ofgem Making a positive difference for energy consumers

Ofgem: Innovation and Regulation

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Overview:

Innovation is increasingly affecting how energy is produced, transported, managed and consumed. It's not just about technologies, but about new products, services, processes, market actors and business models that can benefit consumers.

Innovation will determine the future of the energy system. We want to make sure regulation facilitates innovations that are in consumers' interests. In this report you can find out how we approach innovation and how it shapes the way we regulate.

This report responds to questions raised by the government in its Productivity Plan (2015) about the roles of new technologies and business models in driving innovation in the energy sector, and the implications for regulatory arrangements. This report illustrates how we are adapting regulation to remove undue barriers and create a regulatory environment conducive to innovation.

CEO's Foreword

We're standing at the edge of a deep and wide-ranging transformation in the energy system. This is partly being driven by innovation, with technology remaking the energy landscape, but at the same time it also offers massive potential for more innovation. Moving from a largely centralised, carbon-intensive model to one which will be increasingly carbon-constrained, smart, flexible and decentralised is creating challenges which can only be addressed by innovation.

We believe innovation should be able to reach all parts of the energy system. It's about more than start-ups and new technologies, as important as those things are. It's about new products and services and improving processes that meet consumers' emerging needs. Innovation's roles in this transformation will likely mean that the energy system of tomorrow will be as unfamiliar to us as today's information technologies would be to the early internet pioneers. New business models are already blurring the traditional sector roles of suppliers, generators and consumers. They're challenging market structures and how the energy system operates.

During this transformation, regulation needs to be sufficiently flexible and agile to facilitate innovations in consumers' interests, while maintaining the protections required of an essential service. Our recent work with BEIS on a smarter, more flexible electricity system sets out some of the key challenges we face.

We've been working to better understand what types of innovation are coming to market, the challenges innovators are facing, and the implications for regulation. We've already started removing barriers and creating the conditions for innovation, such as through our RIIO price control framework, and the move to relying more on principles rather than prescriptive rules in the retail market. We want to continue this engagement and to understand from innovators about their issues. Part of our response is the creation of a new Innovation Link which will support innovators in navigating the regulatory jungle, and provide fast, frank feedback about the implications of innovators' plans.

With transformation accelerating, there will be an increasing need for regulation to evolve. Our horizon scanning work has been looking at what's driving change and how this should inform our future priorities. The defining challenge we see is how to regulate in an increasingly uncertain world: while no-one can be certain about what the future system will look like, we believe that we can best protect consumers' interests by adopting a flexible approach which relies on learning over time.

Moving towards a regulatory framework based more on principles and outcomes, seems likely to be more robust to future developments. It will better enable us to mitigate the risks and maximise the consumer benefits afforded by innovation.

Dermot Nolan
Chief Executive

Associated documents

Non-traditional business models – February 2015
https://www.ofgem.gov.uk/sites/default/files/docs/2015/02/non-traditional_business_models_discussion_paper_0.pdf

HMT Productivity Plan: fixing the foundations – July 2015
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443898/Productivity_Plan_web.pdf

Forward Work Programme 2016-17 – March 2016
https://www.ofgem.gov.uk/publications-and-updates/forward-work-programme-2016-17

RIIO Price Control Factsheet – March 2013
https://www.ofgem.gov.uk/ofgem-publications/64003/pricecontrolexplainedmarch13web.pdf

The Network Innovation Review – our consultation proposals – December 2016
https://www.ofgem.gov.uk/system/files/docs/2016/12/innovation_review_consultation_final.pdf

Independent evaluation of the Low Carbon Network Fund – Poyry, October 2016
https://www.ofgem.gov.uk/system/files/docs/2016/11/evaluation_of_the_lcnf_0.pdf

Elective half-hourly settlement: conclusions paper – May 2016
https://www.ofgem.gov.uk/system/files/docs/2016/05/elective_hhs_conclusions_paper.pdf

Mandatory half-hourly settlement: intention to launch an SCR – June 2016
https://www.ofgem.gov.uk/system/files/docs/2016/06/mandatory_half-hourly_settlement_hhs_intention_to_launch_an_scr_final_version.pdf

Smart, Flexible Energy System – a call for evidence with BEIS – November 2016
https://www.ofgem.gov.uk/publications-and-updates/smart-flexible-energy-system-call-evidenceh

The future of retail market regulation – December 2015
https://www.ofgem.gov.uk/sites/default/files/docs/the_future_of_retail_market_regulation.pdf

The future of retail market regulation: an update on the way forward – June 2016
https://www.ofgem.gov.uk/publications-and-updates/future-retail-market-regulation-update-way-forward

Ofgem's Future Insights Programme – October 2016
https://www.ofgem.gov.uk/publications-and-updates/ofgem-launches-future-insights-programme

Ofgem's Future Insights Series: the Decarbonisation of Heat – October 2016
https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-future-insights-series-decarbonisation-heat

Contents

Executive Summary

Our priority is to protect the interest of existing and future energy consumers. We want to facilitate innovations that are in consumers' interests This report sets out how we view innovation and its relationship to regulation. It responds to the following Productivity Plan[1] questions:

Question 1: How is new technology likely to shape the regulated sectors?

The energy system is transforming from one that is largely centralised and carbon-intensive to one that is carbon-constrained, more decentralised, smart and flexible. Innovations in the technologies and processes by which energy is produced, transported, distributed and consumed are central to this transformation. We want to ensure the regulatory framework facilitates innovations in consumers' interests.

Question 2: How could legislation and enforcement frameworks adapt to new technologies and disruptive business models to encourage growth?

Innovation is a business as usual consideration for us. We have a range of projects underway looking at the future regulation of markets and networks. For example, we're considering how to enable innovation in the interests of consumers in the areas of retail regulation, system flexibility, and network investment and management.

Question 3: How could regulators better use new technologies to generate efficiency savings and reduce burdens on business?

We use technology to generate efficiencies across all of our regulatory activities, including our role as the administrator of government's social and environmental schemes. We believe that new technologies can deliver faster and more reliable switching arrangements for consumers, and strive to use these technologies to deliver more efficient and effective services to our stakeholders.

Looking forward

As well as the activities already underway and described in this document, we'll continue to consider innovation and regulatory matters through our ongoing stakeholder engagement. Ongoing engagement will ensure we're better aware of the potential benefits, issues and barriers facing innovation. We'll do this through our standard engagement processes as well as through our new Innovation Link. The Link will help innovators to better understand regulatory issues and for us to better understand their experiences and implications for regulation.

[1] See here for 2015 'Productivity Plan: Fixing the Foundations': https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443898/Productivity_Plan_web.pdf

1. Introduction

Chapter Summary

This chapter explains how this report responds to the government's 2015 Productivity Plan requirement that regulators publish a plan setting out how legislation and enforcement frameworks could adapt to emerging technologies and disruptive business models.

