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RPI-X@20

Regulating energy networks for the future: RPI-X@20 Principles, Process and Issues

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Target audience: Consumers and their representatives, gas and electricity transmission and distribution companies, generators and offshore producers, energy suppliers, gas shippers, government, the city, academics and other interested parties.

Overview:

In March 2008 we announced the RPI-X@20 project, which will review our current approach to energy network regulation and consider what changes need to be made for the future. Over the last twenty years our approach has delivered increased capacity and investment, higher reliability and lower network prices. However, there are a number of reasons why we should review our approach. In particular, our recent Long Term Energy Network Scenarios project showed the significant impact that tackling climate change could have on the size and shape of future energy networks. With a range of technologies being developed, it is unclear whether we will need much larger or smaller transmission and distribution networks to deliver the low carbon economy.

This is the first in a series of consultation documents, following a series of workshops with industry, investors, customers and academics. We set out the rationale for the review, our objectives, the timetable and our thoughts on the key issues that the review should cover. We also present some ideas on options for change. We welcome views on whether we are looking at the right issues during the 'visionary' phase of the project. We aim to complete the project in the summer of 2010. Any changes to our approach will be implemented in subsequent price reviews, starting with the next transmission review.

Contact name and details: Hannah Nixon, Director, Regulatory Review

Tel: 020 7901 7165

Email: RPI-X20@ofgem.gov.uk

Team: RPI-X@20 and Regulatory Finance

Context

Gas and electricity transmission and distribution networks have been regulated under an incentive-based revenue control ("RPI-X") since privatisation. This approach has delivered significant improvements in the operating efficiency of the companies, lower prices for consumers, improved network reliability and increased investment to maintain and increase network capacity and reliability.

Despite the success of the regulatory regime we think now is an appropriate time to take a step back and consider whether the existing framework of regulation remains fit for purpose.

- In line with our primary duty, we need to consider whether we and the networks are sufficiently focused on the needs of current and future consumers. There are questions about how we and the networks engage with consumers. There are also questions about how we encourage networks to deliver value for money, and high quality and reliable supplies to consumers.
- We also need to consider whether the existing regulatory framework provides enough encouragement and flexibility for network companies to facilitate the delivery of the government's sustainable development agenda. This includes the delivery of security of supply, the low carbon economy and social targets. We need to understand whether changing demands on the networks require changes to the way we regulate.

These issues will be central to RPI-X@20.

We are running the review in two parts. In the first 'visionary' phase we aim to understand all the issues affecting energy networks and network regulation, and to identify areas where change may be needed. The second phase will involve the narrowing of the scope of the project and a detailed analysis of identified key issues and potential options for change. Conclusions and recommendations will be made to our Board in summer 2010, with recommendations potentially being implemented in the next transmission price review (TPCR5).

Associated Documents

- Alistair Buchanan, CEO Ofgem - Beesley Lecture, London, 2 October 2008, "Is RPI-X still fit for purpose after 20 years? http://www.ofgem.gov.uk/Media/keyspeeches/Documents1/BEESLEY%20LECTURE%20OCTOBER%202008.pdf
- Alistair Buchanan - Speech at SBGI, 6 March 2008 - Ofgem's "RPI at 20" project http://www.ofgem.gov.uk/Media/keyspeeches/Documents1/SBGI%20-%206%20MARCH.pdf
- Ofgem, RPI-X@20 Update Sheet http://www.ofgem.gov.uk/Networks/rpix20/publications/factsheets/Documents1/RPI-X@20ofgemupdates%20-%20glossy.pdf
- G Ault, D Frame, N Hughes and N Strachan (2008), Electricity Network Scenarios for Great Britain in 2050: Final Report for Ofgem's LENS Project, Ref 157/08, http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/lens/Documents1/20081107Final%20Report.pdf

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Foreword

With standing room only at a recent RPI-X@20 workshop and with excellent attendance at our "outreach" meetings it is clear that this project is right timed! It also captures Ofgem's general strategic positioning of looking forward. Project Discovery, the Governance Review and the Retail Probe remedies being just three other "forward looking projects" we are currently managing. I am particularly excited about how RPI-X@20 will embody two new statutory duties of Ofgem: "future consumers" are now in our primary duty and our "sustainable" duty now has a pre-eminence amongst our secondary duties.

This document "sets the scene" for the RPI-X@20 review and we make no apology for its ambition. The Board has confirmed recently that it wants "no stone unturned" and to address a holistic vision for a broad policy framework. As I mentioned in my October 2008 Beesley Lecture, the team must have as an option "no change", but already I am fascinated by the outputs of the debate.

In brief I am keen to hear views, amongst other things, on:

- The arguments for wider involvement, particularly of consumers, in both the regulatory framework and appeal processes;
- The extent to which environmental issues should lead this review; and
- The scope and scale of the promotion of innovation.

I am not deaf to the criticism over the proposed timetable for this the review but I would urge you to understand our parameters:

- We need to carry many audiences in this first detailed review of "RPI-X" in twenty years. These include consumer groups, capital markets, Government et al.
- RPI-X@20 can capture and respond to key announcements in 2009. Amongst which are the views of the newly created Consumer Focus, the Climate Change Committee and Europe's evolving institutional structures. Further Ofgem's Project Discovery and Corporate Governance reviews could well impact RPI-X@20.
- In general there is only a "rush" to fix something if it is broken – this is not the case with our current regime, which continues to serve consumers well. A "rush" job also sometimes equates with a "botched job". We intend to avoid both criticisms.

Finally I would like to thank everyone who has engaged with us on this project so far. Please do continue to help us. Steve Smith and Hannah Nixon lead a team committed to utilising an opportunity that rightly only comes around at irregular intervals.

Alistair Buchanan CBE, Chief Executive

Executive summary

RPI-X@20 is our two-year review of the way we regulate Britain's gas and electricity networks. We are using the review to step back and consider holistically the appropriate regulatory framework. The timeframe allows us to develop proposals that could potentially be implemented in the next transmission control starting April 2012. It also allows us to take the time to engage fully with stakeholders and adopt a considered approach to assessing a range of fundamental and complex issues.

This is our first RPI-X@20 consultation document. It draws on the outputs of the various workshops we have held over the last few months. Its purpose is to set out:

- the aims and objectives of the review, and the rationale for conducting it;
- the way in which we intend to carry out the review; and
- the key issues and questions that we think need to be addressed by the review.

It does not set out any specific proposals on the future of energy regulation.

We recognise that RPI-X has delivered well for consumers. Nevertheless, there are good reasons for RPI-X@20. The energy sector is facing new and uncertain challenges and it is important to consider whether the existing regulatory framework remains fit for purpose.

The focus of energy network regulation has shifted, from a primary focus on achieving efficiency towards facilitating efficient delivery of the low carbon economy and continued security of supply. This is occurring at a time of heightened concern about fuel poverty and wider social issues.

As demonstrated by our recent Long Term Energy Network Scenarios (LENS) project, the shape of the energy networks required to deliver on these challenges is very uncertain, especially in the longer term. This is because there is a range of emerging technologies - in generation (microgeneration, renewables, carbon capture and storage), networks ("Smartgrid" technology) and supply (smart metering, electric vehicles) that could change how much energy we use and how the networks are run. We don't yet know which of these technologies will succeed as their costs and effectiveness are still unknown. But they could impact profoundly on the shape and size of the transmission and distribution networks we need.

Delivering a sustainable energy sector will require innovation, potentially involving changes in the business culture and operational practices of network companies, to test and deploy new network technologies, ensure existing network assets are used effectively, and ensure capital investment is efficient.

The level of uncertainty about the future role and direction of networks is unprecedented, at least in the period since privatisation. Over the last twenty years, there has been little technical innovation that has challenged the way network companies plan, invest and operate their networks. Forecasting future network

requirements has primarily been about predicting energy demand growth (driven largely by economic growth) and there has been reasonable confidence that, over their long lives, assets would be used.

We have had feedback from stakeholders that RPI-X has performed well to date, but there is concern about its ability to meet these challenges going forward. We have been encouraged to step back and fundamentally review the objectives and boundaries of regulation, as well as methodological issues. In doing this we need to consider interactions across the energy supply chain.

The scope of RPI-X@20 is broad. In the visionary phase of the project we will consider a wide range of issues relating to two inter-related themes.

- **Focus on consumers**: Concerns have been raised that network companies, and potentially the regulatory process, are not sufficiently focused on consumers. Issues here range from identifying what consumers want and are willing to pay for, to the alignment of incentives between networks, users of the network (such as generators, gas producers and suppliers) and consumers.
- **Delivering a sustainable energy sector**: As discussed earlier, achieving the environmental targets and ensuring security of supply requires innovation, possible changes in the role of networks, and increased investment.

These themes are consistent with our duties. They are also consistent with our ongoing work on the distribution price control review (DPCR5) and the transmission access review (TAR), and they are in line with EU Energy Policy. The focus of our review is also consistent with the work of the Energy and Climate Change Select Committee looking at "The Future of Britain's Electricity Networks".

Within these themes, we will consider a range of questions relating to efficient investment, financeability, innovation, risks around capacity availability and asset stranding, and the impact of decisions today on future options and future consumers.

We have no fixed ideas about the appropriate way forward for regulation at this stage. The future regulatory framework may be an evolution of RPI-X or may be something different. An evolutionary approach might be most appropriate if we were only looking at the continuing role of networks in meeting consumer needs, security of supply and the social agenda. However, the scale and uncertainty of the challenge involved in meeting government environmental targets is new. This raises a real question as to whether a different more flexible regulatory framework is needed.

We think that ongoing engagement with interested parties is vital to the success of RPI-X@20. We therefore welcome responses to this consultation and we will continue to provide a range of opportunities for parties to contribute to the debate.

1. Introduction

Chapter Summary
This chapter sets out our reasons for reviewing the current regulatory regime for network companies, the proposed scope of the review, proposed themes for the review, and the proposed timetable.

Question 1: Do you have any comments on the rationale for the review?
Question 2: Do you agree with the proposed scope of the review?
Question 3: Do you think the proposed themes for RPI-X@20 are appropriate?
Question 4: Do you have any views on our proposed approach for engaging with stakeholders?
Question 5: Do you have any comments on the timetable for the review?

1.1. We announced in March 2008 that we would undertake a two-year review of the existing "RPI-X" regulatory frameworks for GB gas and electricity transmission and distribution networks. This review will enable us to step back and consider in a full and holistic manner the appropriate regulatory framework; in a way that is not possible within the time constraints of a normal price control review process.

1.2. We intend to report our conclusions and recommendations to our Board - the Authority - in Summer 2010. If these are accepted, we will phase implementation of the recommendations appropriately. TPCR5 will be the first review directly affected by any recommendations agreed by the Authority.

1.3. This is our first consultation on RPI-X@20. The paper sets out:

- the aims and objectives of the review, and the rationale for conducting it;
- the way in which we intend to carry out the review, and the principles we are adopting; and
- what we believe to be the key issues and questions that need to be addressed by the review.

1.4. The document does not set out any specific proposals on the future of energy regulation. We have no preconceptions of what our recommendations will be.

1.5. This document draws heavily on the outputs of the various workshops that we have held over the last few months. We are grateful to all those who have participated in these events.

Why are we doing this review?

1.6. We recognise that RPI-X has delivered well for consumers over the last twenty years since privatisation. Nevertheless, there are good reasons why now is a good time to step back from the detail of price reviews and check whether the existing regulatory framework continues to be fit for purpose.

Good housekeeping

1.7. It is more than 20 years since the current RPI-X@20 regulatory framework was originally implemented for energy networks. As policy issues have evolved, so has the regulatory framework. We also observe different versions of RPI-X across regulated sectors in GB and overseas. However, the fundamental construct has remained unchanged. RPI-X@20 provides the opportunity to consider whether the current RPI-X framework remains fit for purpose.

New and uncertain challenges for energy networks

1.8. The energy sector is facing new and uncertain challenges, as confirmed in December by the Secretary of State: "There is no question that compared to the 1980s we are in a world of huge challenge on energy."[1] We need to be sure that the regulatory framework enables networks to meet these challenges.

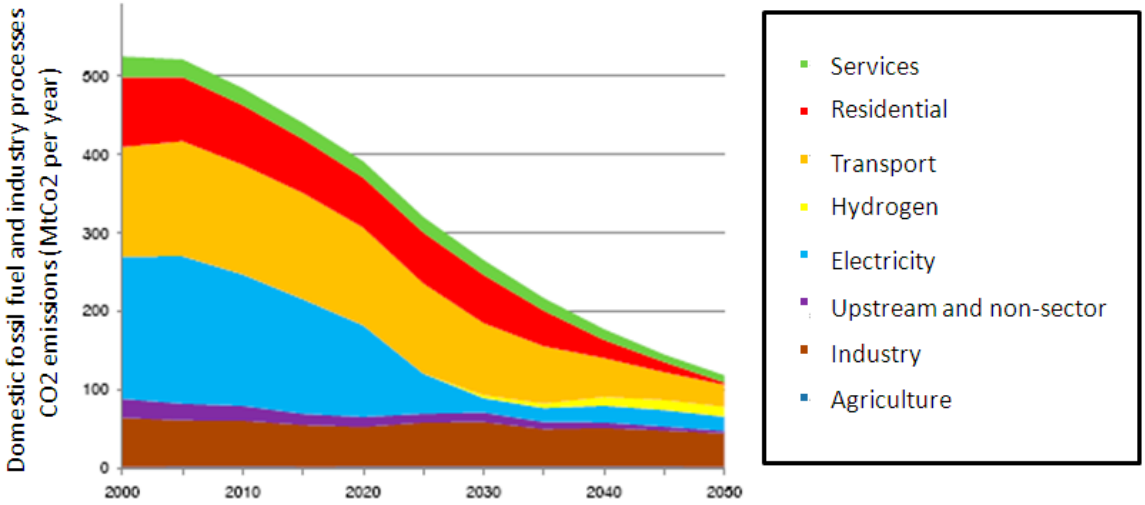
1.9. The focus of energy network regulation has shifted from achieving operating efficiency gains towards facilitating delivery of environmental targets (the low carbon economy) and continued security of supply. This is occurring at a time of heightened concern about energy prices and fuel poverty.

1.10. The range and precise nature of the sustainability requirements on the energy sector, and specific implications for the networks, are uncertain and may change over time. Around 12GW of generation plant (8GW of Coal and 4GW of Oil) is set to switch off due to the environmental constraints imposed by the Large Combustion Plant Directive. In addition to this, it is anticipated that some nuclear power stations will switch off between now and the end of 2015.

1.11. Meanwhile, the government is committed to reaching challenging climate change targets in the medium and long term. The Climate Change Committee (CCC) recommended[2], in December 2008, that UK greenhouse gas emissions be reduced by 26% by 2020 and 80% by 2050. To help deliver this target, the CCC recommends that electricity should be almost completely decarbonised by 2030[3]. The impact is illustrated in Figure 1. These targets were accepted in principle by government in December 2008.

[1] Ed Miliband lecture: "The Rise And Fall And Rise Again Of A Department Of Energy", 9 December 2008
[2] Committee on Climate Change, 'Building a low carbon economy - the UK's contribution to tackling climate change', December 2008
[3] The CCC states "it is likely that a key feature of the future optimal path will be the almost complete decarbonisation of electricity generation, and the extension of electricity to a wider range of energy end uses (in particular transport and heat). This implies that rapid progress in electricity decarbonisation is vital."

Figure 1: UK Sectoral CO2 emissions to 2050 (80% reduction path)



Source: Committee on Climate Change, 'Building a low carbon economy - the UK's contribution to tackling climate change', December 2008. Figure 2.29, page 79.

1.12. Delivery of a sustainable energy sector, and the '20-20-20'[4] targets, are also central to developments in the Second EU Strategic Energy Review[5] and finalisation of the Third Internal Energy Market Package. Discussions at our industry workshops suggest that there is uncertainty about the implications of these policy developments for the future role and direction of energy networks.

1.13. The Working Group of the Electricity Networks Strategy Group (ENSG) is developing a range of scenarios for the electricity transmission network to 2020 to deliver climate change targets. Furthermore, our recent LENS study, discussed in more detail in Appendix 2, demonstrates the considerable uncertainty about the long-term shape and size of electricity networks required to meet these challenges. It is unclear whether we will need much larger transmission and distribution systems to deliver this. A move to more local energy production and much greater energy efficiency could require "micro-grids".

1.14. The low carbon economy could also have significant impacts on the size of the gas transportation and distribution system we need. A significant proportion (33%[6]) of UK CO2 emissions come from domestic premises. Meeting our targets is going to require significant changes to the way we heat our homes. Better insulation and the use of ground source heat pumps and/or fuel cells could lead to a significant

[4] 20% reduction in greenhouse gas emissions, 20% share of renewable energy in EU final energy consumption and 20% improvement in energy efficiency by 2020.
[5] European Commission, 'Second Strategic Energy Review: An EU Energy Security and Solidarity Action Plan', Communication from the Commission to the European Parliament, the Council, the European Economics and Social Committee and the Committe of the Regions', November 2008.
[6] BERR (2008), Energy Trends, March. Data relates to CO2 emissions by end user in 2007.

reduction in demand on the gas distribution networks. Increasing renewables (and nuclear) could also see a reduction in the use of the gas transportation network by power generators - who currently account for about one third of gas transported[7].

1.15. The level of uncertainty about the future role and direction of networks is unprecedented, at least since privatisation. In the last twenty years, there has been little innovation that has challenged the way that network companies plan, invest and operate their networks. Forecasting future network requirements was primarily about forecasting energy demand (driven largely by economic growth) and there was reasonable confidence that, over their long lives, network assets would be used. This is changing. Measures to tackle climate change could have a profound impact on the size and shape of future energy networks. And the rapid reduction in costs of smart metering and network control technology could lead to "smart networks".

1.16. The regulatory framework of the future will need to be able to manage the uncertainty and be sufficiently flexible to adapt to industry changes.

Concerns about the complexity of the current approach

1.17. There are concerns that the framework has become too complex, making it difficult to understand, respond to consultations and effectively engage in the process. The complexity may also create unintended incentives within the regime. We will consider whether the framework can be simplified without loss of value.

Industry views

1.18. There has been strong industry support for a reassessment of the regulatory framework[8]. We heard at our workshops that the RPI-X regime was not necessarily "broken" but there are questions about how significant investment can be delivered in the future. There were also concerns about the lack of focus on consumers.

1.19. Our academic workshop[9] emphasised that the sector is entering a period of significant change. Regulatory models that worked well in a less uncertain world may need to adapt, and regulation may need to accommodate changing interactions along the supply chain (e.g. between generators, networks and suppliers).

[7] BERR (2008), Digest of Energy Statistics (DUKES). 33% of total gas demand was from electricity generation in 2007.
[8] See, for example, quotes from senior company executives in Alistair Buchanan - Speech at SBGI, 6 March 2008 - Ofgem's "RPI at 20" project, and summaries of our workshops on our website: http://www.ofgem.gov.uk/Networks/rpix20/publications .
[9] A summary of the workshop can be found at: http://www.ofgem.gov.uk/Networks/rpix20/publications.

1.20. Our Advisory Panel[10] and expert advisers have also confirmed the general perception that it is time for a broad review of the fundamentals of the regulatory framework. The government too has signalled that it is time to review the future of the networks, for example through the work of the Energy and Climate Change Select Committee on "The Future of Britain's Electricity Networks". Furthermore, ongoing developments on both the internal market and EU sustainability goals signal a move for change in the role of both the networks and regulation at EU levels.

What is the scope of the review?

1.21. We are reviewing the regulatory framework designed to protect consumers from monopoly behaviour by the energy networks (characterised by excessive prices, low quality of service and/or constrained or limiting access to the networks). When RPI-X@20 was first announced, the expectation was that the review would be primarily about ensuring that the regulatory framework facilitated the efficient delivery of network investment requirements, and resolving a number of methodological issues (e.g. depreciation and financeability).

1.22. We now think that a broader scope is needed, at least initially. Since the review was announced there have been a number of legislative changes[11] and developments in domestic and EU energy and environmental policy[12]. Our understanding of the uncertainty facing networks has also progressed, driven by our LENS study, the Energy Market review and ongoing monitoring of the gas and electricity markets. We have also observed significant changes in financial markets and the wider economy.

1.23. Discussions at our workshops suggests that we should take a step back and undertake a more fundamental review of the objectives and boundaries of regulation, as well as methodological issues. This needs to be done in a holistic way rather than looking purely at the individual networks in the energy supply chain.

