

LCH 14

Ymateb gan : Ofgem
Evidence from : Ofgem

1. Introduction

- 1.1 This is Ofgem's submission to the Climate Change, Environment and Rural Affairs Committee's inquiry into Low Carbon Housing: the challenge. This response focuses on the issues raised by the Committee that fall within our remit. Our response therefore focuses on information regarding the challenge, with respect to two key questions:
- What is the role of Ofgem and National Grid in enabling grid evolution to accommodate new types of housing; and
 - What are the challenges presented by decentralised energy supply?
- 1.2 We would be pleased to provide the Committee with further information if it would be useful.

2 About Ofgem

- 2.1 Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority, recognised by EU Directives. Our principal objective when carrying out our functions is to protect the interests of existing and future electricity and gas consumers. We do this in a variety of ways including:
- promoting value for money;
 - promoting security of supply and sustainability for present and future generations of consumers;
 - the supervision and development of markets and competition; and
 - regulation and the delivery of government schemes.
- 2.2 We work effectively with, but are independent of, government, the energy industry and other stakeholders within a legal framework determined by the UK government and the European Union.
- 2.3 As part of our role, we regulate National Grid, who is both the System Operator (SO) and therefore responsible for making sure the electricity system remains stable and one of the three Transmission Operators (TO) in GB.
- 2.4 We have set out principles for how we will approach regulation and our priorities for changing the current arrangements. We believe this approach will work in the interests of consumers and help progress towards decarbonisation.

The principles are as follows:

- **Aligning incentives**, so that monopoly network operators and National Grid as the gas and electricity system operator act in the interests of consumers.

- **Cost reflective charges for monopoly services** that reflect the incremental costs and benefits of how consumers and other parties use the system. This includes minimising harmful distortions arising from the recovery of residual charges for using the networks.
- **A level-playing field**, so that all technologies and business models can compete equally, without barriers to entry to the market.
- **Efficient allocation of risk**, so that those best placed to manage the uncertainty inherent in a rapidly changing system shoulder the risks involved.
- **Harnessing markets and competition** where it can bring benefits to consumers.

3 The changing network and grid evolution

- 3.1 Our energy system is in the midst of a significant transformation. The way energy is produced, generated, transported, stored and supplied to consumers is changing. This creates real opportunities for consumers to benefit from new services and technology and to get better value out of the energy system. The regulatory and market arrangements, as well as industry participants, need to respond to these changes to ensure that the energy system continues to meet the needs of all consumers.
- 3.2 Electricity market and regulatory arrangements were designed for a system with very different characteristics to those we now expect in the future. For example, more than a quarter of all generation capacity is now connected to distribution (often at the household level) rather than transmission networks. Much, but not all, is intermittent renewable generation, which only generates when the wind blows or the sun shines. In addition, an increasing proportion of generation is now located behind the meter on consumer premises, partly driven by the growth of solar panels.
- 3.3 These wider changes in the energy system, including; raising the sustainable standards of housing, the installation of generation at a household level and localised energy generation, are modernising our energy market. It is enabling novel business opportunities to develop in a way which benefits consumers and allows them to take an active role in their energy production and consumption.
- 3.4 Distribution Network Operators (DNOs) are responsible for managing their network efficiently. They have licence obligations to maintain efficient and economic networks and we can take action if they fail to deliver against these obligations. They are regulated over an eight-year period and we agree a price control settlement with them. In order to do this, the DNOs must present well-justified business plans to us to justify their expenditure. We expect DNOs to carry out extensive and ongoing long-term forecasting in advance and throughout the period, so that they can anticipate where investment will be required, for example, as a result of an increase in local demand and generation and where more capacity is needed on the network. Some of this capacity will be driven by new connection requirements, and some by increased levels of demand (e.g. as a result of electric vehicle take-up). Accurate forecasting is difficult and reinforcing the network in anticipation is very costly and could result in customers paying for infrastructure they do not need.
- 3.5 We are therefore incentivising and putting pressure on DNOs to look for smarter and more efficient ways to increase the capacity of the network. Our work on 'quicker, more efficient connections',¹ has identified ways, (e.g. flexible connections, consortia for connection customers and more effective queue management) for DNOs to get more out of the existing network capacity without the need for expensive network reinforcement. This could help accommodate new types of low carbon housing. We are also examining longer-term reform of access arrangements (see below).

¹ For more information see 'Unlocking the capacity of the electricity networks', and associated documents 14 February 2017; [link here](#)

3.6 In our joint publication with Government, we published a Smart Systems and Flexibility Plan in July 2017², which set out the action we are taking alongside industry to deliver a smarter, more flexible energy system to ensure we can get maximum use from the existing network and accommodate new types of generation, by:

- removing barriers to smart technologies, including storage;
- enabling smart homes and businesses; and
- making markets work for flexibility.