1.1. This report explains what we already do and what more we'll do to promote and facilitate innovation to deliver better consumer outcomes.

1.2. It describes how we work to ensure the potential of innovation is realised while protecting consumers' interests. We believe innovation has a pivotal role to play in delivering positive outcomes for consumers. Our Strategy, published in December 2014, describes how we regulate to deliver five key consumer outcomes.[2] Realising the potential of innovation is key for each outcome:

- Lower bills than would otherwise have been the case.
- Reduced environmental damage both now and in the future.
- Improved reliability and safety.
- Better quality of service appropriate for an essential service.
- Benefits for society as a whole including those struggling to pay their bills.

1.3. As the GB energy regulator, our principal objective is to protect the interests of existing and future consumers. This includes, among other things, protecting consumers' interests in the reduction of greenhouse gases, ensuring security of supply and protecting the public from dangers. We are committed to ensuring the regulatory system is agile and flexible, and that it facilitates innovations that are in consumers' interests.

[2] See Ofgem Strategy: https://www.ofgem.gov.uk/publications-and-updates/corporate-strategy

What is innovation?

1.4. The government's Innovation Report 2014 defines innovation as "the application of knowledge to the production of goods and services. It means improved product and service quality and enhanced process effectiveness."[3]

1.5. Innovation is a constant feature of the regulated energy system. It's not just about technologies, but about new products, services, processes, market actors and business models that can benefit consumers. Some examples of innovation within the energy system and markets are explored in chapter 2.

Government's questions on innovation

1.6. The Productivity Plan requires that departments work with regulators to publish 'Innovation Plans' that set out how legislation and enforcement frameworks could adapt to emerging technologies and disruptive business models.[4] In preparing our documents, regulators were asked to consider the following questions:

- How new technology is likely to shape the regulated sectors?
- How could legislation and enforcement frameworks could adapt to new technologies and disruptive business models to encourage growth.
- How could regulators could better use new technologies to generate efficiency savings and reduce burdens on business.

1.7. Chapter 2 of this report responds to the first of these issues by showing how we think technological innovation is already and will likely continue to shape the energy sector.

1.8. Chapter 3 responds to the second. It gives examples of how regulatory arrangements are responding to technological / business model innovations in the competitive and regulated markets. The examples illustrate the intricate relationship between innovation and regulation.

1.9. Chapter 4 explains how we use technology to generate efficiencies and reduce the regulatory burden on businesses. This section covers all of our activities, including our role as the administrator of a number of the government's renewable energy schemes and social and environmental programmes.

[3] See Innovation Plan 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293635/bis-14-p188-innovation-report-2014-revised.pdf

[4] See HMT's Productivity Plan 2015: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443898/Productivity_Plan_web.pdf

1.10. Chapter 5 explains what we're going to do next. As well as identifying new innovation trends and events, this will involve monitoring and responding to market developments.

1.11. Chapter 5 also introduces our new Innovation Link. Modelled in part on the Financial Conduct Authority (FCA) innovation hub[5], it will provide a visible, single point of access for innovators. It will allow innovators to engage with us and seek informal, fast and frank feedback on the regulatory implications of their plans. The Link's job will be to help innovators navigate regulatory arrangements and will allow us to better understand innovators' needs, their consumer potential and the regulatory challenges they face.

[5] The FCA's innovation hub model: https://www.the-fca.org.uk/firms/project-innovate-innovation-hub

2. Innovation in the energy system

Chapter Summary

This chapter responds to the government's question about how new technology is likely to shape the regulated sectors. It also provides examples of how innovation is manifesting and driving change in the energy system and markets.

System-wide transformation

2.1. The energy system is changing. We're seeing the technologies and processes by which energy is produced, distributed and consumed evolving. The largely centralised, carbon-intensive model is moving to one which will be increasingly carbon-constrained, smart, decentralised and flexible. The traditional energy sector roles of suppliers, generators, transmitters, distributors and consumers are also evolving and we're seeing new actors emerging such as 'prosumers', aggregators, platforms and other third party intermediaries. Technology is rapidly remaking the energy landscape.

2.2. The energy system transformation is being driven and enabled by new technologies that affect all aspects of the energy supply and value chains. These technologies produce energy in different ways and let gas and electricity be transported and used more intelligently, sustainably and efficiently. They allow for energy to be stored in times of plenty and used in times of need. They also allow for gas and electricity systems to interact more efficiently and provide integrated solutions.

2.3. There are also innovations driven by policy imperatives such as responding to climate change, including renewables targets. Examples include government subsidies for low-carbon technologies, such as the Renewable Heat Incentive[6] and the Feed-in Tariff.[7] These subsidy schemes have let more people take up renewables and energy efficiency measures in recent years, and contributed to the broader changes we are seeing. As the pace and scope of the low-carbon transition expands, so will the range and scale of opportunities for innovators. These changes will ultimately reshape the face of the regulated sector.

[6] See information about Renewable Heat Incentive here: https://www.ofgem.gov.uk/environmental-programmes/domestic-renewable-heat-incentive-domestic-rhi/about-domestic-rhi

[7] See information about Feed-in Tariff scheme here: https://www.ofgem.gov.uk/environmental-programmes/feed-tariff-fit-scheme

The supply-side

2.4. On the electricity production side, we have already seen a shift in generation. Although predominately driven by large-scale technologies, such as on and offshore wind and biomass-fuelled thermal generation, we are also seeing greater deployment of microgeneration technologies, such as solar photovoltaics.

2.5. Between 2011 and 2016, the proportion of total electricity from renewables rose from 9.4% to 24.9%, and is continuing to increase.[8] Because of the growth in renewables, both the transmission and distribution networks are changing to respond to increasingly intermittent and variable energy flows.[9]

2.6. The growth in small-scale renewables is challenging the traditional one-way flow of electricity from large generators to end-users, requiring the network to develop bi-directional capabilities. New storage technologies, active network management and demand-side response are emerging and being integrated into network operations. These will play increasingly important roles in a low-carbon energy system.

2.7. In gas supply, we're seeing new sources of gas, including bio-methane, bio-synthetic natural gas and shale, alongside exploration of the role of hydrogen in heating our homes and businesses. Power-to-gas technologies in other countries are already blurring the lines between gas and electricity. We're also seeing more bi-directional flows in GB as new gas sources connect at the distribution level. Natural gas currently provides over 70% of our heat demand across the domestic, industrial and service sectors[10]; this represents a significant challenge to the sector's low-carbon transformation and a major challenge for innovation.[11]

The demand-side

2.8. On the demand-side, the low-carbon transformation is manifesting itself in different ways. More heat pumps are being installed, as are district heat networks. Transport is changing as electric, hydrogen and compressed natural gas cars and buses appear on our roads. New technologies are helping consumers redefine their relationship with energy: in recent years we've seen over 850,000 new generators come on-stream, producing and consuming

[8] See Ofgem Sustainable Development Indicators here: https://www.ofgem.gov.uk/about-us/how-we-work/promoting-sustainability/sustainability-reporting

[9] This is being explored in Ofgem's joint work with the Department for Business, Energy and Industrial Strategy (BEIS) on a smart, flexible energy system, which is described further in chapter 3.

