Reckon LLP
Data analysis | Economic regulation | Competition law

Ofgem **22 December 2009**

Longer-term price controls
Paper prepared for Ofgem's RPI–X@20 review

Summary

1. Ofgem is carrying out a review of the way it regulates Great Britain's gas and electricity networks — the RPI–X@20 review. As part of the review, Ofgem asked Reckon LLP to prepare a short paper that identifies potential options, benefits and drawbacks relating to the use of longer-term price controls.

2. Ofgem's existing price controls for companies that operate electricity distribution networks, gas distribution networks and transmission networks were all set for five years. The RPI–X@20 review has identified concerns that setting five-year price controls may lead energy network companies to focus their efforts on their performance within a five-year window. Five-year price controls may not do enough to promote the long-term efficiency of network companies.

3. A commitment to longer-term price controls would give network companies a clear financial stake in controlling their costs over a longer time horizon. This is likely to change the way that the companies plan their activities, anticipate customer needs and innovate. This, in turn, could help the companies to reduce and restrain their costs over the longer term and thereby improve value for money for consumers.

4. Longer-term price controls could reduce the administrative burden of the price control regime. Less work may be required overall if price control reviews are carried out less frequently. Even so, the work at each price control review may be more intensive. Longer-term price controls may also need to be accompanied by regular monitoring of companies' performance between price control reviews.

5. We have considered different options relating to longer-term price controls. Our starting point is the option of extending the length of time between price control reviews (e.g. from five to ten years). Whilst this could bring the benefits highlighted above, there are also a number of potential drawbacks. Two stand out:

   (a) The regulatory regime is likely to be less adaptable. It would be more difficult to makes changes to what network companies are required to deliver and to improve the regulatory arrangements over time.

   (b) The uncertainty faced when forecasting costs over a longer timeframe might increase the risks that network companies find themselves unable to finance their activities; it might also increase the risks that network companies earn what could be perceived as "windfall profits".

Reckon LLP, limited liability partnership registered in England (number OC307897)
20 Theobald's Road, London, WC1X 8PF • Telephone 020 7841 5850 • www.reckon.co.uk

6. For the benefits of a longer-term price control to be realised, it needs to be credible, particularly to network companies and investors. These drawbacks pose some risks to the credibility of a ten-year price control — it might be re-opened before planned.

7. The academic and regulatory literature also suggests that, if the period between price control reviews were extended, there is greater scope for the prices that a regulated company charges to become out of line with its costs. The extent to which this is a concern in the context of Ofgem's regulation of energy networks is difficult to disentangle from other elements of the regime. We argue later in this paper that this concern should not be overstated.

8. We have not come to a view on the likely impact of longer-term price controls on the cost of capital. The cost of capital could be higher or lower. A longer-term price control might expose network companies to greater risks of their costs being much higher or lower than what was expected when the price control was set. But a longer price control also represents a longer period of time over which Ofgem commits to the revenue that a network company is allowed to earn and to the "rules of the game".

9. We have identified further options that involve elements of longer-term price controls. In particular, the following two approaches provide ways to tackle the drawbacks above and to enhance credibility, without undermining the potential benefits from restraining network companies' costs over the longer term:

   (a) A ten-year price control in which there is a scheduled review, after five years, of the outputs a network company is required to deliver and the obligations it faces. Changes would only be made to the revenue the company is allowed under the price control insofar as justified by changes to what it is required from it.

   (b) A ten-year price control with a review of the network company's revenue requirements after five years, in which only 50 per cent of any changes from this updated cost forecast feed through into changes to the revenue the company is allowed under the remainder of the price control.

10. These approaches are described in more detail later in the paper. We use the case of ten-year price controls for illustration. These options could be applied to other combinations of years (e.g. an eight year control, perhaps with a partial review after four years).

11. Another option would be to take a more project-level approach to energy network regulation, in which funding is tied to the delivery of specific projects. This could allow for longer-term funding and incentive arrangements for some projects. It would tend to reduce the importance of the length of time between price control reviews.

12. These options are not without drawbacks and risks, but seem worthy of consideration alongside a more straightforward increase in the length of time between price control reviews. The options we have identified are not necessarily alternatives. For instance, longer-term price controls for some parts of a company's businesses could be combined with greater use of project-level regulation for other parts. The appropriate approach may vary between transmission and distribution and between gas and electricity.

Introduction

13. Ofgem is carrying out a review of the way it regulates Great Britain's gas and electricity networks — the RPI–X@20 review. As part of the review, Ofgem is considering a range of options that could bring a longer-term perspective to energy network regulation.

14. For example, one proposal is to further develop Ofgem's use of innovation funding schemes, to enable energy network companies and other parties to compete for funding for innovative activities that could improve the performance and efficiency of network companies over the longer term. Ofgem is also considering changes to the business plans that network companies prepare as part of price control reviews. The changes are intended to give confidence that companies' proposed approaches reflect planning over a longer time horizon, taking account of a range of future scenarios and based on sufficient consideration of alternative options for delivery.

15. Another development, which could reinforce these measures, is longer-term price controls. Ofgem asked Reckon LLP to prepare a short paper that identifies potential options, benefits and drawbacks relating to the use of longer-term price controls.