1.24. We therefore intend to have two, roughly equal, phases to the review:

- **Visionary phase**: In the first phase we aim to understand the issues affecting network regulation and identify areas where change may be needed. We are ruling nothing out of scope in this stage. The phase will culminate in the publication of an emerging thinking consultation document in November 2009.
- **Options development phase**: The second phase will involve the narrowing of the scope of the project and a detailed working up of options identified as having

[10] A list of Advisory Panel members can be found on our website.
[11] For example, the Energy Act 2008, the Climate Change Act 2008 and the Planning Act 2008.
[12] For example, the Climate Change Committee made recommendations on the low carbon economy in early December 2008; DECC published consultations on Heat and Energy Saving Strategy, Community and energy Saving Programme and a 20% increase to CERT in February 2009. EU policy is also developing, through the finalisation of the Third Package and development of the 2nd Strategic Energy Review.

high potential. This phase of the project will culminate in a set of conclusions and recommendations that will be delivered to the Authority in summer 2010.

Themes for RPI-X@20

1.25. Historically the primary focus of energy network regulation was on ensuring delivery of operating efficiencies whilst maintaining security of supply and improving customer service. Going forward, we expect the focus to be on delivering a sustainable energy sector. In line with our duties, we need to ensure this is balanced with meeting the needs of current and future consumers.

1.26. We intend to focus on two themes in the visionary phase of RPI-X@20. These are the primary themes of this consultation paper.

- **Focusing on consumers' needs**: an effective regulatory regime will ensure that we and the networks focus on meeting the needs of consumers (current and future). This means engaging with consumers, understanding their needs, and ensuring that networks provide value for money and quality of service.
- **Delivering a sustainable energy sector**: an effective regulatory regime will encourage regulated networks to facilitate the delivery of a sustainable energy sector. This incorporates security of supply, climate change targets and ultimately the low carbon economy, and social objectives (e.g. for fuel poverty).

1.27. These themes are consistent with our duties and we are already working on these areas in the distribution review (DPCR5) and the transmission access review (TAR).

1.28. We discuss in Chapters 4 and 5 the issues that we believe the review will need to consider in relation to each theme. We recognise that the two themes are inter-related in the sense that efficient delivery of a sustainable energy sector is likely to require increased communications with consumers. This may be through the adoption of new "smart" technologies and/or evolving commercial relationships.

1.29. The wider review will also take account of the need to ensure that energy networks are efficient and that they innovate where appropriate. We also need to consider the treatment of uncertainty, sharing of risks, and the associated balance of risk-return-performance for the networks. Ensuring the efficient delivery of their functions is financeable for networks will be central to any new regulatory framework as well.

How will we engage with stakeholders?

1.30. The issues to be addressed by RPI-X@20 are many and complex. If the review is to be successful, we need to draw on the expertise of a range of stakeholders.

1.31. We have already held a number of workshops. These have been invaluable in helping to shape our thinking on the key issues for RPI-X@20. We have put in place a number of channels whereby stakeholders can continue to engage with us.

- **Consultation documents:** we intend to publish two further consultation documents and a final decision document. These will provide an update on our thinking and allow interested parties to express their views formally.
- **Seminars and workshops:** From the inception of RPI-X@20, we have sought to engage with interested parties through workshops and seminars. We will continue to hold workshops and seminars to discuss our emerging thinking in 2009. Our next workshop is planned for Monday April 6th 2009.
- **Working groups**: It is clear that there is a wide range of issues to consider in RPI-X@20 and a number of interested parties have expressed an interest in getting more involved with the review. We are therefore proposing to establish small working groups to develop thinking on specific issues during 2009.
- **Web forum**[13]**:** We launched the RPI-X@20 web forum in November 2008. You will find our publications on the site, as well as papers from academics and consultants. We are hoping that the forum will be used by a broader community, with interested parties submitting pieces to stimulate debate.

1.32. The views and ideas of a range of stakeholders are also provided through our high level Advisory Panel and existing Ofgem processes including the Environmental Advisory Group and the Sustainable Development Committee of the Authority.

What is the timetable for RPI-X@20?

1.33. RPI-X@20 is a two-year review. The timeframe allows us to develop proposals that could potentially be implemented in TPCR5. It also allows us to take the time to engage with stakeholders and adopt a measured approach to assessing a range of fundamental and complex issues. The proposed timetable is set out in Figure 2.

Structure of the document

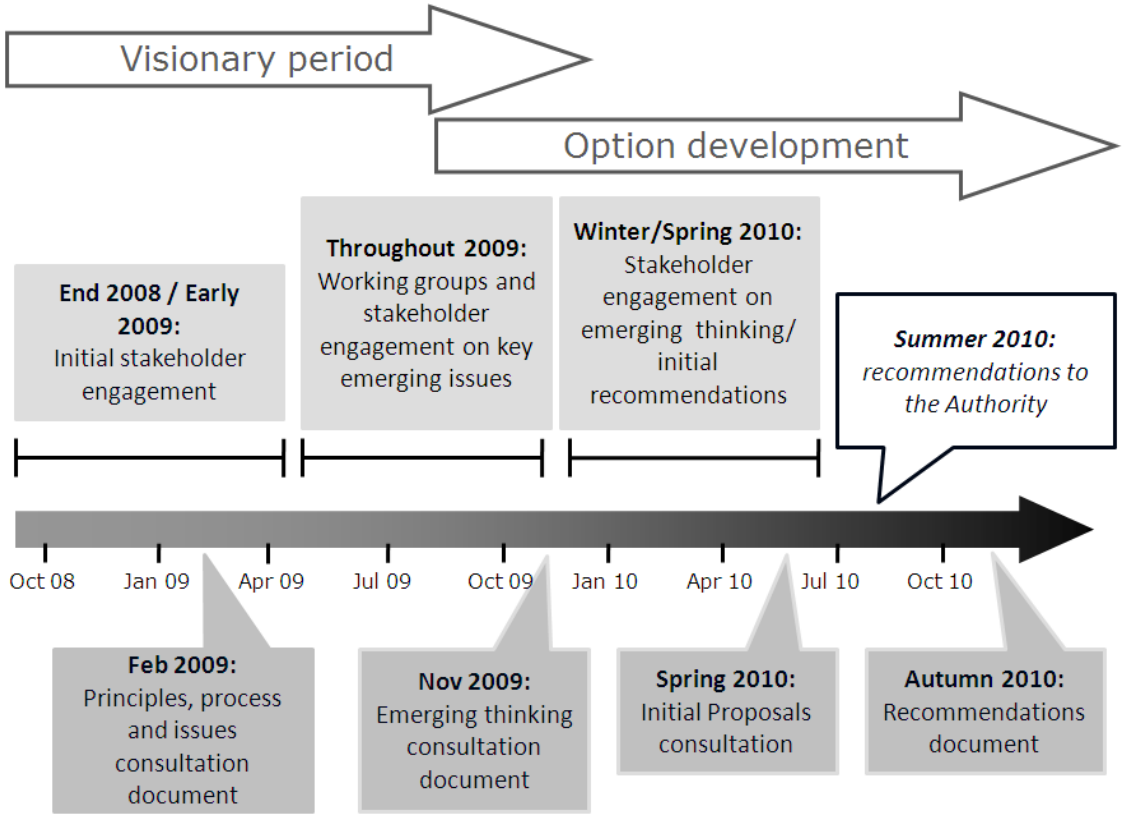
1.34. The remainder of the document is structured as follows:

- Chapter 2 describes the aims, principles and process of the review;
- Chapter 3 sets the scene for RPI-X@20;
- Chapter 4 discusses the "Focus on consumers' needs" theme;
- Chapter 5 discusses the "Delivering a sustainable energy sector" theme.
- Chapter 6 presents preliminary ideas on the future regulatory framework.
- Chapter 7 describes next steps in RPI-X@20.

[13] http://www.ofgem.gov.uk/Networks/rpix20/forum/Pages/forum.aspx

1.35. We are simultaneously publishing a number of supporting papers on the history of energy regulation and the performance of energy networks on our website.[14]

Figure 2: Timetable for RPI-X@20



Responding to this document

1.36. We would welcome the views of interested parties regarding all aspects of this consultation document, particularly the questions set out within each chapter. Responses should be sent to the RPI-X@20 team no later than 24 April 2009. Details of how to respond can be found in Appendix 1.

[14] http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx

2. Aims, principles and approach of the review

Chapter Summary
This chapter sets out the aims of the review, the key principles that we expect to adhere to when conducting the review, and our proposed approach to the review.

Question 1: Do you have any views on our aims for RPI-X@20?
Question 2: Do you think the principles for undertaking the review are appropriate and sufficient?
Question 3: Do you have any views on our proposed approach to the review?
Question 4: Do you have any comments on the inter-relationships between RPI-X@20, other Ofgem projects and EU and national policy developments?

2.1. We think it is important to be open and transparent throughout RPI-X@20. We therefore set out our view on the aims of RPI-X@20 and outline the principles that we want the review to adhere to. We will return to these on a regular basis, to ensure that we are developing ideas that are consistent with them.

2.2. We also think it is appropriate to be clear on how we intend to undertake the review. If we need to change our objectives, principles or proposed approach we will make any changes public and explain why they have changed.

Aims of the review

2.3. RPI-X@20 aims to ensure that an effective regulatory framework for energy networks is in place that delivers choice and value for consumers, and places appropriate incentives on companies to facilitate efficient delivery of a sustainable energy sector. This is in line with the Authority's primary duty.

2.4. The more specific objectives of the review are to develop a regulatory framework that encourages licensees to:

- facilitate delivery of a sustainable energy network;
- invest appropriately in networks;
- strive for increasing efficiency, innovation and appropriate quality of service; and
- respond to the needs of current and future consumers.

2.5. Given the uncertainty that the sector faces, any regulatory framework must be sufficiently flexible to adapt to changes in the energy industry and the wider economy. We must also have regard to the need to secure that the networks are able to finance their activities subject to them operating economically and efficiently.

2.6. RPI-X@20 will be a success if our recommendations result in a regulatory framework that meets our objectives and remains fit for purpose for the long term.

Guiding principles for the review

2.7. We want to be clear from the beginning that we do not intend to implement change for change's sake. Amendments to the current regulatory regime will only be made where there are clear benefits in doing so. If substantial change is recommended we will consider carefully, in an open consultation process, the timescale over which changes should be phased in.

2.8. We have established a number of other guiding principles for RPI-X@20:

- **Consultation:** We will provide ample opportunity for interested parties to engage with us and have their views heard. We have put in place a range of mechanisms to enable this to happen (paragraph 1.31).
- **Transparency:** We will be transparent in the way we undertake this project and in how we arrive at conclusions and recommendations. Our consultative approach should facilitate this and we will place key project documents on our website.
- **No surprises:** As a result of our transparent and consultative approach, interested parties should be aware of the direction of Ofgem's thinking and the rationale underpinning the recommendations that we take to the Authority. There should therefore be no surprises at the end of the review.
- **Better Regulation:** We will seek to ensure that the process we follow and the recommendations that we present to the Authority are proportionate, consistent and targeted towards the issues in hand. We will remain accountable for the conclusions that are reached as well as the process that is followed.
- **No retrospective action:** We understand the importance of maintaining regulatory certainty and therefore are keen to make clear that RPI-X@20 will be focussed upon the framework for future regulation of energy networks. We currently envisage that any recommendations from RPI-X@20 will apply to the next transmission price control review (TPCR5). This is an area that we will keep under review as the project and our thinking develops through the consultation and proposed recommendations phase. In the event that there are any proposed changes to other sectors in the wake of the RPI-X@20 review and before the next price reviews, these will be considered in consultation. Any changes to the framework will be implemented through clear transition arrangements.
- **No stranding of efficient investment:** Where efficient investment has already been undertaken by network companies and has been included in the regulatory asset value (RAV), we will ensure that suitable funding arrangements are incorporated into any framework adopted at the end of this review. We will also consider how best to take forward the potential stranding of future efficient investment in any new regulatory framework.

Proposed approach to RPI-X@20

2.9. As announced in March 2008, and reiterated in our stakeholders workshops, we intend to undertake a detailed first principles analysis of what regulation needs to do today, and in the future, to determine whether the existing regulatory regime remains fit for purpose. We will also be considering ways in which the regulatory regime might be changed to deal with identified issues.

2.10. Throughout the review we will be mindful of the need to consider whether it is appropriate to adopt a different approach to regulation of transmission and distribution, and/or gas and electricity. We will also consider the relevance of any of our findings for independent gas and electricity networks.

Identifying ideas from a range of sources

2.11. RPI-X@20 is focused on developing a regulatory framework that meets the needs of energy consumers of the future, particularly facilitating the efficient delivery of the low carbon economy and providing value for money. We are not looking for a framework that is necessarily appropriate for other regulated sectors.

2.12. However, we will draw on relevant experiences from network regulation in other sectors and other countries, making sure that we test the applicability of specific ideas to the different energy networks. As part of this, we will monitor developments in current price reviews in other sectors and government reviews of regulated sectors more generally[15]. We have published on our website a paper on lessons from other network regulators[16] as a starting point.

2.13. We will also review the literature on network regulation and consider alternative approaches presented there. As a first step, we have published a paper on alternative price control frameworks on our website[17]. This paper looks at the economic principles underlying a range of price control frameworks including rate of return, sliding scale, and yardstick competition. We will continue to review ideas from these and other approaches. Preliminary ideas are discussed in Chapter 6.

2.14. Our in-house analysis will be supported by advice and research from regulatory experts. Our Advisory Panel will be used to generate debate on issues during the visionary phase of the project. Ideas, and peer review, will also be provided by other teams in Ofgem and by the Authority. As emphasised in the previous chapter, we also wish to engage with a range of interested parties to ensure that a broad spectrum of ideas are considered.

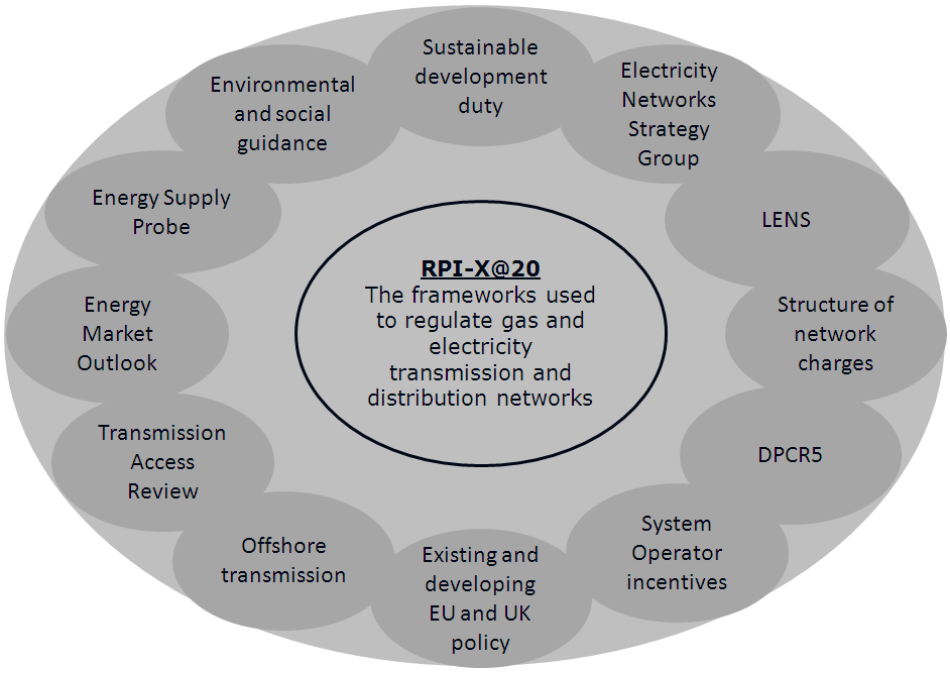
Links with relevant Ofgem projects

2.15. We will consider links between this review and other Ofgem projects. The main relevant projects are shown in Figure 3 and a summary is provided in Appendix 2.

[15] This includes: the Cave review of Innovation and Competition in the water sector; the Competition Commission Airports Market Investigation; the DFT review of airport regulation; and the New Zealand Commerce Commission review of Input Methodologies for economic regulation.
[16] Cambridge Economic Policy Associates (2009), "The Use of RPI-X by Other Network Industry Regulators - A Report for Ofgem", February
[17] Regulatory Policy Institute (2009), "Characteristics of alternative price control frameworks - A Report for Ofgem", February

2.16. We will, as discussed in more detail in Chapter 3, take account of lessons from previous energy price reviews and from the development of energy and environmental policy since privatisation. We will also review the development of competition on the networks, with independent gas and electricity network operators (IGTs and IDNOs), and any lessons for the wider regulatory framework.

Figure 3: Inter-relationship with other Ofgem projects



2.17. We will ensure that we take account of the impact of our work on Ofgem's sustainable development duties. Some of the key challenges affecting energy networks relate directly to these objectives and we will work with relevant internal teams to ensure key issues are identified and addressed. Similarly, we will take a leading role in exploring the implications of our LENS work for network regulation.

2.18. We think it is important that we have joined-up thinking in all areas of Ofgem, to enable emerging thinking on RPI-X@20 to be reflected in other projects, and to ensure that the RPI-X@20 team is familiar with developments in other areas. We have established cross-project working internally to ensure this happens effectively.

Links with EU and national policy

2.19. We recognise that energy and environmental policy are under on-going discussion at both national and EU levels. Our work in this area is outlined in Appendix 2. The RPI-X@20 team will ensure that they are familiar with policy developments and consider implications for the long-term regulatory framework.

3. Setting the scene

Chapter Summary
This chapter sets out a reminder of the original principles of RPI-X regulation; an overview of the evolution of energy network regulation since privatisation; our review of the performance of the network industries under RPI-X regulation; a description of the legacy of the existing regulatory regime; and our review of the main challenges facing energy networks.

Question 1: Are the original principles of RPI-X regulation still valid?
Question 2: Do you have any comments on our description of the context of energy regulation since privatisation? Are there any issues or events relevant to the regulation of energy networks that we have not considered?
Question 3: Do you have any comments on our description of the evolution of network regulation since privatisation?
Question 4: Do you think our description of the existing regulatory framework in electricity and gas transmission and distribution is the appropriate base case (starting point) for RPI-X@20? Is it appropriate for us to consider electricity distribution regulation using developing proposals from DPCR5?
Question 5: What lessons do you think RPI-X@20 can take from the history of energy regulation?
Question 6: Do you have any comments on our assessment of the performance of the network industries since privatisation?
Question 7: Do you think our description of energy networks and the regulatory framework today (the legacy of RPI-X) is accurate? What do you think the implications of this legacy are for RPI-X@20?
Question 8: Are the identified challenges the right ones? Are they new challenges not previously addressed? Are they short-term (temporary) or permanent challenges? Are there others that we should consider in RPI-X@20?

3.1. RPI-X@20 will assess the performance of the RPI-X regulatory frameworks that have been used to regulate Britain's energy networks for the last twenty years. We are not starting the review with a blank sheet of paper. Existing regimes are in place. In order to assess whether the existing frameworks remain fit for purpose, we need to understand:

- the detailed mechanics and processes involved in the individual price controls, and how these have evolved over time;
- the context within which the regulatory framework has evolved; and
- the performance of the networks under the price controls.

3.2. A retrospective assessment of this type will allow us to understand the issues that have arisen in the past, identify the solutions that were put in place or are currently being considered (e.g. in DPCR5 and TAR), and understand what the legacy of RPI-X regulation is for the energy networks. This will provide us with a clear starting point (base case) for RPI-X@20.

3.3. We recognise that this review is about identifying an enduring regulatory framework for the future. A historical description of regulatory trends and performance to-date is not sufficient in itself. We also need to understand what the future challenges are and consider whether the world has changed significantly relative to when RPI-X was implemented.

3.4. This chapter summarises the work we have done in this area. A number of supporting papers are available on our website that set out this work in more depth.

RPI-X: The original concept

3.5. RPI-X@20 provides an opportunity to remind ourselves of the original principles and context of RPI-X regulation and to look at the way it has been developed by regulators (including Ofgem and its predecessors) over time.

Expected benefits of RPI-X regulation

3.6. The original idea of RPI-X regulation, initially proposed for British Telecom by Professor Stephen Littlechild[18], involved limiting changes in price to general inflation less a specified 'X' factor. The intention was that the 'X' factor would reflect the expected change in productivity, over and above what was expected in the economy more widely (reflected in the RPI).

3.7. Littlechild concluded that RPI-X regulation would be preferable to four other alternatives[19] primarily because it provided the best protection against monopoly by providing strong incentives for efficiency. RPI-X regulation was also considered to involve a low burden of regulation. There was an expectation that it would involve simple processes and that setting the X-factor would be a straight-forward exercise.

3.8. Because it was expected that RPI-X regulation would only be needed until effective competition developed, Littlechild and others at the time did not discuss how the mechanism would operate in the long term. For example, there was no discussion of how the benefits of efficiency improvements would be shared with customers. There was also little discussion of long-term capital investment, with the need to ensure there was no incentive to overinvest being the main concern in response to experiences with rate of return regulation in the US at the time.