[10] See "Energy Consumption in the UK 2013", BEIS, 2015.

[11] See Ofgem's "The Decarbonisation of Heat" Future Insights paper: https://www.ofgem.gov.uk/system/files/docs/2016/11/ofgem_future_insights_programme_-_the_decarbonisation_of_heat.pdf

their own power, enabled by Feed-in Tariffs. In 2015, consumption of self-produced electricity by the domestic sector increased from 2014 by 26%, to stand at 1,180 GWh, more than fifty times the 23 GWh consumed in 2010. However, self-produced electricity still remains at just 1% of domestic consumption.[12]

2.9. Smart meters will change the face of the retail market, allowing suppliers to provide new products, services and pricing options for consumers. The past few years have seen new suppliers proliferate, with independent suppliers now holding around 15% and 14% respectively of the domestic gas and electricity markets.[13] New technologies are also allowing third party intermediaries to find new niches. In the future, they will likely allow consumers to provide flexibility services to the system, respond to price signals, change their behaviour and reap the rewards.

2.10. The changing supply mix and consumption patterns demand more flexibility in the energy system. It's becoming more important that the patterns of demand are able to make the most of variable generation.[14] Storage and demand-side response will provide vital forms of flexibility. Smart meters and the transition to more active Distribution System Operator arrangements and greater coordination with the System Operator would seem likely to enable this.

2.11. Innovations that cost-effectively and permanently reduce demand are also in consumers' interests. Lower demand reduces the need for investment in new / enhanced assets and infrastructure, and will better insulate consumers from the effects of future changes in energy prices.

Looking ahead

2.12. New technologies are leading to new value propositions and business models which are interacting with markets in new ways. We're seeing parties developing more localised approaches, seeking to improve the energy outcomes for local consumers and, in some cases, achieve additional social, economic or environmental benefits for a local area.

2.13. We are also seeing lifestyle energy service companies responding to opportunities presented by new data, such as smart thermostats. Technology transfer from other sectors, such as peer-to-peer platforms, are looking for opportunities in the GB energy market. Some of these initiatives could be disruptive and potentially set the energy system on a new path. The use of blockchain technologies developed in the financial sector could rewrite how transactions in the energy system are processed.

[12] See "Digest of United Kingdom Energy Statistics 2016", BEIS.

[13] See Retail Market Indicators: https://www.ofgem.gov.uk/data-portal/retail-market-indicators

[14] For example, renewable electricity generation is less flexible than generation by traditional fossil fuels.

2.14. As the regulator, we're already responding to the implications of many of these innovations. We've been engaging with stakeholders to better understand their ambitions, challenges and their potential to transform the system in the interests of consumers. We are continually building our evidence base on the changes that are happening and the new types of initiatives seeking to enter the market.

2.15. An example of how these engagements have led to innovations relates to our provision of derogations[15] from retail market rules. Through this process, we have relieved suppliers from certain obligations to comply with particular licence conditions to allow for innovative products and services to be introduced. The decisions and details of derogations we have granted are on our website.[16] We have published guidance for how parties should engage with us, and we hope this will spark further discussions about innovation.

2.16. We will continue to engage with stakeholders to better understand how innovative business models may affect the energy system. We're particularly interested to understand any challenges that regulation presents for innovative models that aim to deliver positive outcomes for consumers.

2.17. In this report we describe what aspects of our work are contributing to innovation. We acknowledge that the future is never certain, and the speed of transformation in the energy sector is accelerating. To ensure that we keep abreast, we have established workstreams looking at drivers for change and have established an Innovation Link to develop stronger relationships with innovators. Chapter 5 has more information about this.

[15] A derogation relieves a licensee of their obligations to comply with certain licence conditions in specific circumstances and to a specified extent. 17 derogations as of February 2016.

[16] See RMR derogations decisions and guidance here: https://www.ofgem.gov.uk/publications-and-updates/guidance-derogation-requests-domestic-retail-market-review-rmr-licence-conditions

3. Energy regulation and innovation

Chapter Summary

This chapter responds to the second question about how legislation and enforcement frameworks could adapt to new technology and disruptive business models to encourage growth. It sets out our stance on innovation, and has examples of projects that either already have or will enable innovation in the market.

Our stance on innovation

3.1. Our priority is to protect and make a positive difference for all energy consumers. We believe that well-functioning competitive markets put pressure on companies to find new, better ways of doing things. This is beneficial for consumers, although we recognise that the benefits of markets can be spread unevenly between them. As energy is an essential service, we need to make sure that all consumers receive a fair deal, including those that are in vulnerable situations or less engaged.

3.2. We believe that innovation has many benefits for existing and future consumers, but recognise it can also involve risk as well as reward. Innovation spans technologies, systems and business models but may face regulatory or other barriers. We seek to ensure that new businesses and technologies face a level regulatory playing-field. We do this by using competition as a way to encourage industry to experiment and innovate where it offers benefits to consumers and by reducing or eliminating any barriers to entry.

3.3. Some areas of the energy system are natural monopolies, where it is harder to use competitive market forces to help deliver positive outcomes for consumers.[17] In these situations, our principal regulatory tool is our power to set the price controls for the companies that operate the gas and electricity networks. Price controls are a method of setting the amount of money (allowed revenue) that can be earned by the network companies over the length of a price control. Within this framework, we aim to ensure that companies have sufficient incentives to innovate. In some circumstances we will support companies who want to innovate and achieve wider societal benefits by providing innovation funding.

[17] We have, however introduced competitive tendering to build, operate and own offshore electricity transmission assets competitively. We have also introduced competition with distribution level connections and are looking at introducing competition in onshore transmission networks. See the "competition in networks" section of this chapter.

3.4. Innovation is crucial to achieving improvements in our five consumer outcomes[18] and for moving to a flexible, secure and low-carbon energy system. This section explains how we encourage a culture of innovation in our work regulating competitive and monopoly markets.

Competitive markets and innovation

3.5. Competition can drive efficient market outcomes and benefits consumers. This means that a main part of our role is creating and overseeing regulatory frameworks that support and promote competitive markets. Competition helps to ensure consumers benefit from standards consistent with an essential service. Forcing firms to compete strongly for customers in both price and quality helps them to improve standards and innovation. That's why our general stance is to use competition wherever it can bring advantages.

3.6. As there is only one electricity system and one gas system in GB, is an important role for regulation to ensure that energy is delivered to consumers in a reliable, affordable and safe way.[19] Even in effective markets, regulatory interventions can help ensure there are good standards of service and conduct, to help steer markets in response to changing priorities and to ensure competition flourishes.