3.7 As part of this work, we are empowering consumers by ensuring households and businesses can use energy when it is cheapest, and reward them for being flexible on when they use energy. By rolling out smart meters, enabling suppliers to offer smart tariffs, and harnessing the power of data communications in home appliances and gadgets, we will make it easier for consumers to lower their bills.

4. Enabling new connections to the network

4.1 The growth in connecting new generation (much of it renewables) to the distribution network outstripped many forecasts, with concentrations in certain technologies and regions. The capacity of the network to accommodate these new connections has become increasingly scarce with bottlenecks appearing in many areas. These physical constraints can at times mean new connections cannot be accommodated without reinforcement to add new network capacity. New and changing forms of demand (such as new housing developments or growth in electric vehicles) may experience similar issues.

4.2 Some degree of network constraint may be efficient, ensuring the costs we pay for the network are reasonable and the network is not oversized. But, constraints can have negative impacts – adding cost and delays to a project for parties looking to connect and on the cost we all pay for the electricity system overall – which may be a concern if they are not efficiently managed.

4.3 New users may be unable to connect beyond the point where the network can transport more power, or where connected, may be limited in their ability to export electricity at certain times. Overcoming this can mean more investment is required – by DNOs and connecting customers – to accommodate them, or it can affect the value of the connection for the customer if they can't export when they want to.

4.4 We have incentivised and encouraged³ DNOs to develop alternative, more flexible connection arrangements. These avoid the need for new network capacity, if users agree to have their export capacity curtailed at times. This can reduce connection time and costs. Network operators are also starting to consider how efficiently existing network capacity is used and monitoring parts of their network in real-time that they did not have to in the past.

4.5 These 'non-build' solutions provide DNOs and connecting customers with the ability to respond quickly and manage uncertainty about how network requirements may evolve. By deferring investment in new capacity, the risk of creating stranded assets (that have to be paid for but are not ultimately needed) may be avoided and connection times sped up. However, it is important that flexible connections, and access arrangements more broadly, meet the needs of customers and function in a way which supports the efficient use and development of the system as a whole.

4.6 One of the DNOs in Wales, Scottish Power Energy Networks (SPEN), has led a consortium of contracted or connected wind development of almost 500MW in mid-

² <https://www.ofgem.gov.uk/publications-and-updates/upgrading-our-energy-system-smart-systems-and-flexibility-plan>

³ <https://www.ofgem.gov.uk/system/files/docs/2017/02/unlocking-the-capacity-of-the-electricity-networks-associated-document.pdf>

Wales⁴, plus two other developer-led consortia schemes totalling 90 MW to facilitate more renewable generation in Wales.

Features of the existing price control framework (RIIO⁵) that should drive network companies to manage changes in how the electricity grid is used

- 4.7 The existing package of outputs and incentives, which runs until 2023, should help distribution network operators (DNOs) to respond to changes in how energy is used while still meeting the needs of customers. For example:
- a. The **interruptions incentive scheme (IIS)**⁶ encourages companies to anticipate the increased loads from low carbon technologies (e.g. heat pumps in low carbon homes) so that they do not overload network assets and cause interruptions.
 - b. We incentivise the delivery of **health, criticality and load indices** to ensure that DNOs are not making efficiency savings at the expense of the network condition.
 - c. The **efficiency incentive**⁷ ensures that the network companies do not over-invest to avoid interruptions. It incentivises the companies to look for the most cost efficient solution, which will drive DNOs to adopt flexible solutions (e.g. demand side response (DSR)).
 - d. The package of **connections incentives**⁸ (time to connect incentive, customer satisfaction and connection engagement) encourages the DNOs to consider the needs of connection customers (e.g. parties wishing to connect new housing developments).
 - e. The **innovation stimulus**⁹ package encourages network companies to try new operational, technical, commercial and contractual arrangements in their business.
 - f. The **stakeholder engagement incentive**¹⁰ drives DNOs to identify and engage stakeholders (e.g. housing developers) and use this to inform how they run and plan their business. The incentive financially rewards companies where the company can demonstrate that the engagement leads to high quality outcomes.
 - g. **Uncertainty mechanisms**¹¹ will help to manage the uncertainty over the timing and take up of low carbon technologies. For example, if load related expenditure is 20 per cent higher or lower than set in the price control (e.g. as result of low carbon technologies), the DNOs or we can trigger a reassessment.