[18] Littlechild S (1983), 'Regulation of British Telecommunications' Profitability: A Report to the Secretary of State', Department of Trade and Industry: London

[19] The alternatives were a profit ceiling scheme, an output-related profits levy, a maximum rate of return and the option of no explicit constraint on profit.

RPI-X regulation in practice

3.9. Since 1984, RPI-X regulation has been applied, in a number of guises, across a range of sectors in GB. It has also been adopted and adapted by regulators in a large number of other countries. We discuss how RPI-X regulation has evolved in energy networks, and in other sectors and countries, in our supporting papers.

3.10. Our review of the practice of regulation shows that, across all sectors, the frameworks in place are adaptations of the original idea of RPI-X regulation.

- RPI-X regulation has been required for the long term, certainly for network industries. Regulators have therefore had to develop methodologies for managing changes over time and for passing on efficiency savings to customers.
- Not long after the regulatory framework was introduced concerns were raised about the quality of service provided. This has resulted in the development of methodologies for regulating service (target setting and reward-penalty regimes).
- Across the sectors, there has been an increased focus on capital investment. Regulators have tried to adapt the original RPI-X framework to incentivise efficient capital investment. There is continuing debate, in a range of sectors, on the best way of treating capital investment in the RPI-X regime.
- Regulatory reviews have become lengthy and detailed affairs. Significant resource and effort is spent designing price controls. The controls themselves have also becoming increasingly complex, to reflect the wide range of issues covered.

3.11. RPI-X regulation as applied in practice is therefore different to the original idea, although the focus on efficiency incentives has largely been retained. We will consider whether the changes made within the energy sector have created an 'RPI-X framework' that remains fit for purpose. We will also consider whether there are any lessons from the application of RPI-X regulation in other sectors.

3.12. We welcome views on whether the original idea of RPI-X regulation remains appropriate and whether there are particular lessons we should draw from the varied experience with RPI-X regulation in practice.

Energy network regulation since privatisation

3.13. We have undertaken a detailed review of how energy network regulation has evolved since privatisation. Details are provided in our supporting papers on "The context of energy regulation since privatisation" and "The History of energy network regulation". The review spans the period 1986 to 2008, allowing us to understand how the regulatory framework works now and how it has changed over time.

3.14. This is by no means a complete history of the energy sector since privatisation. We have purposefully focused on the main events and developments that were relevant for the design of the regulatory framework. A summary of the main messages from this retrospective review is provided here.

The context of energy regulation

3.15. It is clear that the design of regulatory policy, both the mechanics and the processes, is influenced by external developments in the regulated industry, in government policy and in the economy and financial markets more widely. It is important, when reviewing the evolution of price controls over time and considering the need for change, to understand how these contextual factors impact on the design of the regulatory framework.

3.16. Our review of the context of energy regulation has identified a number of important changes that have impacted on the RPI-X framework for energy networks.

- Government policy in the decade following privatisation was focused on ensuring effective competition where this was possible. This has taken time and there are ongoing changes to ensure effective competition[20].
- In recent years, ensuring delivery of a sustainable energy sector has become central to energy policy.
- All of the energy industries have undergone restructuring and ownership changes since privatisation.
- In the last twenty years, there has been little "disruptive" technical innovation. Managing network assets has historically been about predicting growth in energy demand across a network and providing required capacity accordingly. This is now changing. Measures to tackle climate change could have a profound impact on the size and shape of future energy networks. The rapid reduction in costs of smart metering and network control technology could lead to "smart networks".
- The existing networks have operated, until recently, in a largely benign economic climate with capital available from the financial markets. The networks are now operating in a period of recession and face more challenging financial markets.

3.17. A number of these factors are expected to continue to influence the shape and direction of the regulatory framework. We need to consider, in RPI-X@20, implications for the design of a long-term regulatory framework.

3.18. We would welcome any comments on the potential implications of these, and other, changes in energy policy and industry structure for future network regulation.

The evolution of energy network regulation

3.19. The starting point for this review is an understanding of how each of the energy industries is currently regulated. Our 'base case' is emerging thinking from DPCR5 and TAR, and conclusions of the most recent price reviews for distribution and

[20] See for example our 2008 Energy Supply Probe.
http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Pages/Energysupplyprobe.aspx

tranmission. Details on the current, and previous, price controls can be found in our supporting paper "History of energy network regulation".

3.20. It is clear that the details of the 'RPI-X framework' vary across the energy networks. We will need to consider whether there are lessons to be learned from one regulatory framework that can be applied to another. We will also consider whether it remains appropriate to have different frameworks in the future, or indeed whether further differentiation is warranted. Furthermore, we need to assess whether incentives are appropriately aligned along the networks and between networks, users of the networks and final customers.

3.21. Appendix 3 provides details of the timing of the electricity and gas network price controls since their implementation. The detailed methodology underlying the controls has changed from review to review. The most significant changes were implemented as part of the recent price reviews. Initiatives were put in place to further the sustainability agenda, facilitate capex efficiencies, innovation and improved service quality, as well as to reflect changes in financial aspects of the controls (e.g. pensions and cost of capital). Measures have also been introduced to reflect increased uncertainty about what networks need to deliver during a five-year price control period (resulting in more revenue drivers, re-opener arrangements and ex-post mechanisms such as the gas distribution discretionary reward scheme). Planning and regulating long-term network investments has been a challenge and arguably more work is needed in this area.

3.22. Outside of the core price control framework, we have used a number of tools to control monopoly behaviour and incentivise networks. For example, competition in networks has been developed with the introduction of independent gas and electricity networks. We have also used competitive processes, such as tendering, when considering new projects (most notably the development of the offshore transmission regime).

3.23. In RPI-X@20 we will consider whether there are any lessons to be learnt from the evolution of energy network price controls since privatisation. We would welcome views on what these lessons might be.

Performance of regulated network energy industries

3.24. We have undertaken an assessment of the performance of regulated network energy industries since they were privatised. Details of our review can be found in the supporting paper "Peformance of the energy networks under RPI-X".

3.25. The overriding conclusion of this analysis is that RPI-X has served customers well over the last couple of decades. The key points are as follows:

- Price controls have driven down the revenues that network companies are allowed earn from their network charges. Since the network companies were privatised allowed revenues have declined by approximately 60% in electricity

distribution and 30% in electricity transmission (allowing for increases in the current period driven by increased capital investment). Allowed revenue for gas transmission and distribution declined by approximately 35% between 1995 and 2002, and by a further 10% between 2002 and 2007. Allowed revenue for gas transmission and distribution has increased in the current period, reflecting the large capital investment programmes in each sector. The reductions were possible despite ongoing capital investment across the sectors since privatisation.

- There is evidence to suggest that operating efficiency has increased, for example real unit operating expenditure has fallen by approximately 5.5% p.a. across the electricity distribution networks since privatisation, and we continue to set incentives to encourage the energy network companies to improve their operating efficiency.
- Capital investment in the electricity networks is higher on average than the period immediately prior to privatisation. There has also been significant investment in the gas distribution and transmission networks, including the recent programme to replace cast iron mains.
- The allowed pre-tax return has typically sat within the range of 6-7% in price control settlements and companies have, in response to the incentive regime in place, earned higher returns by beating the regulatory contract. This has been confirmed by our recent analysis of the return on regulatory equity earned by electricity and gas distribution companies. For example, recent Ofgem analysis has estimated that actual returns across the electricity distribution networks over the current price control period may differ from the assumed norm by a variation of +3.5 to -1.5 percentage points. Applying this same technique to the gas networks has returned a variation of +6.5 to +0.5 in actual returns across the gas networks over the past year relative to the assumed rates.
- The quality of service delivered to customers has improved, with a 30% reduction in both the number and duration of reported power outages between 1990 and 2008. The number of unplanned customer interruptions in gas has also remained at a low level (less than 0.5 per 100 customers annually) since 2003. Improvements have generally arisen in response to quality of service incentives put in place alongside, or within, the RPI-X framework.

3.26. In recent years, however, we have observed changes. At the most recent price reviews, we have allowed stable (RPI+0) or increasing (RPI+X) prices. Companies continue to have incentives to reduce costs, for example through the adoption of new business models, but the scope for further large-scale reductions may be limited. Networks, including the offshore regime, are also forecasting large investment requirements going forward. For example, in TPCR4 the transmission companies forecast capital expenditure of £5.1m[21] for the period 2007 to 2012. This was a 100% increase on the previous period. The combination of increased investment, and

[21] This is capital expenditure for gas and electricity transmission, including a £560m allowance for the Transmission Investment for Renewable Generation Regime, which is ouside the price control. All figures are expressed in 2004/05 prices.

potentially reduced operating efficiency savings, could place significant upward pressure on network charges[22].

3.27. We welcome views on our assessment of the performance of regulated energy networks since privatisation and on recent changes in that performance.

Legacy of RPI-X regulation

3.28. RPI-X regulation was introduced primarily to provide incentives to improve operating efficiency. As noted above, the regulatory framework has been successful in doing this and, in doing so, has influenced the characteristics of the network companies today.

3.29. We have had discussions with a wide range of interested parties and have heard a number of statements about the characteristics of energy networks. There are clearly exceptions to the rule. However, the consensus view on today's energy network companies can be summarised as:

- tight operating cost bases, as a result of efficiency savings delivered;
- financed by a mix of equity and debt, with evidence of increased gearing;
- low risk and potentially risk averse (in their culture, and in operational, organisation and financial choices);
- willing to undertake investment only when commitment is provided by users and/or the regulator that the investment will be allowed into the regulatory asset base;
- focused on allowed revenue and less concerned about the structure of network charges that can have a significant impact on the need for network investment and on the costs faced by consumers and different groups of consumers (for example business and domestic customers);
- more focused on Ofgem, and understanding how to 'beat' the regulatory contract, rather than on understanding their own consumers' needs and being rewarded for improving customer service;
- reactive to developments in government policy (at national and EU level) rather than proactive;
- reluctance to innovate; and
- focused on their own business but not interactions with markets (upstream and downstream) or other networks.

3.30. We recognise that this is a highly stylised characterisation designed to provoke debate and does not properly reflect the attitudes and performance of the many

[22] By way of comparison, Ofwat argue that in the water industry much of the large investment programme in the 1990s was financed through the operating efficiency savings made by the companies. This helped to limit the scale of price increases (relative to what would have been required in the absence of efficiency improvement).

energy network companies that operate in Britain. However, we think it is a useful "strawman" to assess any proposals for change against to see whether they would be robust to this characterisation and would not encourage companies to behave in this way.

3.31. We welcome views on our characterisation and whether respondents agree with this characterisation and whether, if they do, they think this is a response to the existing regulatory framework and the incentives it creates.

Challenges facing the energy networks

3.32. Since privatisation, the energy networks have largely operated against a relatively predictable and stable background. However, we have found from discussions at our workshops and in wider arenas that the energy sector is now in a period of change and there is unprecedented uncertainty about the future direction and roles of networks.

3.33. We have identified a number of key challenges that the networks have faced in recent years and that they are expected to face in the future.

- The energy sector is expected to play a leading role in delivering a sustainable energy sector for the future (incorporating security of supply, environmental targets and fuel poverty targets). As discussed in Chapter 1, and later in Chapter 5, there is significant uncertainty about what this means for the future role and direction of networks.
- There is uncertainty about the precise details of current and emerging energy and environmental policy at national and EU level.
- There are questions about the level and variability of charges, and more generally concerns about whether networks are providing value for money for consumers.
- Following the credit crunch and subsequent turbulence in the financial markets, there is uncertainty about the potential impact on the financeability of the networks, and on the cost of financing significant and uncertain capital investment programmes.

3.34. The key question for RPI-X@20 is whether these challenges signal a step change in what energy networks are required to deliver and how they are expected to operate. If energy networks are changing, we need to consider whether a change in the regulatory framework remains is also merited.

3.35. We are keen to understand views from interested parties on how the different parts of the industry are already responding to these challenges and whether such responses are being hindered or supported by the existing regulatory framework.

3.36. We discuss these challenges in more detail in the next two chapters. Our themes are closely aligned with the challenges described above. Our decision to focus on these themes in the visionary period of RPI-X@20 also reflects the feedback that we have had from stakeholders.

4. Focusing on consumer needs

Chapter Summary
This chapter sets out why "focusing on consumer needs" is a priority theme for RPI-X@20; and our current views on the issues that we need to consider in relation to this theme. We do not form any conclusions or recommendations on these issues.

Question 1: We present a number of issues that we will consider when assessing the processes that we and networks use to focus on consumers. Have you any views on these issues? Are there others that we should also consider?
Question 2: We present a number of issues that we will consider when assessing how the regulatory framework encourages networks to meet the needs of consumers. Have you any views on these issues? Are there others that we should also consider?
Question 3: Are the issues different for gas and electricity, and for transmission and distribution?

4.1. Our primary duty is to protect the interests of present and future consumers, wherever appropriate by promoting effective competition. We recognise that where effective competition is not possible or appropriate, regulation is needed.

4.2. For the purpose of RPI-X@20 we interpret our primary duty to mean that we, and network companies, must ensure that services provided to consumers offer value for money, and that choice and quality of service is provided at the level required by consumers (with variation by consumer group where appropriate).

4.3. We explain here why we think this theme is a priority area for RPI-X@20. We also identify a range of issues that we think need to be considered when reviewing how we, and energy networks, focus on the needs of current and future consumers.

Why is focusing on consumer needs a priority for RPI-X@20?

4.4. There are a number of reasons why we think it is important for RPI-X@20 to deliver a regulatory framework that ensures that we and the network companies focus on the needs of current and future consumers.

- **Primary duty**: RPI-X@20 provides an opportunity to step back and consider whether the current regulatory framework continues to be the most effective means of meeting our primary duty of protecting the interests of present and future consumers.
- **Concern that network companies are not focused on final energy consumers or their customers (energy suppliers and generators)**: In our workshops we have had feedback from a range of interested parties, including network companies themselves, that the companies are not always sufficiently focused on the needs of consumers. There is a sense that the companies spend more of their time focused on Ofgem than consumers.

- **Increasing network charges**: Network charges are increasing, primarily because of large capital investment programmes. We need to place more emphasis on ensuring that networks, and the regulatory framework, provide value for money. The fuel poor and vulnerable customers are of particular concern. We also need to consider the interaction between the setting of allowed revenue and the level and structure of network charges, as it is the combination that determines efficient pricing and investment signals.
- **Balancing of different objectives:** We, and the networks, need to balance a range of objectives including limiting the scale of price increases, providing network reliability, and ensuring there is sufficient investment to facilitate delivery of security of supply, environmental targets, and social objectives. The balance between these objectives should reflect the needs of current and future consumers. There is, however, a concern that we do not currently have the information to determine the appropriate balance and there may be a case for getting more consumer involvement in the process.
- **Regulatory complexity**: We have also heard, in our workshops, concerns about the complexity of the regulatory regime and that this complexity makes it difficult for consumers and their representatives to engage on issues relating to the regulation of the networks. In recent years we have undertaken willingness to pay research to inform price reviews and we have set up a number of new consumer groups, most notably the Consumer Challenge Group, to consider the impact of the total package on consumers. In RPI-X@20 we will consider whether there are other ways in which we, and the networks, could actively engage with consumers. We will also assess the case for making elements of the regime easier to understand.

4.5. We welcome views on our rationale to prioritise the 'focus on consumer needs' theme in the visionary phase of RPI-X@20.

What issues do we need to consider?

4.6. When considering this theme we need to look at both the regulatory process and the mechanics of setting price controls. We outline here the issues that stakeholders have suggested we consider in relation to both aspects of the regulatory framework.

4.7. We will consider these issues at a general 'network' level. However, we will also ensure that any differences between distribution and transmission networks and between gas and electricity networks are identified under each issue.

4.8. We welcome views on whether these are the right issues to review when considering whether and how we and the networks focus on consumers' needs.

Focusing on consumers

4.9. In line with better regulation principles, we aim to be open and transparent in our decision-making. Proposals are consulted upon, both through the publication of written consultation documents and through open workshops with interested parties.

Consumers and their representatives, as well as users of the network, are encouraged to participate in all our consultations and stakeholder workshops.

4.10. We launched our Consumer First initiative in March 2007, with the aim of gaining better insight into consumers' needs and ensuring we have consumers at the heart of our decision making processes. As part of Consumer First we have set up a panel of 100 customers who provide feedback on key regulatory issues and help us to develop our policy proposals. We have also set up a Consumer Challenge Group of six consumer experts to work with us on DPCR5. The aim of the Group is to complement the consumer research being undertaken as part of DPCR5 by:

- enabling Ofgem to get consumer input into some of the more complex issues that we are unable to address through market research;
- providing a 'critical friend' from the consumers perspective; and
- acting as a counter-balance to industry views.

4.11. The Group meets with the Authority sub-committee with the same regularity as the DNOs to help ensure that consumer considerations are at the heart of the decision-making process.

4.12. As part of DPCR5 we are also carrying out a large programme of consumer research. This has included in-depth qualitative work with worst served customers and those who are medically dependent on network suppliers; a willingness to pay survey and qualitative work to help us understand consumer priorities. This programme of research will continue during the DPCR5 process

4.13. DNOs are also required to provide evidence that stakeholders support their draft business plans. We will review the link between the business plans and the stakeholder evidence in DPCR5. We have also been scrutinising the way in which the DNOs have carried out their stakeholder engagement and will be working with the Challenge Group to identify and spread good practice to other DNOs. Separately, we are considering in our Code Governance Review the role of code administrators, consumers and new entrants in industry code arrangements[23].

4.14. DPCR5 is the first price control review for which we have had a Consumer Challenge Group and for which we have required DNOs to undetake stakeholder engagement. We recognise that we will need to build on and develop these measures to engage with consumers going forward, and that they may need to be extended or adapted beyond DPCR5. We outline here the main related issues that stakeholders have encouraged us to consider in RPI-X@20.

[23] For more details see Ofgem, 'Code Governance Review - role of code administrators and small participant/consumer initiatives', December 2008.

- **Our engagement with consumers**: Should consumers be more directly involved with the regulatory process? If so, what is the most appropriate way for their interests to be represented? Do consumer organisations have adequate resources to increase their level of engagement in the regulatory process? How can the interests of future consumers be represented in the regulatory process?
- **Our engagement with users of the network**: The service provided to consumers reflects behaviour and decisions by all companies along the supply chain (i.e. producers/generators, transmission and distribution networks, and energy suppliers). Does this mean that users of the network should also be involved with any regulatory process intended to improve the focus on consumer needs? If energy supply companies are engaged in the regulatory process, could take have the responsibility for representing the interests of final consumers?
- **Basis for engagement**: What issues should we and the network companies engage with consumers and network users on? Should the focus be on taking a step back early in the regulatory process to understand the needs of consumers or should the focus be on policy proposals and detailed consultations or both?
- **Complexity**: Are our regulatory controls and processes too complex? Do they make it difficult for consumers to engage in consultations? Does the regulatory regime is leading to unintended consequences? Is there a need to reduce the complexity? How might we do this? What are the potential risks of doing this?
- **Network engagement with consumers and network users**: How can the regulatory regime encourage networks to engage directly with consumers and network users? Should this be something that is encouraged or should it be required? Is engagement needed on an ongoing basis or just at particular times (e.g. for business planning for a regulatory review)?
- **Legitimising the regulatory process:** Are there other ways that the regulatory process could be improved from a consumer perspective (e.g. providing consumers or defined consumer groups with a right to appeal the regulatory settlement to the Competition Commission)?

Meeting the needs of consumers

4.15. As discussed in Chapter 3, RPI-X regulation of energy networks has delivered lower prices, reliable services and increased capital investment. However, concerns have been raised, at our workshops and in other arenas, about the ability of the current regulatory framework to continue to ensure consumers get value for money and quality of service at the level they require (within reason). We summarise here the issues that we have been encouraged to assess in this area.

- **Identifying what consumers need**: How do we identify what consumers need? Is this the role of the regulatory framework or for networks to do themselves? How do we best reflect the needs of consumers in the regulatory mechanisms? How do we take account of the impact of decisions on different groups of consumers (e.g. the fuel poor, rural consumers, or future consumers)? How do we determine what is best delivered through an overall 'allowed revenue' determination and through the range and structure of charges that determine who ultimately pays?
- **Balancing objectives**: How should we balance the needs of different consumers (including future consumers)? If incentives are not aligned, how do we balance the needs of users of the network with the needs of consumers? How do we balance demands for lower prices, better quality of service/network reliability,

and delivery of a sustainable energy network? Should we or the networks be responsible for balancing these objectives?

