that heating and transport energy are largely electrified. Many associated changes will also be required. These are numerous but include enhanced energy efficiency, greater participation of demand side actors in energy markets, more interconnection, and impacts on both local distribution and long-distance transmission.
8. This represents an unprecedented challenge and uncharted territory for government and regulator, industry, and consumers alike. The pace of change needed is very rapid relative to historical norms in the energy sector and means that we must respond quickly. Ofgem has a diverse array of duties and issues it must manage within this context, which will inevitably lead to complex decisions and the need to balance a number of factors. There has always been a need for balance but historically this is set against a context of incremental changes to a mature electricity and gas system. The context now is transformative change of both. This changes the trade-offs and creates new uncertainties, for example about future costs.
9. There are a range of possibilities and a variety of views regarding how broadly defined Ofgem's role could be – ranging from that of a wide remit to cover

functions such as achieving net zero and ensuring fairness, to a remit with a narrowly defined economic focus. We consider these in the second part of this answer. However, given the wide-ranging implications of the legislative target for net zero it appears appropriate that Ofgem's principal objective should be amended to reflect the importance of this target. An illustrative formulation is as follows: *The Authority's principal objective is to protect the interests of existing and future consumers **as the UK transitions to net zero energy systems.***

10. The precise formulation or wording of this objective can be debated. However, promoting net zero into Ofgem's principal objective will help to ensure that limiting greenhouse gas emissions and achieving other objectives are not in competition. It enables a discussion regarding how a net zero energy system can best meet other objectives such as cost, security of supply and consumer vulnerability. We return to these issues in the answer to Q2.
11. Currently, the roles and responsibilities of the various system actors (government, Climate Change Committee (CCC), system operators) are fairly clear. However, a significant gap in the current governance architecture is responsibility for long-term system planning, and the links between generation contracts (Contracts for Difference, Capacity Mechanism), network planning and operation. Long-term planning need not be the responsibility of an independent regulator; what is required is greater strategic direction for Ofgem in these areas. To some extent, the long-term network planning and operation aspects have led to the proposal to create an independent Future System Operator and creation of Distribution System Operators. It is important that the relationship between system planning and regulation becomes more formalised and transparent.
12. Regarding planning at the regional level, the gas and electricity distributors already have a statutory duty to develop integrated resource plans in line with national decarbonisation targets and according to a common methodology. Given the increasing proliferation of distributed energy resources, uncoordinated development at this level will likely result in higher network costs and potentially connection delays. Current company level business RII0-2 plans are of varying ambition and quality, while efforts at coordination and optimisation across electricity, heating and transport sectors are limited and ad-hoc. Government, the CCC, the Energy Networks Association and local authority representatives should initiate a dialogue about moving toward such a planning approach, while Ofgem's current role is to ensure that the plans are delivered at least cost. Researchers within UKERC are currently [developing regional optimisation modelling frameworks which could be used in such an exercise](#).
13. Part 2: Wider issues affected the role of and need for a regulator
14. The wider role of Ofgem, regarding its power and duties, is dependent in part on how future energy system governance is configured. Given the complexities of the energy system and energy policy, it would be possible to configure governance of the energy system in a number of different ways, with the boundaries and responsibilities variously drawn between the regulator, government, the system operators and other participants. Some argue for new institutions to be introduced, such as an Energy Transition Commission.