3.7. The examples set out below show how we seek to develop regulatory arrangements which support innovation and competition. Some developments have recently entered the market, others are in their early stages, and others will start influencing competitive markets in the nearer future.

3.8. We continue to talk to stakeholders on these and other areas to understand different perspectives on potential barriers to innovation and how the regulatory regime can evolve.

3.9. As part of this, we are acting on the recommendations from the investigation of the energy market by the Competition and Markets Authority (CMA).[20] This investigation was opened after we referred parts of the energy market to the CMA in 2014. One area relevant to innovation that the CMA considered was the code governance arrangements in the market. See chapter 5 for more information on this.

[18] Our Strategy (published in December 2014), sets-out how we regulate to deliver five key outcomes for consumers: lower bills than would otherwise have been the case; reduced environmental damage both now and in the future; improved reliability and safety; better quality of service appropriate for an essential service; and, benefits for society as a whole including those struggling to pay their bills: https://www.ofgem.gov.uk/publications-and-updates/ofgem-our-strategy

[19] We note that there are areas in GB where there are there independent / separate networks.

[20] See CMA investigation here: https://www.gov.uk/cma-cases/energy-market-investigation

Future retail regulation

3.10. The way electricity and gas is supplied to Britain's homes and businesses is changing. To enable this change to benefit consumers, we need to rely less on one-size-fits-all prescriptive rules and more on principles in the way we regulate. Doing so will promote innovation and competition in the retail market, while allowing us to continue providing effective consumer protections. Prescription will still be required where there is genuinely only one acceptable way of doing something or where consistency across the market is required. However, outside of these areas, we do not consider prescriptive rules to be a sustainable way of responding to risks and opportunities in the market. Principles will instead put responsibility firmly on suppliers to think carefully about how to deliver good consumer outcomes in different ways.

3.11. In December 2015, we consulted on how principles might operate in the domestic retail market[21], and in June 2016 we updated stakeholders on our approach[22]. We have started the process of removing unnecessary prescription, and around 30 pages of rules that constrain tariff innovation were removed from the supply licences in November. Our review of the next set of rules for reform will occur throughout 2017/18.

3.12. Relying more on principles will allow suppliers to be more flexible in how they meet the needs of customers, including those in vulnerable situations. Less prescriptive rules in the supply licences, which are currently around 470 pages long, will also make it easier for new entrants to understand their obligations. Unlike prescriptive rules, principles do not need modifying to respond to new problems.

3.13. Stakeholders have told us that our enforcement approach should assist our objective of supporting innovation. In particular, we should make it clear that we are open to different ways of achieving positive consumer outcomes. We are considering how our approach to enforcing principles can give suppliers space to innovate while ensuring consumers continue to be well protected.

3.14. Stakeholders have also emphasised the importance of regulatory guidance being concise, straightforward and located in a single, well-signposted place. We are considering how online information could be more user-friendly and searchable. It should be easy for everyone to find and understand supply licence obligations. Reviewing the substance of the supply licence is a good opportunity to make information as accessible as possible. Reducing research costs could go a small, but meaningful way, to keeping regulatory costs (and barriers to entry) down.

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[21] The Future of Retail Market Regulation consultation can be accessed here: https://www.ofgem.gov.uk/publications-and-updates/future-retail-market-regulation

[22] The Update on the Way Forward can be accessed here: https://www.ofgem.gov.uk/publications-and-updates/future-retail-market-regulation-update-way-forward

Flexibility

3.15. As discussed previously, the energy sector is going through a fundamental transition. Generation is becoming more distributed and variable, and consumers are benefitting from new ways to monitor and manage their energy use. To make the most of the opportunities offered by these changes, and to deliver against the UK's carbon commitments, while providing reliable and secure supply at minimum cost, we need to consume and produce electricity in a more flexible way than we do now.

3.16. Flexibility will be an increasingly key feature of energy markets. It is the ability to modify generation and / or consumption patterns in reaction to an external signal (such as a change in price, or a message). New sources of flexibility both on the supply and the demand side could help maintain a resilient, sustainable and affordable electricity system as the generation mix shifts to include a greater share of variable generation. The emergence of these new sources of flexibility is likely to be accompanied by new business models and new services for consumers.

3.17. In our September 2015 Position Paper on Flexibility in the energy system[23], we announced we would be initiating work, focused on priority areas, to make sure that regulation supports an efficient, flexible energy system, that delivers benefits for consumers. The following priority areas form part of a broader programme of work with the Department for Business, Energy and Industrial Strategy to manage the transition to a smarter energy system:

- Exploring how to support more large industrial and commercial consumers to participate in providing flexibility.
- Encouraging the transition from Distribution Network Operator (DNO) to Distribution System Operator (DSO) roles.
- Clarifying the role of aggregators.
- Clarifying the legal and commercial status of electricity storage.
- Considering how current GB distribution charging arrangements may need to change in response to the existing (and future potential) of distributed connected flexibility.

3.18. We published our joint "Smart, Flexible Energy System – a call for evidence" with BEIS on 11 November 2016.[24] The responses to the call for evidence will help shape the plan that we and BEIS intend to publish in Spring 2017. This

[23] See the position paper here: https://www.ofgem.gov.uk/publications-and-updates/position-paper-making-electricity-system-more-flexible-and-delivering-benefits-consumers

[24] See joint call for evidence here: https://www.ofgem.gov.uk/publications-and-updates/smart-flexible-energy-system-call-evidence

will set out the specific actions we will undertake to remove barriers, sharpen price signals and shape the roles and responsibilities necessary for the shift to a smarter, more flexible energy system which can meet the needs of consumers now and in the future.

Half-hourly settlement

3.19. The nature of electricity is such that generators may produce more or less energy than they have sold and customers may consume more or less energy than their supplier has purchased on their behalf. These discrepancies are reconciled through a process known as 'settlement'.

3.20. Although generators and suppliers buy and sell electricity in half-hourly periods, most consumers are settled using estimates of use based on average consumer profiles. This is because most sites do not have meters that can record consumption in each half-hour period. Smart meters are a chance to make the settlement process more accurate and timely, and to enable innovative business models. Energy suppliers are required to take all reasonable steps to install smart meters in every home and small business premises by 2020.[25]

3.21. Moving to half-hourly settlement (HHS) will have major implications and is likely to lead to innovations. Although we do not want to be prescriptive about how market participants can use HHS, it is generally accepted that HHS will help create the right environment for more demand-side response. It will let suppliers help customers move their demand to periods when electricity is cheaper, through offering innovative products.

3.22. It will support the implementation of smart tariffs (such as dynamic time of use tariffs), where the price reflects times when electricity is more or less expensive to generate or transport. Some new business models may also seek to make use of these price signals alongside new technologies (such as electric vehicles, heat pumps, storage, or micro-Combined Heat and Power).