- **Value for money**, **efficiency and innovation**: What is the best way of ensuring value for money is delivered by the networks? Are the incentives for improving operating cost efficiency sufficiently strong? Are the incentives to undertake replacement and enhancement capital investment efficiently sufficiently strong? Do we need to consider total cost efficiency? Is it important to consider efficiency over time, and if so over what time horizon? How can we encourage networks to adopt innovative solutions to provide reliable services to consumers efficiently?
- **Quality of service**: How do we, and the networks, identify what quality of service current and future consumers want and what price they are willing to pay for that service? To what extent can there be variation in the quality provided to different consumers? How do we monitor whether investment undertaken has delivered the level of quality required by consumers? How might an effective reward/penalty system be designed?
- **Volatility of charges**: Should we be concerned about increasing volatility in network charges and the knock-on impact on consumer bills? How do we trade-off the need to deal with uncertainty with a desire for price stability? Can the trade-off be managed through a change in the balance of risks between networks, suppliers and consumers? Can this be managed through the competitive retail market?
- **Structure of charges**: If we want to focus on the cost of efficiently providing energy services to consumers, should we consider the determination of the structure of charges and the allowed level of revenue simultaneously? How might this be done?
- **Alignment of incentives along the supply chain**: The service provided to consumers reflects behaviour and decisions along the supply chain. How do we ensure that incentives to provide value for money and quality of service are aligned along the supply chain?

Way forward

4.16. During the visionary phase of RPI-X@20 we will review these issues above, and any others presented to us by stakeholders, using both in-house analysis and advice from experts. We will review our own practices particularly those introduced in 2007, and consider whether they can be improved on and how they might be used more widely in the regulatory process. We will also continue to consider the practices of other regulators to see how they are encouraging regulated businesses to focus on the needs of their consumers.

4.17. Our emerging thinking on focusing on consumer needs will be published in our consultation paper in November 2009.

5. Delivering a sustainable energy sector

Chapter Summary
This chapter sets out why delivering a sustainable energy sector is a priority theme for RPI-X@20, focusing on security of supply, environmental targets and social objectives (including fuel poverty); and identifies the key issues that need to be considered. We do not form any conclusions or recommendations on these issues at this stage of the review.

Question 1: Do you have any views on our description of the sustainability challenges facing networks? Are these new challenges? Are the challenges different for electricity and gas, and for transmission and distribution?
Question 2: We present issues that we think we should consider when assessing how decisions about what needs to be done by the networks are incorporated in the regulatory regime. Have you any views on the list of issues? Are there others that we should consider?
Question 3: We present issues that we think we should consider when assessing how the regulatory framework can ensure that any capital investment is efficient and is financed. Have you any views on the list of issues? Are there others that we should consider?
Question 4: We present issues that we think we should consider when assessing how the regulatory framework balances risk and rewards. Have you any views on the list of issues? Are there others that we should consider?
Question 5: We present issues that we think we should consider when assessing how the regulatory framework can encourage innovation by the networks. Have you any views on the list of issues? Are there others that we should consider?
Question 6: Are we addressing the right issues and questions in the 'Delivering a sustainable energy sector' theme? Are there any issues missing from this theme?
Question 7: Are there issues that need to be covered in RPI-X@20 that are not adequately captured by our two themes? Please specify what these issues are.

5.1. For the purposes of RPI-X@20, we define a sustainable energy sector as one which promotes security of supply over time; delivers a low carbon economy and associated environmental targets; and delivers related social objectives (e.g. fuel poverty targets).

5.2. The delivery of a sustainable energy sector involves all parties along the supply chain in both the gas and electricity industries. The networks ultimately have a facilitating role, ensuring assets and operations adapt to changing demands (both upstream and downstream). They also undertake specific environment-driven projects (e.g. undergrounding of lines) and work to reduce their own carbon

footprint, including limiting losses from the network. In addition, networks undertake specific projects to help the fuel poor[24].

5.3. As discussed earlier in this paper, the level of uncertainty about the future role and direction of energy networks in delivering a sustainable energy sector is unprecedented. It is therefore important to consider whether the RPI-X framework remains fit for purpose in the face of this uncertainty.

5.4. Going forward, delivery of a sustainable energy sector may require increased interaction between networks and other parts of the supply chain. The 'holistic' approach may involve changes in the role of the networks. We will consider, in RPI-X@20, how such interactions might be encouraged in the regulatory framework.

5.5. In this chapter we explain why this theme is a priority for RPI-X@20. We then set out our thoughts on what issues we need to review in relation to this theme.

Why is delivering a sustainable energy sector a priority for RPI-X@20?

5.6. We have heard at our industry workshops and in other arenas that the energy networks need to respond actively to the challenge of delivering a sustainable energy sector. This may require changes in current operations and business culture, and may result in the direction and roles of energy networks changing. Capital investment may also increase. Stakeholders have encouraged us to consider whether this means that the current regulatory framework also needs to change.

5.7. We consider here what role the networks play in relation to each aspect of sustainability and we describe the challenges that they may face. We discuss the challenges in general terms and identify where they may be different for gas and electricity, and for transmission and distribution.

5.8. We recognise that one of the key challenges is balancing security of supply, environmental targets and social policy objectives. As noted in Chapter 4, there is also the challenge of balancing the delivery of these sustainability objectives with the need to provide consumers with services that offer value for money. The need to balance a range of objectives will be considered in RPI-X@20.

[24] For example, GDNs are incentivised to extend the gas network to specified deprived areas, with capital expenditure that is not recovered through discounted connection charges included in the RAV at the next price review.

Security of supply

5.9. In the last twenty years, there has been little technical innovation that has challenged the way that energy networks plan, invest and operate their networks. Forecasting future network requirements was primarily about forecasting future energy demand growth (driven largely by economic growth) and understanding where supply was coming onto the system. The location of generation was largely fixed and even if demand forecasts proved to be too optimistic, demand could be expected to grow over the life of the assets so that they were rarely stranded.

5.10. However, this is changing. Our work on LENS demonstrates that there is a wide range of plausible scenarios for generation, demand and, hence, electricity network design by 2050. There is some uncertainty about when and where new generation will connect, particularly in the medium to long term. There is also uncertainty about how capacity requirements will need to change for renewable energy. At the other end of the supply chain, there is uncertainty about how demand will change in the future, particularly with targets for energy efficiency, zero carbon households and commercial buildings, and installation of smart meters.

5.11. There is also uncertainty about gas networks. Demand for gas may reduce in the long term on the back of a switch to low carbon electricity. The source of gas may also change, with a mix of gas coming from imports, biogas, LNG plant, storage facilities and offshore fields. The change in the nature and location of wholesale gas will have implications for the capacity requirements of the gas transmission network. Changes in gas demand will have implications for distribution and transmission.

5.12. Historically, networks were able to ensure that capacity was available to deliver available supply to consumers. However, the scale and uncertainty of future changes in generation and demand has implications for capacity planning (both maintenance of existing assets, and the need to expand networks). There are also implications for decisions about how to operate the network assets. Understanding the implications of these network changes for security of supply is a priority for RPI-X@20.

Environmental targets

5.13. The energy sector has a central role to play in ensuring that the UK meets core environmental targets, particularly those relating to climate change and delivery of a low carbon economy. We need to ensure that the regulatory framework enables the networks to play their role in meeting these targets.

5.14. The challenge for the networks is to ensure that capacity, and operational capability, is able to facilitate delivery of the low carbon economy. This involves adapting to changes in generation and in demand. Demand may increase on the one hand because of the electrification of key parts of the economy (e.g. heating and transport) but may also decrease because of energy efficiency improvements.

5.15. The role of the networks may also need to change. For example, distribution companies may need to take responsibility for coordination requirements of electric

vehicles. The roles of the System Operator and the networks (both transmission and distribution) may also need to change. For example, smart grids and active distribution network may change the role of the network businesses, providing the opportunity to delivery more energy using less network assets.

5.16. Related to this requirement to facilitate delivery of environmental targets, we have provided networks with specific incentives to undertake projects and activities aimed at improving or enhancing the environment. These include the following:

- price control incentives for reducing transmission and distribution losses and gas shrinkage (across the networks);
- incentives for distributed generation (DG) and Registered Power Zones (RPZ) in electricity distribution;
- Sulphur hexafluoride (SF6) incentives for electricity transmission;
- an allowance for the undergrounding of lines where appropriate; and
- the innovation funding initiative.

5.17. Details on these incentives can be found in the supporting paper "History of energy network regulation" on our website. There are also proposals being considered to extend the role of the networks to wider environmental projects. For example, in the Heat and Energy Saving Strategy Consultation[25], DECC is considering whether to finance domestic energy efficiency and micro generation investment through the networks' RAV.

5.18. It is expected that networks will continue to undertake activities of this type, potentially on an increased scale, and that they will also have to work to reduce their own carbon footprint. This has immediate implications for investment requirements and the resulting impact on consumer bills.

5.19. The scale of the environmental challenge, both in terms of ambition and cost to consumers, suggests that there is a need to look for innovative solutions. It is uncertain at present what the efficient means of delivering the objectives is and what the implications for asset stranding might be. Unlike much of the last twenty years, network technologies are developing in a way that may profoundly impact the shape and size of future energy networks. Networks may be able to adopt and adapt existing and new technologies, such as smart metering and network control technology. There may also be opportunities to develop new processes and standards (for example, increasing the voltage on distribution networks). Changes in organisational culture may also be needed.

[25] The Department of Energy and Climate Change (DECC) and Department for Communities and Local Government (CLG), "Heat and Energy Saving Strategy - Consultation", February 2009, http://hes.decc.gov.uk/

5.20. Discussions at our workshops indicated that networks should actively respond to the environmental challenge but there is a lack of clarity about what precisely needs to be done. This is true in the medium (to 2020) and long term (to 2050), and relates to the need to make sure that networks respond to changing use of the network, and changes to the roles of the networks themselves. We have also heard concerns that the regulatory networks are not well placed to respond to the innovation challenge. In light of this, we have made understanding the network regulation implications of the environmental targets a priority for RPI-X@20.

Social objectives

5.21. The energy sector delivers a range of social policy objectives, for example to meet fuel poverty targets and protect vulnerable customers. Currently, social obligations generally rest with energy supply companies but there are also obligations on the networks. These can be broadly categorised into three types:

- **Licence conditions**: electricity and gas networks are required to have a Priority Services Register of customers who are of pensionable age, disabled or chronically sick and medically dependent on electricity or have special communications needs etc. They must share these customer details with suppliers. For these consumers, the networks have certain requirements including operating a password scheme for accessing premises, providing information regarding interruptions to supplies, providing facilities to enable customers with special communications needs to access information and repositioning meters (under certain circumstances).
- **Guaranteed Standards of Performance**: these are set out in Regulations and specify service levels that must be met by each operator. If the company fails to meet the level of service required, it must make a payment to the customer subject to certain exemptions. In electricity, they cover 12 key service areas, including supply restoration, connections, and voltage quality. In gas, they cover similar key service areas, including supply restoration, connections, providing alternative heating and cooking facilities during prolonged outages.
- **Discretionary reward schemes**: in the gas and electricity distribution price control reviews we have introduced discretionary reward schemes to recognise and reward companies that demonstrate best practice for consumers in areas that cannot be easily measured or incentivised through the standard RPI-X regime. These areas generaly relate to social objectives. The scheme has been running since 2005 in electricity and since 2008 in gas.

5.22. In our workshops, and in wider arenas, there have been discussions about whether networks could and should play more of a role in meeting social policy objectives, including meeting fuel poverty targets[26] and potentially wider goals (e.g.

[26] The Government published its fuel poverty strategy in 2001. The aim is to eradicate fuel poverty in the UK in two steps: by 2010 for vulnerable consumers (elderly or disabled users) and by 2018 for all consumers in the UK. Friends of the Earth, Age Concern and others recently launched a judicial review

regional regeneration). This may become more important in the future, particularly if network charges rise. We have also been encouraged to consider, more generally, the distributional impact of any potential changes in network regulation.

What issues do we need to consider?

5.23. Historically, decisions about maintaining and enhancing the network assets were based on a review of asset reliability and an assessment of expected changes in average and total supply and demand. Networks were able to make reasonable predictions about what load and non-load investment was needed, and they had a clear idea of what needed to be built and when. Essentially, they were in a 'business as usual' world.

5.24. The networks are no longer operating in a static world. They face an environment in the future with increased uncertainty about demands at different points on the network, at different points in time, and from users with different characteristics. The uncertainty raises questions about whether networks need to change the way that they make decisions about investment planning, operations of the network and their interactions with other parts of the supply chain. There are then associated questions about whether RPI-X regulation will continue to be relevant and effective in this dynamic and uncertain world. We will focus on these questions in RPI-X@20.

5.25. We present here a range of issues that we will review in relation to the role of the networks in the delivery of a sustainable energy sector. We will consider these issues at a general 'network' level, but will also take account of any differences between distribution and transmission, and between gas and electricity networks.

Identifying what needs to be done

5.26. Discussions at our workshops, and in wider arenas, suggest that networks are facing a period of change and are unclear about the requirements for investment and operations. This raises questions about whether the regulatory framework should focus more on identifying what needs to be done by the networks.

5.27. We summarise here a number of the related issues that have arisen in our workshop discussions that we propose looking at in the visionary phase of RPI-X@20.

- **A new challenge**: Does delivery of a sustainable energy sector fundamentally change the way that networks need to make investment and operating choices?

against the government, arguing that they had failed to perform their duties under the Warm Homes and Energy Conservation Act (2000), by not doing what was reasonably practicable to achieve their target because of budgetary constraints. The Court dismissed the case in October 2008.

What challenges do they face making these decisions and are these challenges new? Does this mean that the regulatory processes for considering operation, maintenance, replacement and enhancement of the networks need to change?

- **Proactive networks**: Should networks become more proactive when considering their role in delivering a sustainable energy sector? Should they make strategic decisions about their role? Should this be encouraged/incentivised by the regulatory framework or is a formal requirement needed?
- **Role of networks**: Will the role of the networks need to change? For example, would it be appropriate for distribution companies to become distribution system operators? Should the transmission system operator take responsibility for long-term strategic planning? Should distribution companies take more responsibility for meeting fuel poverty targets and wider social objectives (e.g. regional regeneration)? Should changes in the role of networks be determined by the market or should they be required by us or government?
- **Degree of regulatory intervention**: Should it be left up to the networks to determine what they need to do to deliver a sustainable energy sector? Does there need to be a clearer link between environmental targets and network business planning? Do networks require specific guidance outlining what they need to do? If detailed guidance was to be provided, should it come from us or the government or another party (e.g. a joint working group)?
- **Investment requirements**: How do the networks determine an efficient balance between making better use of the existing network and investing to enhance or expand the network? Where enhancement is needed, how do the networks decide what needs to be built and when? How should the balance between security of supply, environmental targets, and the social agenda be determined? How should the balance between prices and delivery of these sustainability goals be balanced?
- **Keeping options open**: We know, from LENS, that a range of plausible network scenarios may emerge in the future. There is value to avoiding long-term commitments to significant new assets and to experimenting and piloting trials of new technologies. How do we ensure that decisions made today do not close off options for the future? Can the option value of decisions be explicitly factored into investment planning by the networks? Can option values be considered within the regulatory framework? How should the costs of experimenting and associated risks of non-delivery be treated in the regulatory framework?
- **Interactions along the supply chain**: do the networks need to interact with other parties along the supply chain when making decisions about investment to facilitate delivery of a sustainable energy sector? How might that interaction happen? Are incentives of regulated networks sufficiently aligned? Is there a need to change property rights along the supply chain? What role might contracts play in any interactions along the supply chain? What are the implications for the regulatory framework if there is increased interaction along the supply chain?

Ensuring capital investment is efficient

5.28. Discussions in our workshops have confirmed the view that where investment is required it should be undertaken efficiently. We summarise the main issues raised, each of which we intend to review in RPI-X@20.

- **Comparison with other investments**: Is there something different about environment-related capital investment that means it would need to be treated in

a different way to other capital investment that networks undertake? How might the regulatory framework need to consider trade-offs between different investment types, and how might it consider cases where one capital project can deliver multiple objectives?

- **Investment plans**: how do networks determine what investment is needed? Should they look at a five-year period or a longer period (how long)? Is it appropriate to focus on aggregate investment decisions or to review decisions on a project-by-project basis? How do we determine whether the right level and type of investment is being undertaken at the right time? How do we balance concerns about underinvestment with concerns about overinvestment?
- **Anticipatory investment**: would it be appropriate to encourage networks to undertake anticipatory or strategic investment (i.e. before they are certain about user requirements)? How might this type of investment be encouraged? What issues would need to be addressed when considering the potential risks and the required return? How would stranded assets be treated?
- **Monitoring efficiency**: how can the efficiency of a decision to invest, or not, be tested, either ex-ante or ex-post? Is it appropriate for the regulatory framework to focus on the efficiency of a decision or on the efficiency of the costs and/or outputs delivered? Are the considerations different for different types of investment? Should we consider capital efficiencies in isolation or would a focus on total cost efficiency be more appropriate?
- **Dynamic considerations and uncertainty**: given the long-term nature of assets, and the potential for there to be step-changes in the design of networks, how can the efficiency of investment over time be considered? Is a five-year regulatory period appropriate for encouraging long-term or dynamic efficiency? What measures should be put in place to deal with the uncertainty relating to use of network, both upstream and downstream?
- **Delivery of investment**: should investment that is needed be delivered by the networks or should contracting out be used? Should there be a requirement for contracting out or is it best left to the discretion of the networks?
- **Funding network investment**: Delivery of a sustainable energy sector may require continuing subsidies for new technologies or in the absence of an effective carbon price signal from emissions trading. Should government contribute to the costs directly or should it all be paid for through consumer bills? How should costs be shared across different types of consumers (e.g. domestic and commercial, fuel poor and others, current and future)?

Balance of risks and rewards

5.29. We have heard from a number of stakeholders that facilitating the delivery of a sustainable energy sector will increase the risks that networks face. The nature and degree of risks may change over time. Furthermore, we have been encouraged to consider whether the balance of risks between consumers and networks needs to be reconsidered. We summarise here the main issues which we have heard in this area and which we intend to review in RPI-X@20.

- **Nature and scale of risk**: do the networks face more risk because of the sustainability agenda? What is the nature and scale of the risk, and how might it develop in the medium and long term?
- **Risk and return**: who is best placed to bear each type of risk? How can the regulatory framework ensure that there is a balance between the risk that

networks face and the allowed return? Should the risk-return balance vary by type of investment or even specific projects? How should the short-term and long-term financeability of individual networks be assessed? To what extent should the current crisis in financial markets affect our assessment of the treatment of risk and return in a long-term regulatory framework?

- **Risk management**: what opportunities are available to the networks themselves to manage or reduce these risks? Should the regulatory framework specifically encourage or require risk management of this type?
- **Risk sharing**: what is the current balance of risk between networks and network users, and between networks and consumers? Will this balance need to change in the future? What mechanisms might be used for sharing the risks?

Innovation

5.30. In a number of our discussions with interested parties, we heard that, if value for money is to be achieved for consumers, innovation is needed to identify the most effective and efficient means of meeting the challenges arising from the uncertain sustainability agenda. Furthermore, a number of parties argued that today's regulated monopoly networks were unlikely to innovate.

5.31. We have been encouraged to consider whether innovation can be facilitated through the regulatory framework. The issues that we will consider include:

- **Case for innovation**: are the requirements on networks changing sufficiently, for greater innovation to be needed? In what areas is innovation most likely to be required? Is it for the regulated networks, or a wider market, to identify opportunities for innovation?
- **Scope for innovation**: are there existing technologies and alternative operating processes available that could be adopted and adapted by the energy networks? Is innovation needed in the development of materials; the construction of assets; operational processes; the development of interlinkages between networks; or in the culture and organisation of network companies?
- **Barriers to innovation**: what stops networks innovating now, in particular are there barriers arising from the regulatory framework or are the costs of adopting new technologies prohibitive?
- **Encouraging innovation**: how, if at all, should the regulatory framework encourage innovation?

Way forward

5.32. During the visionary phase of RPI-X@20, we will consider whether the current regulatory framework encourages networks to facilitate delivery of a sustainable energy sector. We will review the issues using both in-house analysis and advice from experts. We will consider lessons from other regulated network industries that have had large investment programmes and that have faced periods of uncertainty. We also hope to set up working groups looking specifically at these issues.

5.33. Our emerging thinking on delivering a sustainable energy network will be published in our consultation paper in November 2009.

6. Ideas for further exploration

Chapter Summary
This chapter sets out a number of ideas presented to us by interested parties on how the current RPI-X regulatory framework might be changed for the future. We have not formed any view on the merits of these alternatives.

Question 1: We have presented a number of ideas on changes that could be made to the existing regulatory framework. Are there other alternative frameworks that you think RPI-X@20 should look at?
Question 2: Do you have any provisional views on any of the ideas presented here?