15. The mix of agencies required for future governance, in particular the role and responsibilities of Ofgem, depend to some extent upon the overarching principles guiding the energy system net zero transformation. In what follows we provide a simplified view of the relationships between the role of markets and planners in the transition to net zero. This shows how the role of the regulator is affected by higher level political choices.
16. One key variable affecting governance is the extent to which competitive energy markets in Britain are retained or not. We describe three highly simplified scenarios for the mix of regulation and competition. In *Scenario 1; competitive energy and carbon markets*, competition is to be retained as the cornerstone of energy policy, with markets (carbon and energy) and prices as the driving forces of system change towards net zero. In this instance there will be a need for an independent, economic regulator in a similar guise to the current Ofgem. In this competitive market scenario, the main functions of the regulator would continue to be entry and price regulation for the networks, ensuring diversity in the market, that market power is kept in check, reducing barriers to entry into the wholesale and retail markets, and that customers are not discriminated against by retailers, etc.
17. In an alternative scenario (*planning-lite*), centralised planning and government-backed contracts play key roles in a net zero transition, but within the existing industry structures. The role of Ofgem in such a scenario could vary – from being responsible for the delivery of many of the contracts to an independent regulator in a more limited form. The limited form would be focused on network price controls and retail markets. The role in generation markets will depend on how much of the supply of electricity is delivered through government-backed long-term contracts and how much through wholesale energy markets. In the extreme, Ofgem staff covering generation and wholesale markets could be best redeployed to BEIS, or another entity responsible for generation planning and investment. Ofgem’s network regulation role will continue but the regulator would need to be provided with more strategic direction from BEIS (or other statutory system planning entity).
18. It is important to note that ‘planning lite’ does not abandon markets. As in the current arrangements for Contracts for Difference (CfD) and the Capacity Mechanism (CM), market processes and private capital still drive the deployment of energy technologies. With appropriate contestation, through market creation and auctions, it is possible to lower costs. However, in this scenario policy approaches focus largely on schemes that minimise the cost of capital in capital intensive projects, by removing electricity wholesale market price risks.
19. In a *planning-led* scenario, we imagine far greater vertical integration across generation, networks and supply, and a planned approach to heat decarbonisation, and to vehicle charging. It is possible even to imagine that generation and retail market competition gives way to a return to price regulation and a large element of centralised planning. As with *planning light* it is important to note that markets and private investment need not be abandoned, since contracts to deliver generation or networks could still be contested. Such a

scenario could be overseen by an independent agency – perhaps such an agency could subsume Ofgem. However, in such a scenario the function of the energy regulator would be limited to network price controls and could possibly be subsumed into a cross-sector utility regulator covering telecoms, water, and energy.

20. It is important to note that the scenarios are illustrative and within both UKERC and EnergyREV there will be a range of views as to which mix of approaches are best suited to meeting policy goals. Ultimately, the mix of competitive markets and central planning will depend upon political decisions. Our main point here is that the future role and responsibilities of the energy regulator are contingent upon the relative roles of energy markets, capacity auctions/contracts, regulation, competition and planning. Hence what sort of regulator we need is a product in part of the political philosophy that guides the net zero transition.
21. If the remit of Ofgem is narrowed other entities must take control of some of the wider responsibilities, as discussed above. An alternative would be to broaden Ofgem's role, as long as there is a clear primacy of objectives. It is important to avoid a situation where it is not clear who is responsible for deciding future energy governance principles and assigning roles and responsibilities, and via what process.
22. We do not believe that is possible, or helpful, to provide a definitive statement of the 'right' share of responsibilities between the different actors in the governance system. Looking around the world it is clear that there is a range of approaches. In some respects, the key requirement is to ensure that whatever system of governance is chosen it is made to function well. Key concerns include ensuring roles and responsibilities are clear, that all agencies are adequately funded and skilled, minimising conflicts of interest and maximising transparency.

**Question 2: How well does Ofgem balance environmental objectives against its responsibilities in relation to affordability for consumers?**

23. Ofgem already has a responsibility for future consumers as well as current ones, even so focusing on delivering activities at 'least cost' operates as a constraining factor. It could be more appropriate to focus on delivering activities at 'reasonable and efficient cost', to allow activities and investments to consider wider aspects such as customer/citizen values and preferences.
24. One reason for this is that pathways that are consistent with legislated net zero targets are likely to see highly significant changes to demand for electricity. When these changes will take place and how quickly is uncertain. If 'least cost' locked us into today's solutions, then we would not see the incremental change required - locking into least cost options in 2002 would not have permitted the policies that have been so successful in reducing the cost of renewables, particularly offshore wind.