5 De-centralised energy supply

- 5.1 In Britain and across Europe there is growing interest in decentralised energy activities where consumers and organisations seek to take more control of their energy production and/or supply. This approach to energy has become popular with consumers who want to reduce costs, contribute to decarbonisation, or feel unsatisfied with larger suppliers. Many groups and organisations see a potential in decentralised energy arrangements to drive a decarbonisation agenda, through consumer empowerment and engagement.

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http://www.spenergynetworks.co.uk/pages/connecting_mid_wales_windfarms_to_the_national_electricity_network.asp

⁵ RIIO is Ofgem's framework for setting price controls for network companies. RIIO (Revenue = Incentives+Innovation+Outputs), a performance based model for setting the network companies' price controls which lasts eight years.

⁶ [Quality of service incentives](#)

⁷ [Guide to the RIIO-ED1 electricity distribution price control](#)

⁸ [Consultation on penalties for the distribution network operators under the Incentive on Connections Engagement](#)

⁹ [Electricity Network Innovation Competition](#)

¹⁰ RIIO-ED1 Stakeholder Engagement and Consumer Vulnerability Guidance Document can be found [here](#)

¹¹ [Strategy decision for the RIIO-ED1 electricity distribution price control](#)

- 5.2 Decentralised energy supply can include electricity generation, distribution and supply, self-consumption, aggregation, storage or energy efficiency services, generation of renewable electricity or provision of other energy services, such as local balancing services, to its shareholders or members.
- 5.3 Some local councils have entered the energy market as suppliers, or in partnership with suppliers. The Welsh Cabinet Secretary for Environment and Rural Affairs, Lesley Griffiths set out targets for Wales in her recent energy statement. These include; Wales generating 70 per cent of its electricity consumption from renewable energy by 2030, 1GW of renewable electricity capacity in Wales to be locally owned by 2030 and new renewable energy projects to have an element of local ownership by 2020. In response to targets such as these and the devolution agenda, our work on Smart Systems and Flexibility is addressing the implications of increasing numbers of renewable on the network and other local energy initiatives.
- 5.4 Local ownership models often focus primarily on providing affordable energy of a specific kind, such as renewable energy, for their members or shareholders rather than prioritising profit-making like a traditional energy company. By directly engaging with consumers, local ownership models are demonstrating their potential in facilitating the up-take of new technologies and consumption patterns, including smart distribution grids and demand response, in an integrated manner.
- 5.5 Community energy can also advance energy efficiency at household level and help fight energy poverty through reduced consumption and lower supply tariffs. It enables certain groups of household consumers to participate in the energy market who otherwise might not have been able to do so.
- 5.6 In general, we see decentralised energy supply as a good thing if it brings more choice for consumers and more competition to the market. Decentralised energy projects can drive decarbonisation and energy efficiency, and have the potential to reduce the investment needed in our networks. We therefore aim to ensure that there is a level playing field so that all technologies and business models can compete equally, without barriers to entry to the market, and that the market arrangements do not stifle innovation from bringing consumer benefits.

6 Challenges presented by decentralised energy

Costs and access to the network

- 6.1 Traditionally our energy system has been operated more centrally, with large generators transmitting down to the distribution and household level. This system is paid for by two types of network charges; those designed to be cost-reflective, and those designed to 'top up' the monopoly networks revenues to recovery all the costs of running a network. The 'fixed costs' of running this system, such as the building, operating and maintenance of the network, as well as taxes and renewable subsidies, have been shared between the broader customer base.
- 6.2 Decentralised energy undertakings come in a wide range of shapes and sizes. If decentralised energy is placed in areas of the network which are currently constrained, they can play a significant role in enabling customers to access the network and reducing costs for customers by offsetting costly reinforcement work.
- 6.3 However, in some of the schemes that are emerging, the benefits may come at the expense of the broader consumer base, for example by burdening them with an increasing share of network costs. We want to ensure that those customers who rely exclusively on the network are not unduly disadvantaged by absorbing these residual costs, compared to those who may opt to be a part of a local energy scheme (and not the wider network).
- 6.4 Customers who largely rely on their own decentralised supply may also still need access to the wider network for security of supply, even if this is only for a very small part of the day or year. The fixed costs involved in ensuring that the network

is available for 'insurance' purposes, must also be paid for by customers who use it rarely.