6.1. During the visionary phase of RPI-X@20 we are open to a wide range of ideas for the future of energy regulation. These could range from minor reforms to the existing regime to an overhaul of the role of regulation. We will seek to understand lessons from other sectors and countries, and from the literature. We will not formulate detailed proposals on options until the exact issues that need to be resolved have been pinned down. We will do this in the second phase of the project.

6.2. We present here a range of ideas on alternative regulatory frameworks. These ideas have been discussed in our stakeholder workshops, by our advisory panel, by academics and by other regulatory experts (e.g. consultancies). They also reflect our own preliminary research on lessons from other sectors and from the literature on economic regulation. The ideas span a spectrum, from making no changes to the existing regulatory framework to replacing the framework completely.

6.3. We have not yet formed any opinion on the merits of these options. We also recognise that the options are not mutually exclusive and that the list of ideas is not exhaustive. Furthermore, one idea may be appropriate for one industry (e.g., electricity transmission) but not for others.

Tidying up the existing regulatory framework

6.4. The main view in our two industry workshops appeared to be that RPI-X was "not necessarily broken" but that there was a need to make changes to it, particularly to ensure that investment required for delivering a sustainable energy sector was undertaken efficiently. Consistent with this view, we have heard ideas from a range of interested parties on ways in which the regulatory framework might be tidied up or adapted. Ideas that fall into this category are essentially about doing what we do now better, rather than changing what we do or how we do it.

6.5. Ideas we have heard on tidying up the existing regulatory framework relate to the need to: provide clarification on the role of the networks in delivering a sustainable energy sector; ensure that capital investment is undertaken efficiently; retain and strengthen incentives for cost efficiency; reassess the methodology for ensuring efficient networks are financeable; and align incentives across the energy supply chain (where necessary).

6.6. Many of these ideas have been developed, to some extent, in recent or current price reviews. We recognise that it is important to consider whether existing mechanisms are effective and whether they should be adjusted or extended to other areas. It will also be important to consider whether schemes that have been successful in one industry can be applied in other industries.

- **Role of networks in meeting consumers' needs and the sustainability challenge**: a mix of ideas has been proposed on whether and how to provide clarity, within the current regulatory framework, on what networks need to do to meet consumers' needs and to deliver a sustainable energy sector. These include: giving networks more freedom to develop strategic plans for meeting consumers' needs and sustainability objectives; encouraging networks to consider how to make the best use of existing assets, rather than assuming investment to expand or enhance the networks is needed; encouraging networks to invest ahead of committed demand; reassessing the balance of risks and reward for companies with respect to investment; providing guidance on outputs that need to be delivered; collecting and making better use of information on what consumers need; and, providing networks with additional or different requirements to meet fuel poverty targets.
- **Efficient capital investment**: a number of changes have been suggested to the regulatory process, and the calculation of the price control, to promote the efficient undertaking of required capital investment. These include: where appropriate enhancing incentives to undertake investment early; increasing the focus on outputs, alongside our review of costs (both ex ante and ex post); treating base investment and enhancement investment in different ways, for example by having different rates of return or requiring contracting out of enhancement investment; and, encouraging networks to consider the option value of investment decisions.
- **Efficiency and innovation**: we have been encouraged to maintain the incentive-based principle of RPI-X regulation but to review whether incentives can be strengthened or better targeted within the existing framework. Ideas falling into this category include: providing a higher reward for making efficiency savings; balancing operating and capital cost incentives; extending the price control period; explicitly considering the relationship between incentives, returns and performance; providing explicit incentives to encourage networks to manage their own risks and uncertainty; and introducing additional rewards or prizes to encourage innovation.
- **Financeability**: financeability of networks has been a central issue at price reviews in recent years, and current turbulence in the financial markets and wider economy has raised questions about how we should approach this going forward. A number of ideas for 'tidying-up' have been suggested, including: considering the relationship between risks under the regulatory package and the allowed return more explicitly; changing the way that risks are shared between networks, network users and consumers and adjusting the price control mechanisms accordingly; re-examining depreciation profiles and depreciation charging methodologies; reviewing the role and nature of financeability tests; indexing (part of) the allowed return; using "triggers"; and, locking in the allowed return for particular investments.
- **Aligning incentives along the supply chain**: as discussed earlier in the paper, delivery of a sustainable energy sector may require further interactions and integrated decision-making between different parts of the supply chain. This

could be done within the existing regulatory framework if: incentives are aligned across transmission and distribution and between network assets owner and the system operators; incentives are aligned between networks, users of the network and consumers; and, there is consistency across the regulatory frameworks for electricity and gas, and transmission and distribution, where this is appropriate.

6.7. Clearly these ideas are not mutually exclusive and, depending on how they are designed in practice, some of the ideas could involve significant changes to the current framework. We welcome views on what options we might consider if we decide that 'tidying up' the current regulatory framework is required. As noted earlier, tidying up may be the only change needed or it may be carried out alongside other changes.

Add-ons to the existing regulatory framework

6.8. A number of interested parties have suggested that the RPI-X regulatory framework could be retained, but that additional features could be added to enhance its effectiveness. These ideas are not mutually exclusive and include:

- **Consumer participation**[27]: it has been suggested that we, and networks, would be better placed to focus on consumers' needs and deliver a sustainable energy sector if there is increased participation of consumers, and network users, in regulatory decision-making. This could be done, for example, through a constructive engagement process similar to that used by the Civil Aviation Authority for airports. This may be an extension of processes being developed for DPCR5 and SO Incentives, and being considered in our Code Governance Review. The regulatory process may also benefit if consumers have a right to appeal any proposed settlement.
- **Guiding mind**: in other sectors, the economic regulator and the regulated business is provided with guidance on what the policy objectives are and, in some cases, what needs to be done to deliver them. For example, in rail as a formal stage in the price control process, the Secretaries of State specify the high level outputs required (e.g. requirements on punctuality/delays, network capacity and safety outputs). In the water sector, a joint quadripartite (made up of DEFRA, EA, DWI and Ofwat) agree what water companies need to do to deliver government environment targets. It has been suggested that a similar 'guiding mind' would be valuable for energy networks, providing clear guidance on what should be done to facilitate delivery of security of supply, environmental and fuel poverty targets. There is a fundamental question as to whether guidance of this type should be provided or whether these decisions should rest with the market. If a guiding mind is considered appropriate, there is a question about whether it

[27] Further details on how user participation might be increased in the case of electricity transmission will be discussed shortly in a paper on our website by Prof Stephen Littlechild and Cornwall Associates, " Potential scope for user participation in Ofgem price control reviews with particular reference to the next Transmission Price Control Review: A report for Ofgem".

should be government, Ofgem, a joint industry group, National Grid (as system operator), a joint working group representing all these parties, or an independent organisation.

- **Output monitoring**: in our industry workshops there were a number of discussions about whether it would be preferable to regulate capital investment by focusing on outputs rather than expenditure. There was general acceptance that there should be more of a focus on outputs, to assess ex-ante investment plans and to monitor performance during and across price review periods. The main constraint appeared to be availability of clear output measures. A number of issues need to be considered here, including specifying outputs that impact on consumers, security of supply, environmental targets and fuel poverty targets and considering how the timing of output delivery fits in with five-year regulatory cycles.
- **Changing the role of the networks and the system operator**: as noted earlier, delivery of a sustainable energy sector will require changes along the energy supply chain. Both the networks and the system operator (SO) in gas and electricity will have key roles to play. We have heard a number of questions about whether the precise roles of the transmission owner (TO) and SO will be appropriate going forward and suggestions that the roles and responsibilities might need to be revisited. A review of the alignment of incentives between the TO and SO will be central to an assessment of their roles. It has also been suggested that we should consider whether a separate system operator may be needed on distribution networks.
- **Tendering**: we are currently developing tendering proposals for the offshore transmission regime (details are provided in Appendix 2). It has been suggested that tendering of this type could be used more widely. A number of issues need to be considered here including: who specifies what should and should not be put out to tender, who designs and runs the tender process, who can participate in the tender (e.g. is the incumbent network eligible) and what would the tender be for (build-only or build-own-operate). We may also need to consider whether the networks' current procurement practices are efficient and whether more formal requirements for contracting-out are needed.
- **Franchising all or part of network operations**: it may be possible to franchise the right to operate particular parts of a network or the right to undertake particular activities (e.g. a new distribution system operator role). The design of franchising or concession arrangements would involve a number of key decisions including: who decides what is franchised; how long is the franchise for; what are the criteria for awarding the franchise; is the franchisee subject to a regulatory control and, if so, is it the same as the current regulatory framework?
- **Capacity Auctions**: Making more use of auction mechanisms in the regulatory framework has been suggested. This is another way of ensuring the needs of network users are clearly signalled and met. The idea would be to use auctions to enable network users to bid for rights to capacity, potentially at different locations and different points in time. For example it may be possible to develop 'gas-style' capacity auctions in electricity, including potentially at the distribution level. With auctions, users provide a commitment through financial transactions, and networks potentially have better information about future use of the networks. A number of issues need to be considered including the appropriate design of the auction process and mechanism, consideration of how new network users would have access to capacity, and balancing between auction bids and real time demand and supply.

6.9. Many of these ideas could be applied as add-ons to the existing framework or could be developed as stand-alone frameworks. For example, output monitoring could be incorporated into the current process of assessing capital investment programmes (as we are doing in DPCR5) or the framework could be changed to be focused on outputs rather than costs. The 'add-ons' might be considered on their own or alongside other changes to the regulatory framework. At this stage, we remain open to all options.

Alternatives to the RPI-X regulatory framework

6.10. Some interested parties have suggested that the magnitude of the sustainability challenge means that the RPI-X framework is no longer fit for purpose and that a different regime will be needed. When reviewing these ideas we would be mindful of the need to consider the timescale over which they might be relevant. The alternative ideas presented to us include:

- **Deregulation**: there may be benefits from promoting competition for energy services, and allowing the threat of fringe competition to restrict monopoly behaviour of the (distribution) networks - this could be an extension of current arrangements for competition in the wires (with IGTs and IDNOs) or a more fundamental change similar to deregulation in fixed line telecoms[28]. The idea may build on proposals in the recent Heat and Energy Saving strategy; and
- **Ex-post regulation**: moving to a system of ex-post regulation, with the focus on assessing the efficiency of decisions, ensuring outputs are delivered and checking consistency of behaviour with competition, environmental and social legislation.

6.11. To ensure we are comprehensive, we will also consider whether there is merit in changing the type of price control mechanism that is in place. For example, we will review the case for introducing a rate of return mechanism or a yardstick mechanism[29]. These options have been considered in the past and we will make use of these assessments to consider the merits of these alternative options.

6.12. While presented here as alternatives to the RPI-X framework, we note that these ideas could be considered alongside the current framework or an adapted form of RPI-X regulation. For example, energy service competition could be promoted on a trial basis in specific areas, with some form of RPI-X regulation being retained.

[28] A forthcoming paper on this idea will be published on our website shortly: M Pollitt, "Does Electricity (and Heat) Network Regulation have anything to learn from Fixed Line Telecoms Regulation?"
[29] The properties of alternative price control mechanisms are discussed in the Regulatory Policy Institute's paper on our website (http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx).

7. Next steps

Chapter Summary

This chapter sets out our proposed next steps for RPI-X@20.

Question 1: Do you have any views on the proposed next steps for the review?

Response to this consultation

7.1. This is the first consultation of RPI-X@20. We recognise that there are a wide range of issues to consider and we have therefore allowed an eight week consultation period. We hope to receive responses to this consultation from a range of interested parties. These responses will be used to inform our developing thinking in RPI-X@20. Unless marked otherwise, responses will be placed on our website. We will also provide a summary of the responses received on our website.

Future consultations

7.2. Our next formal consultation on RPI-X@20 will be our 'Emerging Thinking' paper, to be published in November 2009. It is intended that this paper will set out the high-level regulatory models that we believe have most potential for each of the four regulated energy sectors. Subject to the consultation responses, we will then work up these models in more detail.

7.3. We will present our recommendations to the Authority in summer 2010. Prior to this we will publish a consultation on our proposed recommendations, in late spring 2010. Final proposals from the Authority will be published in a decision document in autumn 2010. This will include views on any transition arrangements for TPCR5.

Ongoing engagement

7.4. We have already received valuable input to the review from a range of interested parties. We hope to continue to engage with stakeholders throughout RPI-X@20. We will do this using our Web Forum, working groups, workshops and seminars, as well as formal consultation documents. We will hold our next workshop in London on April 6th 2009. Details will be provided on our website.

7.5. Details on how to participate in a working group will be published on our website. We will also publish working papers on our website. These papers may come from the working groups, consultants and academics, or internal workstreams. Our advisory panel will continue to meet on a regular basis during 2009, providing valuable input from a range of stakeholders.

7.6. We welcome views on our proposed next steps for RPI-X@20.

Appendices

Index

Supporting papers[30]

- Ofgem (2009), "Regulating energy networks for the future: RPI-X@20 - Context of Energy Regulation since privatisation", February
- Ofgem (2009), "Regulating energy networks for the future: RPI-X@20 - History of energy network regulation", February
- Ofgem (2009), "Regulating energy networks for the future: RPI-X@20 - Performance of energy networks under RPI-X", February
- Cambridge Economic Policy Associates (2009), "The Use of RPI-X by Other Network Industry Regulators - A Report for Ofgem", February
- Regulatory Policy Institute (2009), "Characteristics of alternative price control frameworks - A Report for Ofgem", February

[30] http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx

Appendix 1 - Consultation response and questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.2. Responses should be received by Friday April 24th 2009 and should be sent to:

RPI-X@20 consultation - Networks
Ofgem
2nd floor
9 Millbank
London
SW1P 3GE
Email: RPI-X20@ofgem.gov.uk

1.3. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on our website www.ofgem.gov.uk. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.4. Respondents may request that their response is kept confidential. Respondents who wish for their responses to remain confidential should clearly mark them to this effect and include the reasons for confidentiality. Confidentiality disclaimers within emails will not be taken to represent a request for confidentiality with respect to the response itself. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. We will publish a summary of responses on the website and we will consider comments received during the course of RPI-X@20. Any questions on this document should, in the first instance, be directed to:

Cloda Jenkins, Head of Regulatory Review (Networks)
Ofgem
2nd floor
9 Millbank
London
SW1P 3GE
Email:cloda.jenkins@ofgem.gov.uk

CHAPTER: One

Question 1: Do you have any comments on the rationale for the review?
Question 2: Do you agree with the proposed scope of the review?
Question 3: Do you think the proposed themes for RPI-X@20 are appropriate?
Question 4: Do you have any views on our proposed approach for engaging with stakeholders?
Question 5: Do you have any comments on the timetable for the review?

CHAPTER: Two

Question 1: Do you have any views on our aims for RPI-X@20?
Question 2: Do you think the principles for undertaking the review are appropriate and sufficient?
Question 3: Do you have any views on our proposed approach to the review?
Question 4: Do you have any comments on the inter-relationships between RPI-X@20, other Ofgem projects and EU and national policy developments?

CHAPTER: Three

Question 1: Are the original principles of RPI-X regulation still valid?
Question 2: Do you have any comments on our description of the context of energy regulation since privatisation? Are there any issues or events relevant to the regulation of energy networks that we have not considered?
Question 3: Do you have any comments on our description of the evolution of network regulation since privatisation?
Question 4: Do you think our description of the existing regulatory framework in electricity and gas transmission and distribution is the appropriate base case (starting point) for RPI-X@20? Is it appropriate for us to consider electricity distribution regulation using developing proposals from DPCR5?
Question 5: What lessons do you think RPI-X@20 can take from the history of energy regulation?
Question 6: Do you have any comments on our assessment of the performance of the network industries since privatisation?
Question 7: Do you think our description of energy networks and the regulatory framework today (the legacy of RPI-X) is accurate? What do you think the implications of this legacy are for RPI-X@20?
Question 8: Are the identified challenges the right ones? Are they new challenges not previously addressed? Are they short-term (temporary) or permanent challenges? Are there others that we should consider in RPI-X@20?

CHAPTER: Four

Question 1: We present a number of issues that we will consider when assessing the processes that we and networks use to focus on consumers. Have you any views on these issues? Are there others that we should also consider?
Question 2: We present a number of issues that we will consider when assessing how the regulatory framework encourages networks to meet the needs of consumers. Have you any views on these issues? Are there others that we should also consider?
Question 3: Are the issues different for gas and electricity, and for transmission and distribution?

CHAPTER: Five

Question 1: Do you have any views on our description of the sustainability challenges facing networks? Are these new challenges? Are the challenges different for electricity and gas, and for transmission and distribution?
Question 2: We present issues that we think we should consider when assessing how decisions about what needs to be done by the networks are incorporated in the regulatory regime. Have you any views on the list of issues? Are there others that we should consider?
Question 3: We present issues that we think we should consider when assessing how the regulatory framework can ensure that any capital investment is efficient and is financed. Have you any views on the list of issues? Are there others that we should consider?
Question 4: We present issues that we think we should consider when assessing how the regulatory framework balances risk and rewards. Have you any views on the list of issues? Are there others that we should consider?
Question 5: We present issues that we think we should consider when assessing how the regulatory framework can encourage innovation by the networks. Have you any views on the list of issues? Are there others that we should consider?
Question 6: Are we addressing the right issues and questions in the 'Delivering a sustainable energy sector' theme? Are there any issues missing from this theme?
Question 7: Are there issues that need to be covered in RPI-X@20 that are not adequately captured by our two themes? Please specify what these issues are.

CHAPTER: Six

Question 1: We have presented a number of ideas on changes that could be made to the existing regulatory framework. Are there other alternative frameworks that you think RPI-X@20 should look at?
Question 2: Do you have any provisional views on any of the ideas presented here?

CHAPTER: Seven

Question 1: Do you have any views on the proposed next steps for the review?

Appendix 2 – Related Ofgem projects

1.1. We present, in this Appendix, a brief overview of the main Ofgem projects that have significant linkages with RPI-X@20. These projects are ongoing or have recently been completed.

1.2. As emphasised in the main paper, decisions from RPI-X@20 will affect the next transmission price control review (at the earliest). Current reviews, notably DPCR5 and TAR, are formally outside of the remit of RPI-X@20. However, to ensure joined-up and consistent thinking the relevant teams are working closely together.

Fifth distribution price control review (DPCR5)

Background to DPCR5

1.3. Electricity distribution costs account for around £3.6 billion annually and make up around 14 per cent of domestic customers' electricity bills. The distribution element of a typical household annual bill is approximately £63.

1.4. Ofgem regulates the 14 distribution network operators (DNOs), who are all regional monopolies, to protect the interests of current and future consumers. We set a price control every five years. This sets the total revenues that each DNO can collect from customers at a level that allows an efficient business to finance their activities. We also place incentives on DNOs to innovate and find more efficient ways to provide an appropriate level of network capacity, security, reliability and quality of service.

1.5. The current price control expires on 31 March 2010 and Ofgem is now undertaking a Distribution Price Control Review (DPCR5) to set the controls for 2010-2015.

Objectives for DPCR5

We have three key objectives for DPCR5, as outlined in our initial consultation document[31] and our policy paper[32]. We intend to maintain the focus on these themes throughout DPCR5.

[31] Electricity distribution price control review, initial consultation document (32/08), http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/Initial%20consultation%20document.pdf

- **Environment:** encouraging DNOs to play a fuller role in helping to tackle climate change, both directly through managing their own carbon footprint and indirectly by facilitating new uses of the networks that are likely to arise as we aim to move to a low carbon economy.
- **Customers:** encouraging all DNOs to pay more attention to all aspects of customer service. These include the quality of service provided by their call centres, the speed and cost of new connections as well as the number and length of any interruptions to customers' supply.
- **Networks:** encouraging DNOs to invest efficiently, so that they provide secure and reliable supply at the lowest possible cost while ensuring that any new assets that they install meet customers' needs into the future and, where possible, take into account how those needs might change.

1.6. DPCR5 will have been a success if the regulatory settlement provides reasonable rewards for delivering these objectives, and if those DNOs that have performed the best (in terms of outputs and efficiency) earn the highest returns.

1.7. In our policy paper we outlined a new measure, based on the return on regulatory equity, to assess company performance under the existing price control and how well the various incentives are working. This measure will help us as we calibrate the incentives that will form the next settlement. It should also help us avoid a narrow focus on the weighted average cost of capital when assessing whether the price control package represents a fair balance of risk and reward between customers and shareholders. We are also considering wider use of constraints (caps and collars) on individual incentive schemes in order to ensure that financial performance can be clearly linked to actual performance.

1.8. For DPCR5, in return for the revenues they collect, we will require each DNO to deliver a predefined set of outputs in a sustainable manner whilst continuing to meet all of their statutory and licence obligations. If any DNO considers the price control package will not deliver them sufficient revenues to meet the agreed outputs and their obligations, they can reject our proposals and we will recommend that the Authority refers the proposed settlement to the Competition Commission. Where a DNO is unable to define a suitable range of measurable outputs we may have to consider a more intrusive regulatory approach to ensure that the settlement does not create opportunities for it to earn returns that are not justified by the service it delivers to customers.