3.23. By supporting innovation, HHS will help promote competition between suppliers and help unforeseeable disruptive innovations (concepts, business models and consumer propositions) to enter the market.

3.24. We have agreed with government to take forward a project to reform the electricity settlement arrangements in Great Britain. Our first step is to enable cost-effective HHS on an elective basis, but we expect we will need to mandate all suppliers to settle their customers on a half-hourly basis to realise the full benefits.

[25] See smart meter guidance here: https://www.gov.uk/guidance/smart-meters-how-they-work#supplier-led-roll-out

3.25. We published a conclusions paper on elective HHS in May 2016.[26] Since then, code administrators, suppliers and other industry parties have been working together to raise and progress the necessary changes and code modifications to enable cost-effective elective HHS by early 2017. The precise implementation timings will depend on practical considerations such as the Balancing and Settlement Code (BSC) release schedule.

3.26. In June 2016 we announced our intention to launch a Significant Code Review for mandatory HHS, once the work involved has been thoroughly planned and scoped.[27] We published a consultation in November 2016 on our project plan as recommended by the CMA.[28] This consultation remains open until 6 January 2017.

Non-traditional business models and local energy

3.27. Non-traditional business models (NTBMs) offer new products or services different to those typically provided in the market. They have diverse motivations and ownership arrangements, and operate at various scales. In September 2015, we published a summary of responses[29] to our consultation looking at what was driving the emergence of NTBMs, their potential for consumer benefit and the implications for regulation.

3.28. The consultation revealed that local energy is a key emerging energy system trend with many NTBMs focusing on developing technologies, products, services and business models targeted at local areas. The emergence of municipal energy models[30] coupled with GB devolution policy (Scotland, Wales and English local government) suggests the trend towards more localisation in the energy system is likely to continue.

3.29. Local energy echoes many of the drivers and challenges facing the national energy system. But different places have diverse system features, assets, geographies, consumer and other unique characteristics. We have engaged with a range of schemes[31] which reveal diverse approaches including local

[26] See HHS conclusions paper here: https://www.ofgem.gov.uk/system/files/docs/2016/05/elective_hhs_conclusions_paper.pdf

[27] See HHS open letter here: https://www.ofgem.gov.uk/system/files/docs/2016/06/mandatory_half-hourly_settlement_hhs_intention_to_launch_an_scr_final_version.pdf

[28] See HHS planning consultation here: https://www.ofgem.gov.uk/system/files/docs/2016/11/mandatory_hhs_planning_consultation.pdf

[29] See NTBM discussion paper here: https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/non-traditional_business_models._summary_of_responses_to_discussion_paper.pdf

[30] This includes Nottingham and Bristol cities establishing licensed energy supply companies, the Greater London Authority's developing Licence Lite supply arrangement, a number of local authorities operating in white label partnerships (including Peterborough, Cheshire East and Southend-on-Sea) and the Our Power licensed supplier (partnership of Scottish local authorities and social landlords).

[31] These include trials across GB utilising funding from, for example, industry, NIA / NIC, the Scottish Government's Local Energy Challenge Fund, Innovate UK, EU institutions, etc. Although not exhaustive,

supply, community generation and self-supply, micro and off-grid networks, district heating schemes, peer-to-peer arrangements and, projects seeking to enable consumers to provide local system flexibility services.

3.30. It's not clear what the scale of the local energy opportunity is, what the implications are for all consumers (not just those participating in local activities) and for market and system integrity. What is clearer, is that local energy is not any-one thing and projects' diverse aspirations and arrangements mean they interact with the energy system and regulation in different ways. We're considering the consumer and regulatory implications of local energy through our Future Insights programme and plan to publish a paper soon (see chapter 5 for more information).

Networks and innovation

3.31. Innovation is critical to achieving improvements in the five consumer outcomes and can be both encouraged by and enhance competition. In the monopoly networks we seek to emulate the incentives for innovation provided by competitive forces by ensuring that the regulated companies (and consumers) can benefit if they reduce the cost of producing their outputs or improve consumer outcomes by innovating.

RIIO

3.32. The network companies are responsible for investing in and managing the energy infrastructure. Their performance is governed by the RIIO (Revenue = Incentives + Innovation + Outputs) price control framework.[32]

3.33. RIIO covers electricity and gas transmission and distribution networks, and attempts to instil a culture of continuous innovation by incentivising the network companies to research, develop and mobilise innovations in consumers' interests.

3.34. We developed RIIO after a two-year review looking at how best to regulate network companies for a sustainable, low-carbon energy sector at a better value for money than would have been the case previously.

there are the Fintry, Heat Smart Orkney and ACCESS trials in Scotland, Energy Local's work in Oxfordshire and Bethesda Wales, the Wadebridge Sunshine Tariff and Project SYNC in South West England.

[32] A factsheet explaining price control arrangements is available here: https://www.ofgem.gov.uk/sites/default/files/docs/2013/03/price_control_explained_march13_web.pdf

3.35. Innovation is key to network companies delivering the objectives of RIIO. Many elements of the RIIO price control framework are designed to incentivise innovation, in particular:

- The price control period is eight years, rather than the five year term of previous price controls. This is to encourage companies to take a longer-term view.
- The efficiency incentive means that companies and consumers share in any cost savings they can achieve. This encourages them to innovate in the way they deliver their outputs.
- RIIO focuses on "totex" which means that companies are equally rewarded for spend on capital investment or operational costs which should get them to look for alternative solutions, such as demand-side response, rather than just traditional investment.

3.36. The innovation encouraged through RIIO can take many forms, including deploying new technologies, new operational processes, and commercial arrangements.

3.37. For example, the lengthening of the price control period encouraged Gas Distribution Networks (GDNs) to rethink their contractor strategies. Some GDNs consider that using smaller contractors lets them better align their activities regionally, rather than centrally. This maximises local knowledge, improves local ownership, and improves communications and workload. Some GDNs have also included incentives for the new contractor models in line with RIIO outputs.

Network innovation schemes

3.38. Recognising the wider societal benefits that can flow from innovation, in RIIO we introduced a time-limited package of specific innovation schemes consisting of: an annual Network Innovation Competition (NIC); for smaller projects, a Network Innovation Allowance (NIA); and, the Innovation Roll-out Mechanism (IRM) to fund the deployment of successful trials. Before this, we operated the Low-carbon Network Fund (LCNF) for electricity distribution network companies.

3.39. RIIO's innovation schemes are intended to change the network companies' cultures. We want them to have the ethos, internal structures and third-party relationships to innovate as part of their everyday business.