25. The role of Ofgem could therefore be to ensure that national policy goals are delivered at *reasonable and efficient cost*. Efficient pricing should be the core mechanism to achieve this 'reasonable cost' objective (through network charging frameworks, price controls and monitoring competition in retail markets), whilst ensuring that network companies are financially viable.
26. With regards to broader societal aspirations and objectives there needs to be a balanced view of cost, as taking a narrowly defined, least cost approach to complex challenges may lead to sub-optimal solutions. An alternative would be for a different entity to take on that role, with the role of Ofgem remaining within that narrowly defined as an economic regulator. So another institution focuses on the pathway to achieve net zero and Ofgem is charged with ensuring that it is delivered cost efficiently.
27. This narrow least cost objective needs to be considered within the constraints of ensuring an acceptable level of service quality, in line with customer preferences, and any government policy objectives that may require cross-subsidies, such as protecting vulnerable customers or supplying isolated communities. As discussed in our answer to question 1, whilst not part of Ofgem's current legislative role, we suggest that net zero should be included as a constraint. This varies from its present role where 'net zero' is competing with other objectives (Hardy, 2021). It is recognised that meeting net zero will need significant investment in new technologies, flexibility services and grid reinforcement (Strbac et al., 2020). Working within the mentioned constraints Ofgem would ensure that transitioning to a net zero energy system was being achieved at reasonable and efficient costs to the consumer, thereby protecting current and future customers and ensuring a fair and just transition.

**Question 3: How well does Ofgem fulfil its obligations to consumers? Does Ofgem take consumer views into account sufficiently, particularly those of vulnerable consumers?**

28. Whilst it is relatively easy to research the needs of current consumers, it is much harder to define these for future consumers. This can skew activities towards current consumers, leading to intergenerational equity issues. There is a need for more research into how we understand and develop future insights, which would generate win-wins for both current and future consumers. Sustainability First, together with Frontier Economics have recently proposed a "A Framework for Assessing Intergenerational Effects of Decarbonisation and Climate Adaptation", as a starting point (Bell et al, 2021).
29. UKERC research (Demski et al, 2019) has shown that the British public has widespread support for an energy system that ensures affordability, reliability and low carbon energy sources. The research indicates that they are willing to contribute financially if they perceive that energy companies and government are also contributing financially and showing real commitment to energy system change.



30. In principle we welcome Ofgem's increased focus on customers in RIIO2 through its Enhanced Stakeholder Engagement Guidance, which has allowed a much broader customer base to be reached (Ofgem, 2019). As energy systems become more decentralised, new stakeholders and customer propositions are introduced so creating a more diverse system (Bell and Gill, 2018). By incentivising the networks to focus on their customers, the heterogeneity of customer issues, including vulnerability, across regions is seen and company investments can be tailored to a particular area or need. We also welcome the challenge applied to the networks' investment strategies through the Customer Engagement Groups (CEGs) and Ofgem Challenge Group to ensure that Business Plans meet the needs, values and preferences of all their customers, including harder to reach and future customers. However, due to the complexity of the plans, it should be the role of the regulator to scrutinise cost efficiencies in comparative context.
31. Whilst Ofgem incentives have proved effective in orienting the companies to engage with customers and stakeholder groups, there are questions about the economic costs and benefits of these investments. Whilst some companies change their plans on the basis of this engagement, it is hard to know if this applies across the board. If company business plans have been created and challenged based on enhanced customer engagement then as an economic regulator, Ofgem's role should be to benchmark costs and assess investment efficiencies, not to make decisions on individual company investment proposals (e.g. Madhura, 2020).
32. There remains a question whether greater efficiencies might be gained from centrally managed assessments of customer needs, preferences and ability to pay/affordability, with less replication of the same exercise across every company. We therefore welcome the continued discussions within the UK Regulators Network on the use of a cross sector database of needs and vulnerability data to improve outcomes for vulnerable consumers.
33. There are also significant 'hard trade offs' in current DNO RIIO-ED2 business planning between investing now for the future/'ahead of need' and impact on low-income customers. For example, the cost of investing in distribution networks to assure reliability and resilience for the anticipated take up of air source heat pumps and electric vehicles among affluent areas will also fall on low-income households less likely to benefit from such investments. The use of tax revenues could be one alternative, which would fit with more planning-led energy systems investment.