1.9. DPCR5 occurs in a period of considerable uncertainty: in the capital markets; in labour markets; in markets that drive the price of equipment DNOs buy; and in the broader economy which could impact on electricity load growth. There is further uncertainty in how and when network use will respond to a range of environment-

[32] Electricity distribution price control review, policy paper (159/08), http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/POLICY%20PAPER%20DOCUMENT%20File%20problem%20use%20this%20one%2020081126%20PR.pdf

related initiatives such as smart meters and feed-in tariffs for local generation. In the policy paper we set out some initial ideas for dealing with this uncertainty and for ensuring that risk is properly allocated between customers and the DNOs while maintaining the incentive on DNOs to look for further (or new) efficiencies. Uncertainty about what sort of network will be needed for a low carbon economy may require DNOs to think carefully about the discretionary replacement of assets which could become redundant as circumstances change. We will review the DNO investment plans in this light.

1.10. The turmoil in financial markets and associated economic downturn makes it difficult for Ofgem and the DNOs to forecast key elements of the price control, including financing costs. We have an open mind as to whether we should depart from our traditional fixed ex ante assessment of the cost of capital. We will provide an indicative range of the allowed return on capital in the summer of next year, and will look at this element of the settlement along with the incentives that can impact on shareholder returns.

1.11. We would like to see more evidence of DNOs being innovative through trialling new technology and experimenting with new commercial arrangements that might be required in the future. In the policy paper we proposed significant changes to incentives to achieve this. Over the 2010 to 2015 we would expect DNOs to keep their plans under review to make that they are investing in the right equipment and that the networks can adapt to changing needs. DPCR5 needs to provide sufficient flexibility to allow the DNOs to do this.

1.12. DNOs should not forfeit quality of service in the quest for greater efficiency and profits. We are keen to introduce a broad measure of customer satisfaction against which DNO performance can be measured. We outlined in the policy paper that this should cover the range of interactions that customers have with the DNOs and various attributes of customer satisfaction.

Stakeholder engagement

1.13. In our initial consultation document we outlined our expectations that each DNO should consult with its regional stakeholders in order to involve them in the DPCR5 process and to take account of their views. Each DNO has undertaken this work, and has used a variety of approach to do so. We expect DNOs to demonstrate how they have used this work to inform their decisions on the areas that they will focus on for DPCR5.

1.14. In addition to the DNOs' stakeholder engagement we have undertaken a range of stakeholder engagement through tactics such as Ofgem-led workshops (held in May 2008 and January 2009), working groups with DNOs and other interested stakeholders, and an extensive package of consumer research (final report published July 2008).

1.15. We have also established a Consumer Challenge Group whose role is to act as a "critical friend" and ensure that the consumer perspective is considered throughout

the DPCR5 process. We have met with this group four times, to discuss our proposals in detail and they have also met with the Committee of the Authority. We will continue to meet with the Group throughout 2009 and they will be invited to meet with the Committee of the Authority twice more before final proposals are published.

Process for DPCR5

1.16. The consultation period for the policy paper closed on 13 February 2009, and we are currently reviewing the responses received. We are due to receive complete forecast business plan questionnaires (FBPQs) from the DNOs on 27 February 2009. We will publish a methodology and initial results document in early May 2009, which will show the initial results of our benchmarking work and our analysis of the FBPQs.

1.17. We intend to publish initial proposals in late July 2009, which will set out our initial views on allowances and substantive proposals for most policy issues.

1.18. DNOs will submit initial regulatory reporting information in June 2009, followed by a full submission in late July 2009. The DNOs will also submit updated business plans at this stage. However, we do not plan to include this information in initial proposals. If our analysis results in material changes or has a significant impact on our proposals then we may publish an update document in September 2009 providing updated allowances.

1.19. We intend to publish our final proposals document in December 2009. This document will present our final proposals on all outputs and incentives as well as our final views ono allowances, RAV roll forward and cost of capital.

1.20. The DNOs will have until the first week of January 2010 to decide whether to accept our final proposals.

Transmission Access Review (TAR)

1.21. The Energy White Paper, published in May 2007, announced a joint review by Ofgem and the Department for Business, Enterprise and Regulatory Reform (BERR) of the access regime for electricity transmission networks in Great Britain – the Transmission Access Review (TAR). The objective of the review was to deal with the increasing number of electricity generators that have had problems, for a number of years, getting access to the transmission system (this is referred to as the GB Queue). The delays are a particular concern as the generators involved are

primaraily renewable generators and the delays impact on GB's ability to meet its renewables target by 2020[33].

1.22. Ofgem and BERR published the final TAR report[34] in June 2008. We concluded that enduring access arrangements to the transmission network should be based on a clear set of high level principles.

- New generation projects should be offered firm connection dates, reasonably consistent with the development time of their project.
- Generators wanting long term, financially firm access to the system needed to make long term financial commitments.
- Transmission companies needed to have appropriate incentives to respond to the long term demand for access signalled by generators. They also needed the freedom and incentives to invest ahead of full user commitment.
- Access rights should to be more clearly defined and generators needed to be offered choice about how to access the system (a choice between short term and long term products with varying degrees of flexibility).
- In order to make more efficient use of existing and new capacity, it was concluded that better arrangements to share and trade access rights were required.

1.23. Ofgem's TAR project takes forward the conclusions from this final report. It is comprised of a number of workstrands. The first looks at required short-term improvements to the allocation of transmission capacity. The second looks at options for developing an enduring model of transmission access. The third looks at the steps that may need to be taken to help create the appropriate environment so that the TOs build the infrastructure required to meet the GB 2020 renewables target. Some of the investment in infrastructure will need to happen ahead of full user commitment. We describe ongoing developments in each of these workstrands below.

Short-term improvements to the allocation of transmission capacity

1.24. The Ofgem and BERR review of Transmisson access arrangements found that there were concerns with the efficiency of the management of the connection queue. The transmission companies are considering options for improving the management process. National Grid has identified scope to initially advance the connection dates of 450MW of renewable generation in Scotland, but is also exploring the scope to advance a further 1,600MW of renewable generation later on. This will enable new generators to gain access to the system. There are potential concerns that bringing

[33] The existing GB transmission system connects 80GW of generation to meet around 60GW peak demand. To meet the 2020 targets, an additional 60GW of renewable capacity need to be connected.
[34]Ofgem and BERR (2008), Transmission Access Review - Final Report, Report to the Secretary of State, (June) http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar/Documents1/080626_TAR%20Final%20Report_FINAL.pdf

the extra generation onto the transmission network may impact on grid standards (temporarily). We have ensured that this does not prevent Grid from moving ahead with connections by granting permission, for an interim period, for lower grid standards to be adopted.

Enduring arrangements for transmission access

1.25. The Ofgem and BERR review also highlighted a number of concerns with the existing mechanisms used to allocate capacity. There is a lack of user commitment which leads to potentially inefficient investment decisions (e.g. assets that are built but not used). Furthermore, the mechanism which allocates capacity on a "first come first served" basis does not necessarily allocate capacity to those parties that value it most. There was also a concern that delays had occured because of the "invest and connect" principle in the current mechanism. Furthermore, there was a perception that access is not being shared sufficiently, potentially resulting in too many parties being denied the opportunity to access the system.

1.26. In response to these concerns, National Grid developed a suite of proposals to change the Connection and Use of System Code (CUSC). These amendments can be categorised into (at least) three different straw man models.

- **Evolutionary change** – this model would not seek to change the current allocation of access rights in a fundamental way. It comprises a suite of enhancements to the way in which system capacity is made available and would allow for charging closer to real time. It also includes new user commitment provisions which would generate better signals and therefore improve NGET's investment decisions. The aim would be to make the system more efficient.
- **Connect and Manage** – in this model generators wanting to use the transmission system would be offered a firm connection date. If the transmission capacity was not provided on time, the generator would be entitled to compensation. This would enable generators to access the system prior to the completion of wider reinforcement works.
- **Entry Capacity Auctions** – in this model transmission system capacity would be auctioned to bidding generators. These auctions would ensure that those that value the capacity most would be the ones using it and that they would signal commitment to that capacity. This could lead to more efficient capacity allocation and provide better investment signals to National Grid.

1.27. We are working on these proposals with National Grid, through CUSC arrangements.

Incentives to encourage anticipatory investment

1.28. The TAR Final Report concluded that to facilitate the 2020 targets, transmission operators needed to be allowed to make investments ahead of user commitment. We signalled our intention to develop enhanced incentives for the TOs which would allow them to do this. These are divided into short term measures to be implemented on 1 April 2009 and long term measures for implementation later this year. We consulted

on our proposals in December 2008[35] and we are currently developing our proposals, particularly for short term measures.

Further related areas of work

1.29. Alongside these core TAR workstrands, we are considering the implications of other aspects of transmission charging and operations (including with the System Operator) on the transmission network access arrangements.

- **Charging** - A number of the TAR proposals have major interactions with the charging arrangements. We are working with industry, National Grid in particular, to develop charging modifications required alongside the other CUSC changes discussed above. Areas of work include: potentially introducing long term fixed transmission network use of system charges to reinforce long term user commitment for finite rights; making charges more cost-reflective of the short run costs for new type of access such as overrun; introducing specific charging arrangements for "local only" access rights; and calculating reserve prices for auctions. In February 2009, we raised a number of immediate concerns relating to the ability of current charging arrangements to effectively manage the costs of constraints and to recover these costs on an equitable basis[36].
- **System Operator incentives** - Some of the CUSC proposals imply significant interactions with the way in which the GB System Operator and the transmission owners are incentivised to build and release capacity and to manage the constraints on the transmission system. We are considering interactions between the System Operator incentives and those developing through TAR.
- **Security and quality of supply standards review** - Building on earlier reviews, we have asked the three TOs to undertake a fundamental review of the GB Security and Quality of Supply Standard (SQSS) to consider the implications of moving to a transmission system with over 35GW of connected renewable generation.

1.30. These areas of work are being conducted alongside the core workstrands described earlier.

Next steps

1.31. An Impact Assessment for the CUSC modifications will be published in April 2009. This document will also include analysis on necessary changes to SO

[35] Ofgem (2008), Transmission Access Review – Initial Consultation on Enhanced Transmission Investment Incentives, Ref 175/08, December http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar/Documents1/081219_TOincentives_consultation_FINAL.pdf

[36] Ofgem (2009), Letter to National Grid Electricity Transmission: Managing Constraints on the GB Transmission System, February http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar/Documents1/20090217Managing%20constraints.pdf

incentives and charging arrangements. This will enable the Authority to take decisions on the modifications in July. Most changes to the CUSC could then be implemented in April 2010. This timetable is currently under review because some of the charging modifications will not be submitted to us in time to be included in the April Impact Assessment.

1.32. We have completed an initial consultation on enhanced TO incentives and are in the process of developing final proposals for the short term measures in time for implementation on 1 April 2009. Long term measures will be consulted upon again and implemented next winter. The GBSQSS review is due to publish its findings in September 2009 and will produce proposals for change in December 2009.

LENS

1.33. In 2007/2008 we undertook a study to develop a range of plausible electricity network scenarios for Great Britain for 2050. The Long-Term Electricity Networks Scenarios (LENS) project was undertaken with academic experts, and involved significant contribution from stakeholders through workshops and consultations.

1.34. We published the final report[37] in November 2008. This summary describes the background to the LENS project, explains the key findings from the project to date, and sets out our initial views on the implications of this work for networks and regulatory policy and next steps.

Background

1.35. The final LENS report delivers on our commitment, in response to the Government's Energy Review of May 2006, to play a central role in developing a long-term perspective on the challenges that energy networks will face and how they might need to change.

1.36. The main objective of the LENS project was to develop a range of plausible electricity network scenarios for Great Britain for 2050, around which industry participants, Government, Ofgem and other stakeholders can discuss longer term network issues. The project has also set out: to develop a consistent set of 'way-markers' for 2025 (which provide an early indication of the 'direction of travel'); and to quantify key features of the scenarios through energy system modelling.

[37] Electricity Network Scenarios for Great Britain in 2050, Final Report for Ofgem's LENS Project (Ref. No. 157/08), November 2008. Authors: Graham Ault, Damien Frame (Institute for Energy and Environment, University of Strathclyde), Nick Hughes, Neil Strachan (King's College London, University of London). Peer reviewers: Jim Watson (SPRU, University of Sussex), Michael Pollitt (Judge Business School, University of Cambridge).
http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/lens/Documents1/20081107Final%20Report.pdf

1.37. The project did not aim to prescribe particular strategies for stakeholders, nor did it seek to forecast or predict the costs, desirability or the likelihood of specific outcomes. We considered the range of technology uncertainties too large to make any such assesment meaningful.

1.38. Ofgem led the project, with support from our academic partners and peer reviewers. Input from the industry, and other external stakeholders, has been extensive. Stakeholder feedback throughout the consultation process was consistently positive, and respondents confirmed that the proposed scenarios covered a suitably wide range of plausible outcomes for the sector.

Key findings

1.39. The project team, consisting of Ofgem and its academic partners, identified three main drivers of change, which are summarised in the table below:

Driver for change	Description
Environmental concern	The level to which the environment affects the decision-making of individuals, communities, private companies, public institutions and the Government (on a UK and European/global basis)
Institutional governance	The extent to which institutions (both public or private, and both domestic and European) intervene in the energy market and the development of the electricity networks
Consumer participation	The level to which all types of consumers (commercial, industrial, domestic and public) are willing to participate actively in the energy/electricity market

1.40. Based on these themes, the project team applied a robust methodology in order to identify five plausible electricity network scenarios for Great Britain in 2050:

- **Big Transmission and Distribution**, in which transmission system operators (TSOs) are at the centre of networks activity. Network infrastructure development and management continues as expected from today's patterns, while expanding to meet growing demand and the deployment of renewable generation.
- **Energy Service Companies**, in which energy service companies (ESCOs) are at the centre of developments in networks, doing all of the work at the customer side. Networks contract with such companies to supply network services.
- **Distribution System Operators**, in which distribution system operators (DSOs) take on a central role in managing the electricity system. Compared to today, this scenario would see much more distributed generation. It would also see distribution companies taking more responsibility for system management.
- **Microgrids**, in which customers are at the centre of activity; electricity consumers take more responsibility for managing their energy supplies and their demand. Microgrid system operators emerge to provide the system management capability to meet customer needs.

- **Multi Purpose Networks**, in which network companies respond to emerging, and potentially changing, policy and market requirements. The transmission system operators retain the central role in developing and managing networks, but distribution companies also have a more significant role to play. The network is characterised by diversity in network development and management approaches.

1.41. As noted earlier, all scenarios are plausible and we have not formed on a view on which are the most likely ones (or one) to develop.

Implications of the LENS scenarios

1.42. We expect that the LENS scenarios will have a number of implications for networks and regulatory policy.

- There is a relatively high degree of uncertainty around the future of the electricity sector. The breadth of the LENS scenarios suggests a range of plausible outcomes for the GB energy sector and for electricity networks that is perhaps wider than has been acknowledged in recent debates. They imply that radical change for the electricity sector, including networks and related sectors (such as transport and heat), is both possible and, depending on how key underlying driving forces play out, plausible.
- The breadth of the scenarios suggests that regulatory policy will need to be sufficiently flexible and adaptable to accommodate this uncertainty and the potential for radical change. It also suggests that when developing policy we should consider, to the maximum extent possible, the implications of the LENS scenarios.
- There is potentially significant value in keeping options open. For several scenarios, stakeholders may need to develop strategies and act on them in relatively short timeframes. It will be important, particularly in the context of protecting the interests of future consumers, that Ofgem and other policy makers do not inadvertently 'close off' options for the development of the networks and the wider sector they serve. This includes policy makers at national and European levels.
- The scenarios imply significant differences in the allocation of roles and responsibilities across the sector. For example, some scenarios imply the need for significantly different types and levels of customer response.
- As a regulator, we may need to deploy regulatory tools in a different way, or develop new tools. For example, new (or revised) policies may be needed to encourage innovation and to support the entry of new kinds of players into the sector.

1.43. The issues raised by LENS are not limited to the regulation of networks; they pose fundamental questions about other areas such as market structure and broader energy and environmental policy, in the United Kingdom and across Europe. The implications of the LENS scenarios are not just for Ofgem to manage, but also for other stakeholders, including Government, industry and possibly European decision-makers.

1.44. Our work to consider further the implications of the LENS scenarios for the regulation of networks will be initially taken forward through RPI-X@20.

Offshore transmission

1.45. Offshore wind is an essential component of dealing with the challenge of climate change and energy security. The UK recently overtook Denmark as the country with the largest offshore wind deployment in the world with 598MW now installed. At the end of 2008 the Secretary of State for Business announced proposals for a potential major expansion of UK offshore wind, with a draft plan that could allow companies to develop up to a further 25 GW of offshore wind by 2020 on top of the 8GW already expected to be delivered[38]. Ensuring that we have the regime in place to enable transmission of offshore renewable electricity effectively to the onshore grid is crucial.

1.46. At present there is very little electricity network infrastructure installed offshore and it is expected that some £15 billion of investment will be needed in new offshore transmission to carry the renewable energy ashore. The scale of the offshore wind planned means we need a regulatory regime in place for offshore transmission to support offshore wind development and ensure secure supplies. A regulated offshore transmission regime is expected to provide lower costs and greater certainty to offshore generators, thereby helping ensure their overall project delivery. The Government has decided that there will be a competitive tendering process, run by Ofgem, to appoint parties to own and operate the new transmission infrastructure needed by the offshore generators.

1.47. Ofgem and the Government have been working to establish an offshore transmission licensing regime, to support the connection of offshore generation to the onshore electricity network, in a timely and cost effective manner. Details on the proposed arrangements can be found on our website[39]. We will be shortly publishing our final consultation, with DECC, on the regulatory framework for offshore transmission.

1.48. Essentially the system for the provision of a GB onshore grid connection is being extended offshore – with the generator seeking a grid connection offer from the GB System Operator (GBSO) and the grid connection being provided by an independent transmission company - an Offshore Transmission Owner (OFTO). The generator then pays for the use of the transmission system through the transmission charging methodology determined by the GBSO. The aim is to create a framework

[38] Up to 8GW of offshore wind farm generation capacity has already been awarded leases by the Crown Estate under licensing Rounds 1 and 2. On 4 June 2008, the Crown Estate launched the leasing process for Round 3 projects to facilitate the delivery of this additional generation. In addition, on 16 February 2009 the Scottish Executive and The Crown Estate announced the award of 10 exclusivity awards to build offshore wind farms in Scottish territorial waters. The total award capacity is over 6 GW.
[39] http://www.ofgem.gov.uk/Networks/offtrans/Pages/Offshoretransmission.aspx

for efficient investment in offshore transmission networks, allow scope for technical and operational innovation, and nesure sufficient flexibility to meet the needs of future offshore generators.

1.49. Following consultation, the Government concluded in March 2007 that there should be tenders for financing, designing, building, owning and maintaining specific offshore transmission assets. We were given powers to run these tenders in the Energy Act 2008. Under the regime, we will conduct competitive tenders to grant licences to offshore transmission owners (OFTOs). An OFTO will be responsible for the design, financing, construction and operation and maintenance of new transmission assets over a 20 year revenue stream period. There will also be transitional arrangements for offshore renewable projects that are already operating, under construction or financially closed. In these projects, the OFTO will buy the constructed assets from the generator and operate and maintain them for the 20 year period.

1.50. Tenders for transitional projects are expected to commence in summer 2009, following the commencement of the regime in June 2009. The "enduring" projects, requiring the prospective OFTO to construct the assets, are expected to be tendered the following year.

1.51. DECC and Ofgem's November 2008 Policy Update set out updated policy proposals and detailed drafting of the various codes and standard licence conditions that are considered appropriate to implementing the offshore transmission regime. This included proposals on the regulatory regime, including the form of incentives and the treatment of uncertain costs and benefits that arise over the life of the transmission assets. These can be summarised as follows:

- The period of the initial revenue stream will normally be 20 years;
- Where there is a demonstrable ongoing generation need for the offshore transmission assets beyond the end of the initial 20 year revenue stream, the Authority will consider, on a case-by-case basis, whether to set a revenue stream for a further period or undertake a further tender exercise to appoint an OFTO;
- We do not intend to introduce pre-defined adjustment for unpredictable and uncertain costs and savings that may emerge over the life of the transmission system;
- An appointed OFTO will, at the discretion of Ofgem, be allowed to undertake incremental investment up to a value of 20 per cent of the initial capital cost over the life of the offshore transmission systems without being subject to a further tender exercise, providing that the additional investment is generator led;
- There will be adjustment mechanisms for certain predictable but uncertain costs and savings that may emerge over the life of the transmission system;
- We propose to adopt an asymmetric incentive for operational availability. Default targets and incentive rates are proposed, with up to 10 per cent of the OFTOs annual regulated revenues exposed to the incentive. We have set out the detailed design of the operational availability incentive framework; and
- We propose appropriate ring fencing provisions between the GBSO and its Offshore Transmission business.