3.40. As part of the NIC and NIA, we expect the network companies to collaborate with each other and other parties. To help do this, we required the network

companies to develop a Collaboration Portal,[33] which directs potential collaborators to network innovation resources, documents, and contacts within the network companies for potential partners to submit project ideas.[34]

3.41. The NICs are annual competitions for network licensees to submit innovative bids for up to £99m of funding covering both gas (£18m) and electricity (£81m)[35]. The projects must meet seven evaluation criteria, including accelerating the move to a low-carbon energy system and / or delivering environmental benefits, while having the potential to bring net financial benefits to future and / or existing customers. There is a strong emphasis on sharing knowledge so that customers on all networks can benefit.

3.42. The projects funded so far through the NICs are diverse: from using household and industrial waste to produce pipeline quality gas for use in peoples' homes, to a new technique to reduce electricity losses at transformer substations.[36] A number of the projects are also considering and improving understanding about different approaches to responding to the challenges of a flexible energy system. Projects have seen network companies form partnerships with each other, as well as third parties such as small and medium-sized enterprises, universities and local councils.

Low-carbon networks fund

3.43. In the price control covering electricity distribution from 2010 to 2015 (DPCR5), we introduced the LCNF to encourage the DNOs to trial innovative technological, operating and commercial arrangements to help with the transition to a low-carbon economy. Around £270m has been spent by the DNOs under this scheme.

3.44. People recognise that the LCNF has improved the DNOs' approach to innovation, knowledge sharing and collaborative working with third parties. We now expect to see the results of learning from LCNF projects being rolled out as business as usual.

3.45. In April, we published an independent summary of the learning derived from LCNF projects.[37] In December, we published an independent review of the LCNF by Poyry[38] which found estimated financial benefits, by 2030, of:

[33] See NIC Governance Documents here: https://www.ofgem.gov.uk/publications-and-updates/version-two-network-innovation-competition-nic-governance-documents

[34] See Network Innovation Collaboration Portal here: http://www.ena-eng.org/network-innovation/

[35] We are consulting on reducing the amount available under the electricity NIC from the 2017 competition. See the section 'RIIO's Innovation Review' below for further information.

[36] 2016 NIC successful projects brochure; 2015 NIC successful projects brochure; 2014 NIC successful projects brochure; and 2013 LCNF and NIC successful projects brochure.

[37] Report commissioned by Ofgem and undertaken by EA Technology:

- £800m to £1200m if the projects are rolled-out by those companies that undertook them though the LCNF; and,
- £7bn to £11bn if projects are rolled-out across the GB networks.

RIIO innovation review

3.46. We are currently consulting on changes to the governance arrangements of the NIC and the NIA as part of our Innovation Review.[39] The aim of this process is to ensure that our innovation schemes deliver value for money for customers and drive cultural change within the network companies. Our proposals were informed by Poyry's independent review and include: reducing the future level of funding available for the electricity NIC; facilitating increased third party participation in the NIC; and, the development of an industry innovation strategy.

3.47. We will publish our decision next year, subject to consultation, and will seek to implement some of our proposals in the Spring in time for the 2017 NIC.

Quicker, more efficient connections

3.48. The generation landscape over the last decade has changed beyond recognition, with over 850,000 generators connected to the grid and this trend is continuing. In some areas of GB, network congestion and constraints have arisen. Some stakeholders feel that getting connected to the electricity distribution network can take too long. Last year, we consulted on how to improve the connections process, [40] and we have challenged the network operators to find innovative ways of squeezing more capacity out of their grids to connect renewables.

3.49. We are publishing an update in the near future which will outline the progress network operators have made. The kind of activities DNOs have been innovating with include offering more flexible connection terms, managing the queue of connection customers to ensure that stalled projects are not unnecessarily reserving capacity, managing and coordinating consortia of connection customers, and identifying unused network capacity that could be

https://www.ofgem.gov.uk/publications-and-updates/ea-technology-s-summary-low-carbon-network-fund-learning

[38] See the Poyry LCNF evaluation here: https://www.ofgem.gov.uk/system/files/docs/2016/11/evaluation_of_the_lcnf_0.pdf.

[39] See the Innovation Review consultation here: https://www.ofgem.gov.uk/system/files/docs/2016/12/innovation_review_consultation_final.pdf

[40] See more information on the quicker and more efficient connections consultation here: https://www.ofgem.gov.uk/publications-and-updates/quicker-and-more-efficient-distribution-connections

used for other customers. Some good progress has been made in these areas and we want to ensure that the DNOs continue to make improvements to the connections service.

3.50. We also outlined three different models which could enable investment in upgrading the network to be made in anticipation, rather than in response to, a connection. We invited stakeholders to bring forward schemes that could serve as case studies. These would help establish models that can be employed across the industry.

3.51. Six trials were brought forward, reflecting the issues experienced by large urban regeneration developments and distributed generation schemes wishing to connect. These trials are making progress, with one DNO successfully establishing a consortium of hydro providers in Scotland and another seeking a solution to allow a Development Corporation to reinforce a network area prior to development in a regeneration zone.

3.52. Some stakeholders have suggested innovative arrangements that are not permitted (either by the distribution licence or the Electricity Act 1989). Although we can't allow DNOs to act outside what is currently permitted, the costs and benefits which may flow from a more innovative approach could justify amending the 'rules' that govern connections, or providing licensees with a derogation from complying with certain obligations. We are therefore pursuing one DNO's request to derogate from their charging methodology and another trial is investigating the potential for amending primary legislation to facilitate their proposed model.

Competition in networks

Distribution level connections

3.53. The distribution network delivers electricity to customers' premises. Connections are made either when new customers want to take electricity off the network (such as a housing developer or supermarket) or put electricity onto it, like a generator does. Not all new connections to the distribution network are made by DNOs. Competition in this market exists, and a customer can choose an alternative provider for some types of connections works.

3.54. We believe that effective competition in these markets will help improve the quality of service that customers receive and make the cost of connection lower than it otherwise would have been. Competitions in connections can also encourage innovation in the type of services available, for instance by offering customers multi-utility connections packages (a combination of gas, electricity, water and telecoms).

3.55. We are keen to see this market operate effectively and in 2015, we introduced a new licence condition[41] and enforceable code of practice (CoP).[42] The CoP governs how DNOs provide essential services to the market. During 2016, Ofgem approved three modifications to the CoP. One of the modifications introduced clear, common reporting requirements to demonstrate DNO compliance with the CoP. The other two reduced the number of essential services that are only available from the DNOs, and helped to harmonise the provision of these essential services across all DNO areas. These modifications should make it easier for competitors to enter the market and lead to more innovative services being offered to customers.

Transmission assets

3.56. In recognising the critical role of competition in stimulating innovation, the Offshore Transmission Owner (OFTO) regime is open and competitive, built on encouraging innovation, and bringing in new sources of technical expertise and finance.

3.57. Under the regime, bidders compete for the opportunity to own and operate offshore transmission systems. By competing on price and service quality, bidders have to innovate in order to be successful. For example, they may need to employ new ways of providing finance or insurance. Alternatively, they might seek to adopt new underwater surveying techniques that could enhance operational efficiency, minimise cable downtime and reduce operational costs.