- 6.5 In August this year, we launched a Significant Code Review (SCR) that aims to address our concern that the current framework for residual and cost-recovery charging may result in inefficient use of the networks and unfair outcomes for consumers. We have recently published our latest thinking¹² on how we will progress with this work and discuss our collected thoughts on how we could reform the current framework for residual charges before outlining our proposed approach and justifications to our decisions.
- 6.6 We also believe that network tariffs related to decentralised customers should be cost-reflective. Network tariffs should be designed to reflect the value of the network to all those connected – costs and benefits – irrespective of the type of consumer involved. All consumers should face price signals.
- 6.7 We believe that cross-subsidisation (for example consumers who rely exclusively on the network paying taxes and levies on renewable subsidies that benefit those who opt for decentralised supply) should also be avoided.
- 6.8 We also believe that decentralised energy customers should have access to flexibility mechanisms so that they can participate in all flexibility valuation mechanisms on a level playing field. In addition, they should also have metering devices to allow them to participate in balancing markets and compete with other sources of flexibility on a level playing field.

Consumer Rights

- 6.9 In line with our principal objective to protect the interests of existing and future electricity and gas consumers we need to ensure that consumers who opt for decentralised supply are still able to benefit from an energy supply that promotes;
- value for money;
 - security of supply and sustainability, for present and future generations of consumers, domestic and industrial users;
- 6.10 We therefore need to ensure that the regulatory framework enables decentralised supply whilst ensuring that consumers who may opt into such a scheme are not locked into an alternative monopoly supplier and they are still able to respond to price signals and switch suppliers if desired.
- 6.11 Customers who are supplied from a decentralised supply should also benefit from an equivalent security of supply standard, so they are not comparatively disadvantaged to those who use the national network in terms of their supply standards. Any deviations from this should be fully transparent and understood by the customer.

7 Regulatory Reform

- 7.1 We think network charges and arrangements for connection and use of the networks need to change, and we must find smarter ways to use grid infrastructure. If this does not happen there is a risk that the changes in the way we use and generate electricity will push up network costs and generation assets will be used less efficiently. There may also be delays in being able to connect new and low carbon technologies to the system.
- 7.2 As outlined above, we are assessing these changes in the decentralised energy landscape and the models that are emerging. These wider changes in the energy system are presenting both challenges and opportunities. We consider that if these

¹² https://www.ofgem.gov.uk/publications-and-updates/targeted-charging-review-update-approach-reviewing-residual-charging-arrangements?utm_source=Charging+Futures+-+electricity+transmission+and+distribution+network+users&utm_campaign=2f885c10c9-CHARGING_FUTURES_2017_10_27&utm_medium=email&utm_term=0_f46a3d5be7-2f885c10c9-57611081&mc_cid=2f885c10c9&mc_eid=77f463bb3c

changes are harnessed to develop a more flexible and efficient system, consumers will benefit from an affordable, secure and responsive market.

7.3 These changes are also challenging the regulations and market rules that govern the energy industry. We are working to keep pace with changes to the industry. For example, we are:

- considering how future network regulation, access and wholesale markets may need to evolve to support a wider range of outcomes. This includes the Smart Systems and Flexibility Plan with Government,¹³ our recent working paper on electricity network access reform and forward-looking charges¹⁴, the future role of the System Operator (SO)¹⁵ and our framework for network regulation (RIIO).¹⁶
- addressing how some network charges are recovered from users, so that distortions are reduced and all users are treated fairly. This includes our work on the Targeted Charging Review,¹⁷ our recent Update on our approach to reviewing residual charging arrangements¹⁸, embedded benefits¹⁹ and access reform.²⁰
- facilitating the key enablers of this transition to ensure the critical infrastructure is in place. This includes our work on smart meter rollout²¹, half-hourly settlement²² and the Innovation Link.²³

¹³ Our Smart Systems and Flexibility plan, 24 July 2017, can be found [here](#)

¹⁴ Our 'Reform of electricity network access and forward-looking charges: a working paper' can be found [here](#)

¹⁵ Information on the future role of the SO can be found [here](#)

¹⁶ Information on the our RIIO-2 work can be found [here](#)

¹⁷ Targeted Charging Review – Significant Code Review Launch, 4 August 2017, can be found [here](#)

¹⁸ Targeted Charging Review: update on approach to revising residual charging arrangements can be found [here](#)

¹⁹ Decision on industry proposals (CMP264 and CMP265) to change electricity transmission charging arrangements for Embedded Generators, 20 June 2017, [link here](#).

²⁰ For more information, see our "Our strategy for regulating the future energy system", 4 August 2017; [link here](#)

²¹ More information on our work on smart metering can be found [here](#)

²² Our work on half-hourly settlement reform can be found [here](#)

²³ The [Innovation Link](#) offers support on energy regulation issues to business looking to introduce innovative propositions that may bring benefits to the energy sector.