1.52. Most issues set out in the policy framework for the price control regime will be implemented in the form of Special Conditions of the transmission licence agreed as part of the tender exercise.

Electricity distribution structure of charges

1.53. Electricity distribution use of system (UoS) charging methodologies determine the level of charges faced by customers for use of the distribution networks. Ofgem has a duty to consider the methodologies used by Distribution Network Operators (DNOs) to determine charges for connection to and use of their distribution systems.

1.54. In reviewing existing arrangements we have concluded that in many cases, basic charging methods dated back a number of years and as such did not reflect the changing profile of system usage. In particular we have noted that the increasing prevalence of distributed generation connecting to DNOs' systems along with high investment costs meant that targeted, cost reflective messages need to be provided to users of the distribution system.

1.55. The principal objective of the structure of charges project is to bring about implementation of a revised cost reflective charging methodology which incentivises efficient use of the distribution system by demand and generation customers across all GB networks. In 2005[40] we aligned the connection boundary for demand and generation customers, and introduced use of system charges for generators. We expected DNOs to rapidly progress development of their charging methodologies for load and generation to ensure that they took account of developments on their networks, particularly at Extra High Voltage (EHV) level where we anticipated locational charging signals. Over the last number of years the DNOs have missed several deadlines and made limited progress towards achieving this and by April 2008 only one DNO group company, Western Power Distribution, had implemented a revised long term EHV level charging methodology.

1.56. Following consultation in April[41], we decided in July 2008[42] that it was necessary to introduce a formal licence obligation on DNOs to deliver the project. We set out our view that with few exceptions current methodologies: do not encourage

[40] Ofgem (2005), Structure of electricity distribution charges: consultation on the longer term charging framework, May. http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgs/Documents1/10763-13505.pdf

[41] Ofgem (2008), Delivering the electricity distribution structure of charges project: consultation paer, April http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgs/Documents1/Sof%20C%20Project%203608.pdf

[42] Ofgem (2008), Letter to distribution network operators: Delivering the electricity distribution structure of charges project: decision on a common methodology for use of system charges from April 2010, consultation on the methodology to be applied across the DNOs and consultation on governance arrangements, October http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgs/Documents1/FINAL%20July%20consultation%20letter_22_07_08.pdf

customers to locate in areas where there is spare capacity; fail to encourage distributed generation (DG) to locate in parts of the network that would avoid the need for network investment; and do not provide incentives to encourage demand side management.

1.57. We also explained that in the course of our work on distribution charges it had become increasingly apparent that managing the range of different UoS methodologies in use across the networks imposes significant costs on generators and suppliers, costs which ultimately increase energy bills for domestic and business customers. For these reasons we concluded that it would be appropriate for DNOs to implement a single common, cost reflective distribution charging methodology with common governance arrangements by 1 April 2010.

1.58. In October 2008 we held a statutory consultation on a proposal to introduce these obligations to each DNO's distribution licence. Four distribution licensees out of 19 objected to the proposal creating a blocking minority. The statutory objections came from Scottish and Southern Energy and Scottish Power Energy Networks who hold two DNO licences each. Both companies cited our decision to require DNOs to apply a Long Run Incremental Cost (LRIC) methodology at EHV level on the distribution networks as the reason for their objection. The debate over the most appropriate methodology to apply at EHV level has been long running and SP and SSE favour their own approach to EHV charging above the LRIC approach.

1.59. Following defeat of our October proposal, in December[43] we published a consultation seeking views on how best to progress the project. Following the close of this consultation in late January we are currently determining next steps. In the meantime, DNOs have been voluntarily progressing work on a common HV/LV charging methodology.

National and EU policy

1.60. At national level, we are working with the Department for Energy and Climate Change (DECC), and other relevant government departments, to ensure that we are joined-in with relevant policy developments including but not limited to:

- renewables energy strategy, including extension of renewables obligations (with banding), design of feed-in tariffs for electricity up to 5MW, and the design of the Renewable Heat Incentive;
- heat and energy savings strategy, and proposed targets for zero carbon homes and non-domestic buildings;
- decisions on specification of smart meters and roll-out to households by 2020;

[43] Ofgem (2008), Next steps in delivering the electricity distribution structure of charges project: consultation, December
http://www.ofgem.gov.uk/Networks/ElecDist/Policy/DistChrgs/Documents1/Dec%20Con%20Doc.pdf

- implementation of provisions under the Planning Act 2008, including development of the National Policy Strategy for Energy;
- the administration of specific schemes (for example the Carbon Emissions Reduction Target (CERT) and the Community and Energy Savings Programme (CESP));
- work on grid access through TAR and development of network plans to 2020 by the Electricity Network Strategy Group; and
- development of the offshore transmission regime.

1.61. We will also provide input to the Energy and Climate Change Select Committee's work on "The Future of Britain's Electricity Networks" and we will consider implications of their work for RPI-X@20.

1.62. We also have a number of teams working on EU issues with their counterparts in DECC and in Brussels. We are contributing to these debates via the various groups that function under the auspices of the Council of European Energy Regulators (CEER) and the European Regulators' Group for Electricity and Gas (ERGEG). Key areas of interest for this review include developments on:

- the Second Strategic Energy Review[44], including the Green Paper on Energy Networks[45];
- developing ideas on future network scenarios and planning;
- implementation of the Third Package of European legislation;
- Phase 3 of the EU Emissions Trading Scheme (ETS); and
- Gas and Electricity Regional Initiatives.

1.63. We will ensure that developments in these areas are reflected in RPI-X@20.

[44] European Commission, 'Second Strategic Energy Review: An EU Energy Security and Solidarity Action Plan', Communication from the Commission to the European Parliament, the Council, the European Economics and Social Committee and the Committe of the Regions', November 2008.
[45] European Commission, 'Towards a secure, sustainable and competitive European Energy Network', November 2008.

Appendix 3 - Price review timelines

1.1. We provide the timelines for the price reviews in the electricity and gas transmission and distribution price controls since privatisation. Further details can be found in our supporting paper "History of energy network regulation"[46].

[46] http://www.ofgem.gov.uk/Networks/rpix20/publications/Pages/Publications.aspx

Figure 4: Timeline of Electricity Distribution Price control reviews

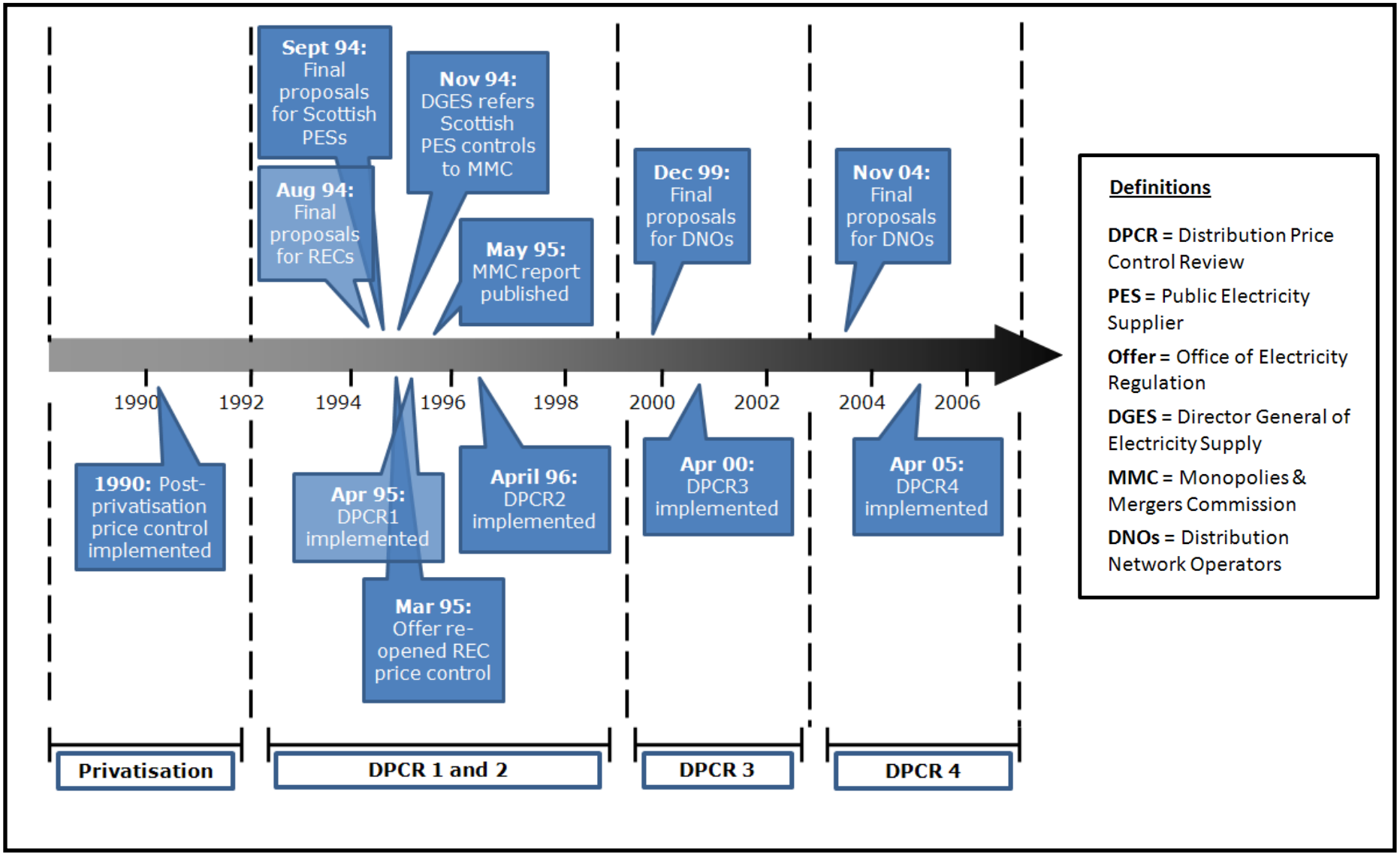


Figure 5: Timeline of Electricity Transmission Price control reviews

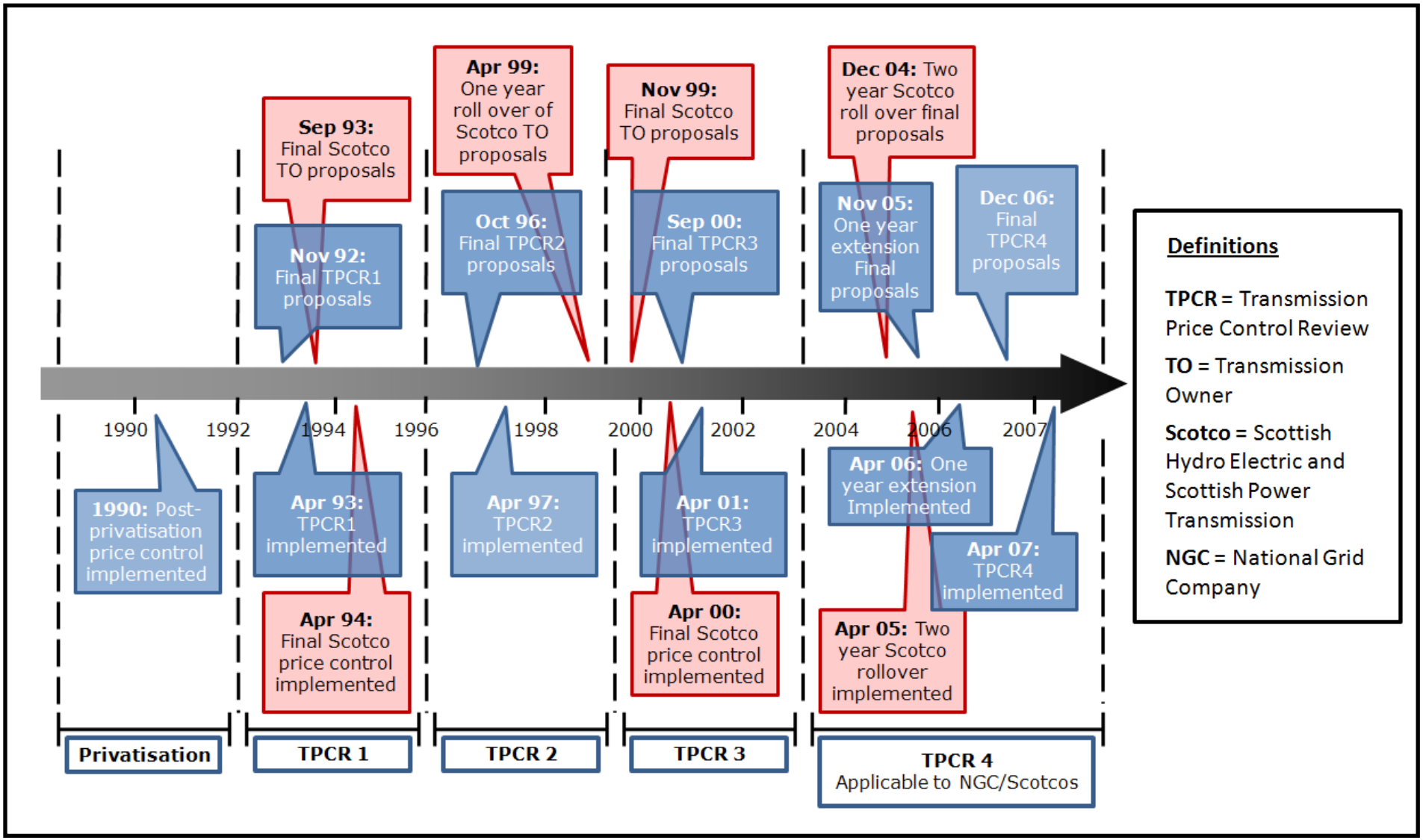


Figure 6: Timeline of Gas Transmission Price control reviews

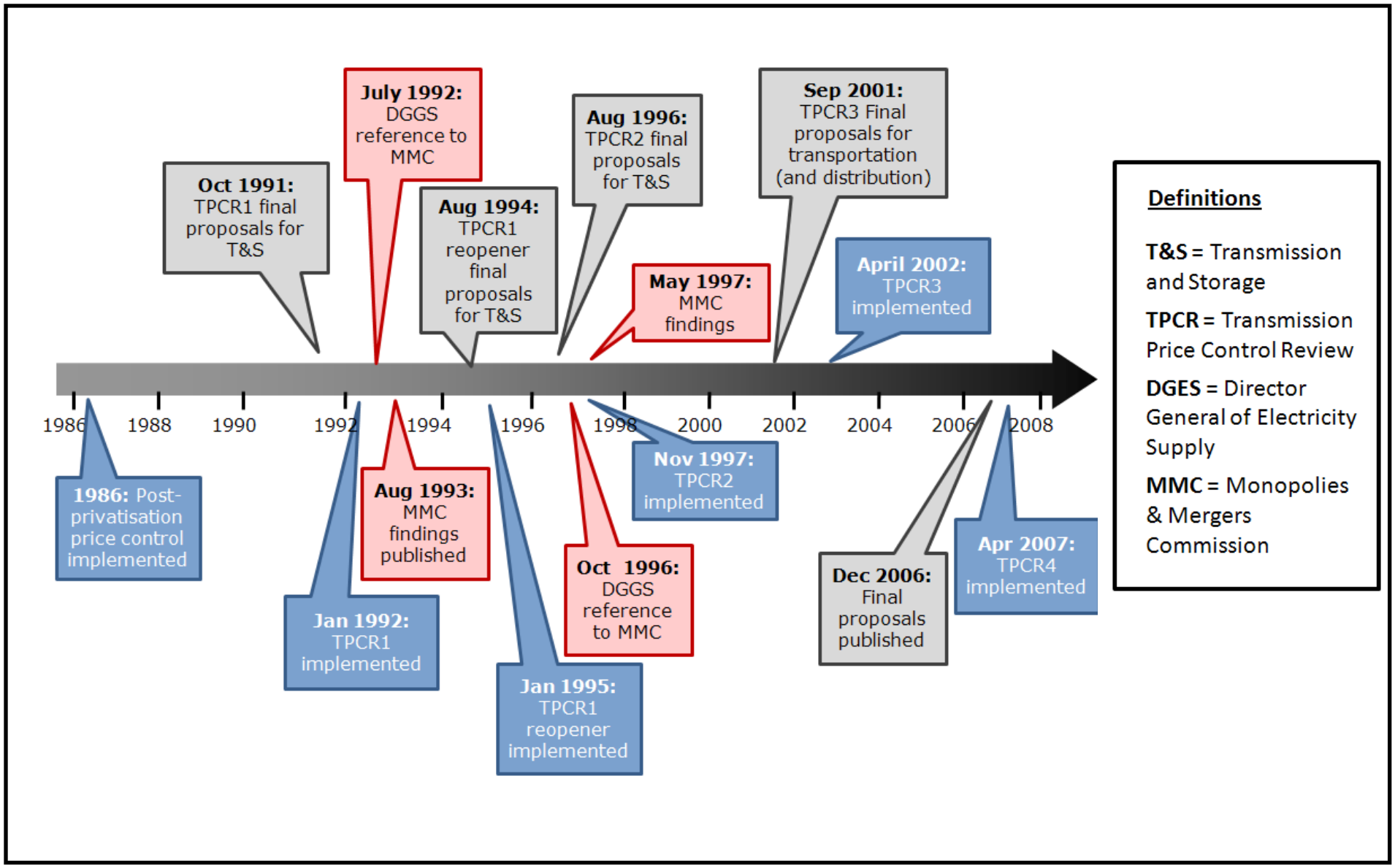
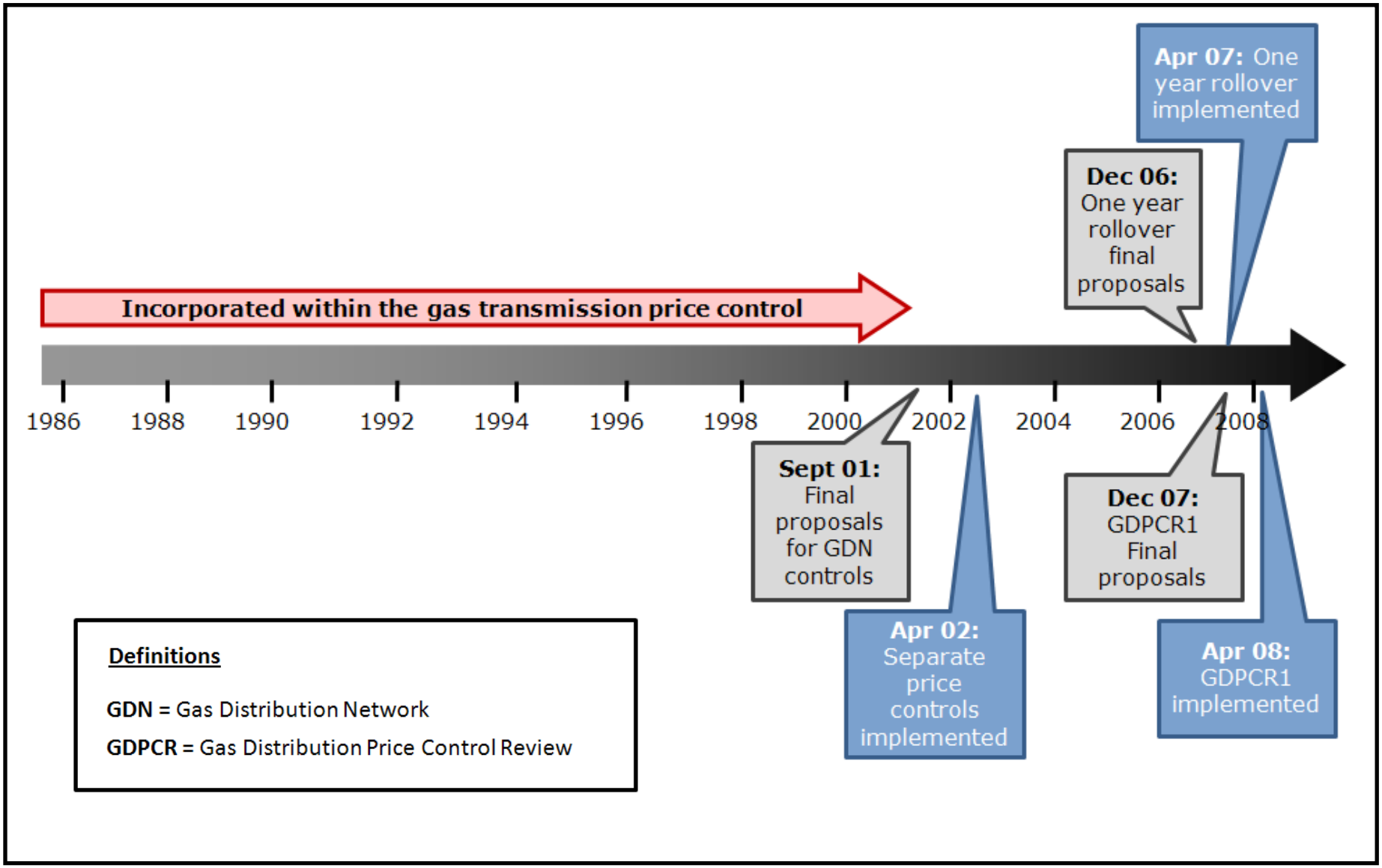


Figure 7: Timeline of Gas Distribution Price control reviews



Appendix 4 – The Authority's powers and duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ("the Authority"), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.[47]

1.3. Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly[48].