3.58. The first three rounds of competitive tendering so far have involved the ownership of transmission infrastructure assets worth £2.9 billion. Competitive forces have been effective in bringing down the price of bids, in part due to the innovative range of financial and technical solutions employed by the market. This has lowered costs for consumers which, for the first round of OFTO transactions, were between £200 and £400 million lower than alternative approaches[43], whilst for the second and third tender rounds savings to consumers are estimated to be between £428 and £749 million.[44]

[41] See modification of licence condition here: https://www.ofgem.gov.uk/publications-and-updates/competition-connections-modification-standard-licence-conditions-electricity-distribution-licence

[42] See Code of Practice here:http://c3705.paas1.ams.modxcloud.com/assets/files/15014_CiCCoP_final.pdf

[43] See open letter here: https://www.ofgem.gov.uk/ofgem-publications/87716/140508coveringlettertocepareportfinalforpublication.pdf

[44] See OFTO rounds 2 and 3 information here: https://www.ofgem.gov.uk/publications-and-updates/evaluation-ofto-tender-round-2-and-3-benefits

We are also well in to the process on a fourth tender round[45] and recently launched a fifth[46], the combined asset value of which is in excess of £2 billion.

3.59. We are also working with government to extend competitive tendering to new, separable and high-value onshore electricity transmission assets. We expect that competitive pressure and the involvement of new parties is likely to drive innovation, leading to lower costs and better value for consumers. We could expect innovations in areas such as technology, design, supply chain management, the raising of finance and development in operations processes. We have published a range of documents setting out further regime developments on our website.[47]

3.60. While the OFTO regime has not yet involved design and construction, an onshore approach would and, therefore, stands to bring even greater contestability and innovation.

3.61. Separately, we also regulate the market-led delivery of cross-border electricity interconnection, primarily through our cap and floor regime. Projects that have been successful through our assessment process include the interconnectors to Belgium, Norway, France, Denmark and Ireland. By creating a developer-led regulatory framework with a strong merchant incentive, we are enabling innovation in the design, delivery, financing, long-term ownership and maintenance of these assets. We are now reviewing a second application round of potential projects, including interconnectors to Germany, France and Norway.

[45] See OFTO rounds 4 information here: https://www.ofgem.gov.uk/electricity/transmission-networks/offshore-transmission/offshore-transmission-tenders/tender-round-4

[46] Further information about potential projects to be included in the 5th tender round are included in a slide pack here: https://www.ofgem.gov.uk/system/files/docs/2016/03/tr4-event-slides_final.pdf

[47] See here for more information on competition in onshore transmission: https://www.ofgem.gov.uk/electricity/transmission-networks/competition-onshore-transmission

4. Technology, regulation and efficiency

Chapter Summary

This chapter responds to the government's third question about how regulators could better use new technology to generate efficiency savings and reduce burdens on business.

Improving competition in the retail energy market

Supplier switching programme

4.1. We are leading a major programme to overhaul the current systems and processes for consumers switching their energy suppliers. We will design and put in place new arrangements that use technology to underpin a new reliable, fast switching service. This will harness the benefits of smart meter data. More customer engagement, underpinned by easier energy supplier switching, will create more competitive pressure in the market.

4.2. Greater competition will lead to more innovation, as suppliers strive to attract new customers and retain existing ones. An important design principle is that new arrangements should be as simple as possible and harmonise the processes for both gas and electricity. This will promote effective competition and help new joiners enter the market.

4.3. We have worked with industry to develop possibilities for the new switching arrangements. These include assessing the options presented by technology to deliver the new arrangements, and looking at how the information available to customers in a smart meter world can help deliver a fast reliable switch. We will be seeking information on the costs of different options in January 2017.

Using technology to reduce burdens on business

Administering government's programmes

4.4. Our E-Serve division administers a number of schemes on government's behalf. These range from renewables incentives to energy efficiency and social programmes. These schemes have had major impacts on energy investment, generation and consumers. While our duties do not include policy responsibilities for these programmes (these are government schemes), they do represent a core feature of UK energy innovation policy.

4.5. Innovation is at the heart of everything we do, from how we work with government to how we process scheme applications. Our effective administration of the schemes aims to provide excellent value for money for taxpayers. In 2016/17 we will deliver over £6.5 billion of government environmental programmes at a cost less than 0.4% of the total schemes' value.

4.6. Our Operational Excellence Programme oversees our culture of continuous improvement. We have made over 20% savings over the last two years and will achieve further efficiencies over the coming year. In 2016/17 we will further optimise our processes to reduce transaction costs and improve the quality of service for scheme applicants.

4.7. Examples of our programme management innovations include:

- The IT system supporting the Domestic Renewable Heat Incentive (RHI) scheme was tested with consumers before launch. It allows more applications to be submitted and processed faster, saving approximately £3m over the life of the scheme.
- The Non-Domestic RHI scheme uses IT to move participants to automated system calculations (based on consumers' manual meter readings). Early indications show the error rate has dropped from 30% to 8%, reducing administration costs.
- Wherever possible we use digital channels to deliver schemes and communicate with stakeholders. We've developed a number of web-based application systems, making scheme administration more efficient.
- Across the energy efficiency and social programmes we have worked closely with suppliers to simplify reporting requirements and to help them meet their obligations, thereby reducing the administrative burden.
- We have always published detailed scheme-related information. In 2016/17 we are expanding the scope of this to include more performance-related metrics and an online mapping tool providing regional / constituency level output data. This innovative approach should increase efficiency for stakeholders and Ofgem, lessening the need for stakeholders to submit Freedom of Information requests.
- We want to ensure that we are doing all we can to uphold the high standard of customer service that scheme applicants expect and we’re using our customer insight tool to monitor customer satisfaction across schemes. Surveys allow us to monitor satisfaction across schemes, and act as a key source of feedback so we can keep improving our customer service.

Engagement with stakeholders

4.8. We are committed to providing clear and useful data on the energy market in user-friendly formats. We have made good progress in sourcing, collating and publishing important datasets and interactive charts on our website.[48] This information is well-liked by the media and other commentators and stakeholders.

4.9. Looking ahead, we will explore ways of developing this information in response to the needs and interests of our audience. We expect to add to the content and usability of our information throughout 2017, establishing Ofgem as the trusted, independent source of data on energy market performance.

[48] See Ofgem Monitoring the Market page here: https://www.ofgem.gov.uk/monitoring-market

5. Looking forward

Chapter Summary

This chapter sets out how we will progress our work to ensure the regulatory system is agile and flexible, and that it facilitates innovations that are in consumers' interests.