**Question 5: Is Ofgem's current system of price controls appropriate? Does it provide sufficient incentives to invest in the context of the transition to net zero?**

34. The current system of price controls is an improvement on the previous system that only factored in retail price increases (RPI-X). However, it is still focussed principally on improving efficiency via reducing costs. Rather than RIIO being

new, it has layered some new incentives on to the original RPI-X framework<sup>1</sup> creating more complexity (e.g. Lockwood, 2016), which still gives companies an opportunity to game the price control (e.g. Poulter, 2017; Wild, 2017). We agree that reducing costs is an objective of a price control, but as suggested in answer to question 2, there is a need for the focus on costs to be interpreted within a context that recognises the dynamic context of the transition to net zero. Some costs are uncertain. Network companies are an enabler of the transition to a net zero energy system and should be incentivised to deliver new and innovative solutions to net zero challenges by the most efficient means for the customer. RIIO introduced innovation into the price control framework and lessons can be learned from experiences in the first round. However, the need for ongoing innovation has not diminished and it is important for it to continue to be a strong area of focus. There is a risk that RIIO2 will get the balance between innovation and short-term cost reduction wrong, to the detriment of consumers in the longer run.

35. In RIIO2, there have been new incentives. We welcome the addition of Price Control Deliverables (PCDs), which reduce the ability to move shorter-term investment proposals between price controls to appear to be more efficient. Bespoke Output Delivery Incentives (ODIs) are also a welcome addition as these are based on companies' customer engagement, although we have some concern that ODIs may only be allowed if considered common across all companies (Ofgem, 2020b). As has been mentioned previously, change can be distinct dependent on regions/locales and therefore meeting net zero challenges may well have a distinct solution that may not be common across company areas.
36. We also question the benefits of the new Business Plan Incentive (BPI) to net zero. While we welcome the change from the 'fast-track' status and the initial quality penalty ensuring that the company is focussed on their customers, we think there is too much focus on rewards being achieved based on what Ofgem is able to benchmark. Earning an incentive requires the companies to have customer value propositions that go 'above and beyond' a benchmark, which Ofgem will create for the DNOs (missing from electricity transmission and gas transmission and distribution) and for the business plan to have more high- than low-confidence costs or incur a penalty<sup>2</sup>. As mentioned, meeting net zero will include innovative technologies and approaches (Bell and Gill, 2018) which Ofgem may have difficulty in benchmarking due to their distinct and innovative nature. The current BPI perhaps encourages companies to focus on less risky investments that have more easily justified costs to gain incentive rewards, than enabling riskier net zero innovation.
37. A final point is that Ofgem provided mechanisms within the RIIO-2 price control for strategic investment and for whole systems cooperation (for example

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<sup>1</sup> We do recognise that there have been improvements to the RPI-X type base framework e.g. moving from CAPEX/REPEX to TOTEX

<sup>2</sup> High confidence costs are those company's costs that Ofgem has high confidence in being able to benchmark against Ofgem's figures. Low confidence costs are where Ofgem has a lower confidence in Ofgem's own figures and so must trust the company's figures, which should then be robustly justified or incur a penalty.

between electricity and gas networks, or between energy networks and other sectors, such as water). Both these require the network companies' engagement with stakeholders. In the case of strategic investment, this requires engagement with local government and local actors to understand future ambitions and where strategic network investment unlock multiple benefits. In the case of whole systems coordination, this requires engagement to understand where investment in one network could unlock benefits for another. In both these cases, the evidence from the business plans to date is that the network companies have demonstrated limited ambition. Given the potential benefits that have been left off the table as a consequence, we think Ofgem should reflect on why these approaches have failed to deliver.

**Question 6: Is the current system of governance for the UK energy market appropriate to secure the Government's policy outcomes? What improvements could be made and what role should Ofgem play?**

38. Please see our response to Q1.

**Question 7: Are Ofgem's duties and powers appropriate and sufficiently clearly defined? Do Ofgem's objectives conflict and, if so, how should any conflicts be managed?**

39. Please see our response to Q1.

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