1.4. The Authority's principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of existing and future consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

1.5. The Authority must when carrying out those functions have regard to:

- the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- the need to secure that all reasonable demands for electricity are met;
- the need to secure that licence holders are able to finance the activities which are the subject of obligations on them[49];
- the need to contribute to the achievement of sustainable development; and
- the interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[50]

1.6. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

[47] Entitled "Gas Supply" and "Electricity Supply" respectively.
[48] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.
[49] Under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.
[50] The Authority may have regard to other descriptions of consumers.

- promote efficiency and economy on the part of those licensed[51] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems;
- protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity; and
- secure a diverse and viable long-term energy supply.

1.7. In carrying out the functions referred to, the Authority must also have regard, to:

- the effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity;
- the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and
- certain statutory guidance on social and environmental matters issued by the Secretary of State.

7.7. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation52 and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[51] or persons authorised by exemptions to carry on any activity.
[52] Council Regulation (EC) 1/2003

Appendix 5 - Glossary

A

Active Distribution Network

The function of an active distribution network is to efficiently link power sources with consumer demands, allowing both to decide how best to operate in real time.

The Authority/ Ofgem

Ofgem is the Office of the Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (GEMA), the body established by section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in GB.

Asset stranding

Investment in assets that ultimately are not used or needed

B

Baseline

Baselines define the reference levels of capacity that the transmission licensee is to release. Baselines also determine the levels above (or below) which incremental capacity is defined.

Baseline Capital Expenditure

Baseline capital expenditure is the total amount of capex required in association with the baseline. It includes both load related capex and non-related capex.

Better regulation

Looking to ensure that where regulation is necessary, it is proportionate, consistent and targeted towards to the issues it is seeking to address.

British electricity Trading and Transmission Arrangements (BETTA)

BETTA introduced a single GB-wide set of arrangements for trading energy and for access to and use of the transmission system.

Department for Business, Enterprise & Regulatory Reform (BERR)

C

Capacity (gas)

The amount of natural gas that can be produced, transported, stored, distributed or utilised in a given period of time under design conditions.

Capital expenditure (capex)

Expenditure on investment in long-lived distribution assets, such as underground cables, overhead electricity lines and substations.

Carbon Capture

Removal of CO2 from fossil fuels either before or after combustion. In the latter the CO2 is extracted from the fluegas.

Carbon Emissions Reduction Target (CERT)

The CERT programme replaced the Energy Efficiency Commitment 2005-2008 as the government's domestic efficiency obligation on energy suppliers. It sets an obligation of energy suppliers to reduce CO2 emissions, by promoting energy efficiency and mirco renewables to domestic energy users.

Carbon Footprint

Total amount of greenhouse gas emission caused directly and indirectly by the operation of business.

Constructive engagement

Process whereby different parties are given the opportunity to reach an agreement on a number of issues, with the regulator acting as a facilitator.

Contracting out

A business relationship, where the contracting body grants responsibility for the provision of a good or service to an external organisation.

Combined Heat and Power (CHP)

The simultaneous generation of usable heat and power (usually electricity) in a single process, thereby discarding less wasted heat.

Customer interruptions (CIs)

The number of customers whose supplies have been interrupted per 100 customers per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident.

Customer minutes lost (CMLs)

The duration of interruptions to supply per year – average customer minutes lost per customer per year, where an interruption of supply to customer(s) lasts for three minutes or longer

Connection and use of system code (CUSC)

A multi-party document creating contractual obligations among and between users of the GB transmission system, parties connected to the GB transmission system and national grid, in relation to their connection to and use of the transmission system.

D

Department for Environment, Food and Rural Affairs (DEFRA)

Department of Energy and Climate Change (DECC)

Depreciation

Depreciation is a measure of the consumption, use or wearing out of an asset over the period of its useful economic life.

Discretionary reward scheme (DRS)

An Ofgem run scheme designed to financially reward DNOs and GDNs for better performance in areas that cannot be easily measured or incentivised

Distributed generation (DG)

Distributed generation is also known as embedded or dispersed generation. It is an electricity generating plant connected to a distribution network rather than the transmission network.

Distribution Network Operators (DNOs)

A DNO is a company which operates the electricity distribution network which includes all parts of the network from 132kV down to 230V in England and Wales. In Scotland 132kV is considered to be a part of transmission rather than distribution so their operation is not included in the DNOs' activities.

There are 14 DNOs in the UK which are owned by seven different groups:

CN West	Central Networks West plc licence holder for West Midlands
CN East	Central Networks East plc licence holder for East Midlands
ENW	Electricity North West Limited licence holder for North West England
CE NEDL	Northern Electric Distribution Limited licence holder for North East England
CE YEDL	Yorkshire Electric Distribution Limited licence holder for Yorkshire
WPD S Wales	Western Power Distribution (South Wales) plc, licence holder for South Wales
WPD S West	Western Power Distribution (South West) plc, licence holder for South West England
EDFE LPN	EDF Energy Networks (SPN) plc, licence holder for south east England
EDFE SPN	EDF Energy Networks (LPN) plc, licence holder for London
EDFE EPN	EDF Energy Networks (EPN) plc, licence holder for eastern England
SP Dist	SP Distribution Limited, licence holder for central and southern Scotland
SP Manweb	SP Manweb plc, licence holder for Merseyside and North Wales
SSE Hydro	Scottish Hydro Electric Power Distribution Limited, licence holder for northern Scotland
SSE Southern	Southern Electric Power Distribution Limited, licence holder for southern England

Distribution Price Control Review 4 (DPCR4)

The price control applied to the electricity distribution network operators. This price control runs from 1 April 2005 until 31 March 2010.

Distribution Price Control Review 5 (DPCR5)

The next price control to be applied to the electricity distribution network operators. This price control is expected to run from 1 April 2010 until 31 March 2015.

Demand side management (DSM)

Demand side management (or load management) is any mechanism that allows a customer's demand to be intelligently controlled in response to events on the power system. Such events would include lack of network capacity or insufficient generation.

Drinking Water Inspectorate (DWI)

The regulator responsible for monitoring and regulating the quality of drinking water in England and Wales.

E

Environment Agency (EA)

The regulator responsible for monitoring and regulating environmental policy across a range of sectors in England and Wales.

The Environmental Advisory Group (EAG)

An independent panel of environmental experts that help guide Ofgem's green agenda. The group is made up of policy experts from Government, industry and the green groups who advise Ofgem on the priorities for its work in relation to the environment.

The Energy Networks Association (ENA)

A trade body that represents the gas and electricity transmission and distribution companies in the UK.

Electricity Networks Strategy Group (ENSG)

Industry focus group for network issues. The aim of the ENSG is to identify, and co-ordinate work to address the technical, commercial, regulatory and other issues that affect the transition of electricity transmission and distribution networks to a low-carbon future.

European Union Emissions Trading Scheme (EU ETS)

A cap and trade scheme in which EU Member State Governments are required to set emissions limits for all installations in their country covered by the scheme. It is an administrative approach used to reduce the cost of pollution control by providing economic incentives for achieving reductions in the emissions of greenhouse gases.

F

Financeability

Financial models are used to determine whether the regulated energy network is financeable under the proposed price control. Financeability is assessed using a range of different financial ratios.

Forecast business plan questionnaire (FBPQ)

The FBPQ is the forecast business plan questionnaire through which data is collected on the business plans of the 14 distribution network operators to help Ofgem form initial views on the revenue requirements of the companies for the DPCR.

Franchising

The provision (subject to conditions) of a protected or exclusive right to exploit or carry out an activity for a given time period. Businesses will often bid for this exclusive right and in this respect, franchising replaces competition in a market with competition for the market.

Fuel poverty

A fuel poor household is defined as one that needs to spend at least 10% of household income on all fuel use in order to maintain a satisfactory heating regime. G

Gas distribution networks (GDNs)

GDNs transport gas from the National Transmission System to final consumers and to connected system exit points. There are currently eight GDNs in Great Britain which comprise twelve local distribution zones, owned by four groups:

NGG, the GT licence holder for the North West, West Midlands, East England and London GDNs
Northern Gas Networks (NGN), the GT licence holder for Northern GDN
Scotia Gas Networks (SGN), the GT licence holder for Southern GDN & Scotland GDN
Wales & West Utilities (WWU), the GT licence holder for Wales & West GDN.

Gas Distribution Price Control Review (GDPCR)

The review of the price control applying to gas distribution networks. The review extended the existing price control for the year 2007-08 and reset the control for the period commencing 1 April 2008.

Gas Transporter (GT)

The holder of a Gas Transporter's licence in accordance with the provisions of the Gas Act 1986.

Gearing

A company’s net debt expressed as a percentage of its total capital.

Guaranteed Standards of Performance (GSOPs)

Guaranteed Standards set service levels to be met in each individual case and are established by a Statutory Instrument. If the licence holder fails to provide the level of service required, it must make a payment to the customer affected subject to certain exemptions.

H

Heat and Energy Saving Strategy Consultation

A consultation document jointly published by Department of Energy and Climate Change (DECC) and the Department for Communities and Local Government (CLG). The document sets out the Government's vision up to 2020 and beyond, and seeks views on a range of policies which could help to decarbonise the way homes and businesses are heated.

High Voltage (HV)

Includes all voltage levels above 1kV up to and including 20kV.

I

Independent distribution network operator (IDNO)

Own and operate electricity distribution networks, which will predominantly be networks extensions e.g. to serve new housing developments.

Innovation funding Initiative (IFI)

A mechanism to remunerate research & development expenditure by DNOs.

Independent gas transporter (IGT)

IGTs are GT licence holders that own and operate small local gas networks and levy distribution charges on shippers.

Information Quality Incentive (IQI)

The IQI mechanism incentivises DNOs not to inflate their forecasts. It does this in two ways: by giving additional income to companies who forecast spend close to our assessment; and by providing these companies with a higher incentive rate than those companies with higher capex forecasts, thereby increasing their rewards for outperformance.

L

Large Combustion Plant Directive (LCPD)

The LCPD aims to reduce acidification, ground level ozone and particles throughout Europe by controlling emissions of sulphur dioxide (SO2), nitrogen oxides (NOx) and dust (particulate matter (PM)) from large combustion plants (LCPs). These include plants in power stations, petroleum refineries, steelworks and other industrial processes running on solid, liquid or gaseous fuel.

Long-term Energy Network Scenarios (LENS)

Study which looks at a range of future scenarios for electricity networks that could arise as a consequence of market and policy developments.

Liquefied Natural Gas (LNG)

LNG is natural gas that has been condensed into a liquid at atmospheric pressure by cooling it to approximately -163 degrees Celsius. LNG is transported by specifically designed vessels and stored in specially designed tanks. LNG is about 1/600th the volume of natural gas, making it much more cost – efficient to transport over long distances where pipelines do not exist.

Load related expenditure (LRE)

The installation of new assets to accommodate changes in the level or pattern of electricity or gas supply and demand.

Low carbon economy

An Economy which has a minimal output of Greenhouse gas emissions.

Low Voltage

All voltage levels up to and including 1kV.

M

Microgeneration

The small-scale generation of heat and/or electricity from a low carbon source, for example solar panels, micro-wing, micro combined heat and power and heat pumps.

N

National Grid Gas (NGG)

The gas transporter (GT) licence holder for the North West, West Midlands, East England and London GDNs. NGG also hold the GT licence for the gas transmission system.

National Grid Electricity Transmission (NGET)

NGET owns and maintains the high-voltage electricity transmission system in England and Wales.

National Transmission System (NTS)

The high pressure gas transmission system covering Great Britain, owned and operated by National Grid.

Net present value (NPV)

Net present value is the discounted sum of future cash flows, whether positive or

negative, minus any initial investment.

Non-load related capex

The costs of the day to day operation of the network such as staff costs, repairs and maintenance expenditures, and overheads.

O

Offshore transmission

The majority of offshore generation will be connected to the GB electricity grid through offshore transmission cables. Offshore transmission is defined as being any offshore transmission network that operates at 132kV or above.

Operating expenditure (OPEX)

Expenditure on operating and maintaining the network, e.g. fault repair, tree cutting, inspection and maintenance, engineering and business support costs.

Option value

The potential value of a resource for future (direct or indirect) use.

Overall Standard of Performance (OSOP)

Overall standards of performance set minimum average levels of performance in areas where it is not necessarily appropriate to put in place guarantees for individual consumers. These are determined separately for each gas transporter by the Authority.

P

Pension Protection Fund (PPF)

The Pension Protection Fund established to pay compensation to members of eligible defined benefit pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover Pension Protection Fund levels of compensation.

Priority Services Register (PSR)

PSR includes domestic consumers who are of pensionable age, have a disability, have long term ill health, and/ or are blind or visually impaired. Individuals on this register qualify for a selection of free services by gas and electricity suppliers.

R

Rate of return mechanism

Allows a regulated body to recover the costs associated with providing a set of regulated services, including an allowable rate of return on its regulated asset base.

Regulatory asset value (RAV)

The value ascribed by Ofgem to the capital employed in the licensee's regulated distribution or (as the case may be) transmission business (the 'regulated asset base'). The RAV is calculated by summing an estimate of the initial market value of each licensee's regulated asset base at privatisation and all subsequent allowed additions to it at historical cost, and deducting annual depreciation amounts calculated in accordance with established regulatory methods. These vary between classes of licensee. A deduction is also made in certain cases to reflect the value realised from the disposal of assets comprised in the regulatory asset base. The RAV is indexed to RPI in order to allow for the effects of inflation on the licensee's capital stock. The revenues licensees are allowed to earn under their price controls include allowances for the regulatory depreciation and also for the return investors are estimated to require for providing the capital.

Re-openers

A process undertaken by Ofgem to re-set the revenue allowances (or the parameters that give rise to revenue allowances) under a price control before the scheduled next formal review date for the relevant price control.

Revenue Driver

A means of linking revenue allowances under a price control to specific measurable events which are considered to influence costs. An example might be to allow a specified additional revenue allowance for each MW of new generation connecting to the network. Revenue drivers are used by Ofgem to increase the accuracy of the revenue allowances.

Renewables Obligation (RO) and Renewables Obligation Scotland (ROS)

The RO places an obligation on licensed electricity suppliers in the United Kingdom to source an increasing proportion of electricity from renewable sources. Suppliers meet their obligations by presenting Renewables Obligation Certificates (ROCs) or payment into the buy-out fund.

Renewables Obligation Certificates (ROCs)

A transferable certificate received by eligible renewable generators for each MWh of electricity generated. ROCs are traded separately from power and are used by suppliers to fulfil their Renewables Obligations under the Utilities Act 2000.

RPI-X

The form of price control currently applied to network monopolies. Each company is given a revenue allowance in the first year of the control period. The price control then specifies that in each subsequent year the allowance will move by 'X' per cent in real terms.

Registered Power Zones (RPZ)

RPZ is a mechanism to encourage DNOs to develop and demonstrate new and more cost effective technologies for connecting and operating generation on their distribution.

S

Second strategic energy review

On November 2008, the EU proposed a wide ranging energy programme. In particular it is intended to: build up solidarity between member states on energy issues; stimulate energy network investment to facilitate low carbon energy sources; secure sustainable energy supplies through a 'Security and Solidarity Action Plan'; and promote greater efficiency in use of energy.

Scottish Hydro-Electric Transmission Limited (SHETL)

The electricity transmission licensee in northern Scotland

Scottish Power Transmission Limited (SPTL)

The electricity transmission licensee in southern Scotland

Shrinkage

Shrinkage is a term used to describe gas either consumed within or lost from a transporter's system. For example shrinkage can result from gas transmission companies using gas within their transportation systems to fuel gas compressors. Gas leaks from distribution mains are vented by certain types of equipment and shrinkage also occurs when gas is stolen or not charged for in error.

SmartGrid

SmartGrid is an electricity network that can intelligently integrate the actions of all the users connected to it - generators, consumers and those that do both - in order to efficiently deliver sustainable, economic and secure electricity supplies.

Smart Metering

Advanced gas and electricity metering technology that offers customers more information about, and control over, their energy use (such as providing information on total energy consumption in terms if value, not only volume), or allows automated and remote measurement.

Sulphur Hexafluoride (SF6)

A potent greenhouse gas frequently used in electrical equipment

Supply Chain

Refers to all the actors involved in the delivery of electricity and gas to the final consumers - from electricity generators and gas producers, through to electricity and gas suppliers.

Sustainable development

Refers to economic development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Development Commission

The Sustainable Development Commission is the Government's independent advisory body on sustainable development.

Sustainable energy sector

A sustainable energy sector as one which promotes security of supply over time; delivers a low carbon economy and associated environmental targets; and delivers related social objectives (e.g. fuel poverty targets).

System operator (SO)

The entity responsible for operating the GB transmission system and for entering into contracts with those who want to connect to and/or use the transmission system. National grid is the GB system operator.

T

Third Internal Energy Market Package

The third package is a key step in implementation of internal EU energy market. It recognises the need for better co-ordination between European network operators and continuing co-ordination between regulators at that level. It continues many of the internal market principles identified above in relation to the earlier First and Second Packages.

Transmission Access Review (TAR)

Following the publication of the Energy White Paper 2007, Ofgem and BERR have convened a joint review of the current framework for access to the GB transmission system. The review will explore a range of issues associated with the technical, commercial and regulatory arrangements, with the chief aim being to better support the delivery of the government's aspiration of 20 percent of electricity supplied by

renewable generation by 2020 and any targets that may be agreed at European Union level.

Transmission Owner (TO)

There are three separate high-voltage transmission Owners in Great Britain:

National Grid Electricity Transmission plc (NGET) - owns and maintains the high voltage electricity transmission system in England and Wales. They also have the role of system operator (SO) across the whole of Great Britain.
Scottish Hydro-Electric Transmission Limited (SHETL) - the electricity transmission licensee in northern Scotland.
Scottish Power Transmission Limited (SPT) - the electricity transmission licensee in southern Scotland.

National Grid Gas NTS is the gas Transmission Owner.

Transmission System

The system of high voltage electric lines providing for the bulk transfer of electricity across GB.

Transmission Investment for Renewable Generation (TIRG)

In the context of this document, this means the regulatory mechanisms developed before the start of the next main price control in 2007, to fund a number of specific network enhancement projects required to provide transmission capacity for new renewable generation plants.

Traffic Management Act (TMA)

The Traffic Management Act is intended to provide better conditions for all road users through proactive management of the national and local road network.

Transmission Price Control Review (TPCR)

The TPCR established the price controls for the transmission licensees which took effect in April 2007 for a 5-year period. The review applies to the three electricity transmission licensees, National Grid Electricity Transmission, Scottish Power Transmission Limited, Scottish Hydro-Electric Transmission Limited and to the licensed gas transporter responsible for the gas transmission system, NGG.

U

Uniform Network Code (UNC)

As of 1 May 2005, the UNC replaced National Grid Gas' Network Code as the contractual framework for the NTS, GDNs and system users.

Users of the Network

Companies along the gas and electricity supply chain (i.e. producers/generators, transmission and distribution networks, and energy suppliers).

V

Vanilla weighted average cost of capital (vanilla WACC)

The weighted average cost of capital using a pre-tax cost of debt and a post-tax cost of equity.

Vesting assets

Assets included in the RAV at the vesting date.

Visionary phase

The 'visionary' phase of the RPI-X@20 project is the first stage. Here we will aim to understand all the issues affecting energy networks and network regulation, and to identify areas where change may be needed.

W

Weighted average cost of capital (WACC)

This is the average of the expected cost of equity and the expected cost of debt, weighted by the gearing ratio.

Y

Yardstick mechanism

When the regulator uses observations of different firms to deduce their private information and regulate them consequently.

Appendix 6 - Feedback questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

Andrew MacFaul
Consultation Co-ordinator
Ofgem
9 Millbank
London
SW1P 3GE
andrew.macfaul@ofgem.gov.uk