5.1. While in many areas the regulatory framework already accommodates, enables and responds to the needs and potential of innovations, the scale and scope of the transformation means that the regulatory framework will need to continuously adapt and evolve. The need for agility and adeptness was one of the key points that stakeholders made during the NTBM consultation process. As identified in chapter 2, we anticipate further innovations in the areas of flexibility services, network management, retail services, aggregation, and new approaches to consumer engagement and value creation.

5.2. We are committed to ensuring that the regulatory system is agile and flexible, and that it facilitates innovations that are in consumers' interests. We will continue to engage with stakeholders to ensure this is possible.

5.3. As this report shows, innovation is a business as usual consideration for us and permeates all aspects of our duties. But that's not to say that the job is done. We cannot be certain that today's regulatory regime will be open to the potential of tomorrow's disruptive innovation. In other sectors the unforeseen emergence of disruptors like Uber in the transport sector, and Airbnb in the accommodation sector are examples of this.

Future actions

Stakeholder engagement

5.4. Talking to stakeholders helps keep us abreast of what's emerging in the market. This is crucial for ensuring the regulatory system is flexible and open to potential innovations of benefit to consumers. Over recent years we have extended our engagement to reach new stakeholders, for instance through our work on NTBMs and flexibility. We will continue to review our approach to stakeholder engagement to ensure that it is as effective as possible.

5.5. We encourage stakeholders to continue to engage through our current projects that are involved with different aspects of innovation.

Competition and Markets Authority energy market investigation

5.6. As mentioned in chapter 3, the Competition and Markets Authority has undertaken an investigation into the energy market. The CMA published its final report in June 2016. We welcome the report and consider that the remedies proposed will support the transition to a 'smart' market with disruptive competition and engaged consumers. We have published information on our approach to implementing the CMA's remedies in our Implementation Plan.[49]

5.7. We also welcome the attention the CMA has placed on the arrangements which govern modifications of the industry codes. The codes play vital roles in allowing innovative business models and technology to become integrated into the energy system, and in maximising the benefits that they can deliver.

5.8. The report signals an overhaul of industry governance and processes. The CMA proposed to the government, the introduction of a licensing regime for code bodies and recommended that we make wider reforms to the code governance arrangements. As with the rest of the CMA's remedies package, we will work with stakeholders in order to deliver the CMA's recommendations on code governance. We have published our first consultation on our approach to implementing the CMA's remedies for code governance.[50]

Innovation Link

5.9. Innovators, especially those that are new entrants, tell us they have trouble navigating the regulatory arrangements of the energy sector and that this can give rise to barriers. We want to ensure we support these innovators and we are launching a new service to do this: the Innovation Link.

5.10. The Innovation Link offers innovators a dedicated team to provide fast, frank feedback on the regulatory framework and what it might mean for them. This service has certain terms and eligibility criteria.[51] Interested parties should contact the team at innovationlink@ofgem.gov.uk.

[49] See here for our CMA Remedies Implementation Plan: https://www.ofgem.gov.uk/publications-and-updates/cma-remedies-implementation-plan

[50] See here for our consultation on implementing the CMA's code governance recommendations: https://www.ofgem.gov.uk/publications-and-updates/industry-code-governance-initial-consultation-implementing-competition-and-markets-authority-s-recommendations

[51] Eligible proposals must be innovative and have benefit to consumers, and their developers must be able to demonstrate they have attempted to understand the regulatory implications themselves and that they have a need for support. Depending on the nature of any feedback we give, we may stipulate that our feedback is non-binding and confidential. Further information is available on our website: https://www.ofgem.gov.uk/about-us/how-we-engage/innovation-link

5.11. We're considering options for a 'regulatory sandbox' to enable new products or services to be trialled within the existing regulatory framework. The purpose would be to create a controlled regulatory environment to give innovators an opportunity to test a new product or business model, whilst ensuring that the interests of consumers continue to be met. In developing our ideas we will look at examples from different regulated sectors and jurisdictions.[52] We'll bring forward proposals in Spring 2017.

5.12. We're also developing a programme of general support to help innovators get started in understanding the regulatory framework. We're developing our thinking around what the programme could include. Our ideas include providing seminars / webinars and / or published information targeted at early-stage innovators to help them understand the regulatory framework. This will launch early in 2017.

5.13. The Innovation Link initiative is one way we can enable innovative ideas that bring benefits to consumers. It also helps us understand emerging trends in the sector, and identify areas in which regulation may need to adapt to support innovation.

Insights for future regulation – horizon scanning

5.14. As set out in our 2016/17 Forward Work Programme[53] we have been undertaking an horizon scanning exercise to better understand what is driving change in the energy system and markets, the potential impacts on consumers and the implications for regulation. We published an open letter in March setting out our approach, what we mean by horizon scanning and how stakeholders could get involved.[54]

5.15. Over the summer period we hosted workshops across GB and engaged with over 130 stakeholders from inside and outside the energy sector to explore the focal question of our horizon scanning work: "What are the drivers of energy system and market change that have the most material impacts on consumers and implications for regulation?" We also tested our emerging findings with an expert academic panel. This process helped us identify and prioritise those high impact, high uncertainty drivers that would require further attention.

[52] The notions of 'regulatory sandboxes' and 'spaces for experimentation' are receiving attention across different regulated sectors and jurisdictions. For instance, financial and telecommunications regulators in the UK, Australia, the US and wider-afield are exploring and putting in place sandbox arrangements. Software developers often use sandboxes, allowing others to access an element of their programme without harming the host platform; it allows for experimentation before ideas are introduced on a wider-scale. Entrepreneurs also use sandboxes to test new ideas, assess consumer responses and study emerging markets.

[53] The Forward Work Programme is available here https://www.ofgem.gov.uk/publications-and-updates/forward-work-programme-2016-17

[54] The open letter is available here: https://www.ofgem.gov.uk/publications-and-updates/open-letter-call-engagement-insights-future-regulation

5.16. The first output from this process, the Future Insights Series 'Overview Paper', was launched in October. This was followed in November by an insights paper on the 'Decarbonisation of Heat'[55]. We will publish a companion paper on 'Local Energy' soon and other papers on key issues arising from our analysis in the period up to March 2017.

5.17. One of the biggest, and some would say unsurprising, insights emerging from this process, is the scale of uncertainty and the challenge this presents for policymakers and regulators. One of the main conclusions from the Overview Paper was that:

> *Our approach to the regulation of the energy market needs to remain relevant and responsive in the face of rapid energy system change. As we can't know the future, we need to rely more on learning and be flexible in our approach.*
>
> *Flexibility is one of the strengths of market-based solutions compared to other approaches. But, to function effectively, energy markets need a robust and responsive regulatory and policy framework that protects and empowers consumers and encourages beneficial innovation[56].*

[55] See here for the Decarbonising Heat insights paper: https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-future-insights-series-decarbonisation-heat

[56] See here for the Future Insights Overview Paper: https://www.ofgem.gov.uk/system/files/docs/2016/10/future_insights_overview_paper.pdf