16. This paper focuses on the use of longer-term price controls as a way to better encourage network companies to take decisions that reduce and restrain their costs over the long term — beyond the five-year horizon of Ofgem's current price controls. This could, in turn, improve value for money for existing and future consumers.

17. The paper is structured as follows:

    (a) We provide a brief introduction on the length of price controls set by Ofgem and other economic regulators.

    (b) We discuss potential benefits and drawbacks of longer-term price controls.

    (c) We set out and review different options around longer-term price controls, beyond simply extending the length of time between price controls reviews.

18. This paper contributes to the work of Ofgem's RPI–X@20 project team. We were not asked to make recommendations on longer-term price controls. It is not appropriate to take a view on this aspect of the regime in isolation from all of the other aspects that Ofgem is considering.

Price control length

Ofgem's price controls

19. Ofgem's existing price controls for companies that operate electricity distribution networks, gas distribution networks and transmission networks in Great Britain were

all set for five years.[1] Following Ofgem's most recent review, new price controls will be set for electricity distribution companies for a five-year period from April 2010.

20. The main feature of a five-year price control is that the revenue that a regulated company can earn from customers is, in large part, determined in advance to cover a five-year period.

21. The revenue is not fixed in an absolute sense. It can vary according to rules and mechanisms that are set as part of the price control (e.g. to allow the company more revenue the more new customer connections it needs to make). Some of these rules and mechanisms affect the amount of revenue the company can collect during the five-year period. Others lead to adjustments to the amount of money the company will be entitled to earn as part of the subsequent price control periods.

22. There have been variations in the length of price controls set by Ofgem and its predecessors. For instance, before 2001 price controls for electricity transmission were set for three or four years.[2]

Other regulatory precedent

23. Other economic regulators in Great Britain set price controls for between three and five years. Price controls for water and sewerage companies in England and Wales and for BAA's airports are currently set for five years. The appendix provides more information on the length of price controls and highlights reasons given by the regulators concerned.

24. Longer time horizons for regulatory reviews are found, but in different circumstances:

    (a) Ofgem's new regime for offshore electricity transmission involves competitive tenders to appoint a network operator which is then entitled to a revenue stream over a 20 year period, determined by its bid during the tender process. There are some adjustments built into the revenue stream (e.g. performance incentives) but no periodic reviews during the 20 years.[3]

    (b) Ofgem's price controls for independent gas transporters (IGTs) are relative price controls, subject to upper and lower limits set in 2003 for a ten-year period.

    (c) Under the regime for the London Underground public-private partnership (PPP) agreements, the PPP Arbiter may be asked to determine the price at which an infrastructure company delivers the agreed service for the next period of seven and a half years. This is done only if the parties fail to agree and one or both parties request a decision by the Arbiter.

---

[1] Ofgem consulted in October 2009 on the option of an "'adapted roll-over" for the transmission price control, under which the price control ending in April 2012 would be followed by a one-year control, with limited changes from the existing regime, so that a new price control can be set in April 2013 which fully reflects the conclusions of the RPI–X@20 review

[2] For further information on the length of energy network price controls since privatisation see Ofgem (2009) *Regulating Energy Networks for the Future: RPI–X@20 History of Energy Network Regulation*, February

[3] Ofgem/DECC (2009) *Overview of Great Britain's Offshore Electricity Transmission Regulatory Regime: joint DECC/Ofgem statement*, June, pages 20–21

25. We have not sought to carry out a wider review of the length of price controls. A study for the World Bank published in 2003 found that "most international evidence on the length of price controls is between 3 and 5 years".[4]

Potential benefits of longer-term price controls

Long-term efficiency

26. Ofgem's RPI–X@20 review has identified concerns that setting five-year price controls may lead energy network companies to focus their efforts on their performance within a five-year window, and may not do enough for the long-term efficiency of energy networks.[5] Ofgem recognises the importance of network companies taking decisions that restrain costs over the long term as well as the short term.

27. Ofgem's five-year price controls provide direct incentives to encourage network companies to reduce and restrain their costs within the five-year period of the current price control. They do less to encourage network companies to minimise their costs over a longer timeframe. This reflects the following:

    (a) The five-year duration of current price controls represents, broadly, the period of time over which Ofgem commits to refrain from: (i) fully compensating the network company for any cost increases it experiences during that period and (ii) denying the network company the full benefits of any cost reductions it achieves during that period (e.g. by reducing prices to consumers accordingly). This commitment provides the network company with profit opportunities from finding ways to reduce and restrain its costs.

    (b) At the end of the five-year period, a new price control is determined in light of fresh forecasts of the network company's future expenditure needs. The network company faces no guarantee that it will enjoy the benefits of any actions it takes now (e.g. long-term network planning or innovative activity) insofar as these enable it to reduce its likely expenditure requirements, or better serve its customers, beyond the end of the five-year period.

28. This is not to say that, under Ofgem's current regimes, network companies necessarily operate within the confines of a five-year price control. To varying degrees network companies plan their activities over horizons that stretch beyond the five years of a price control. Furthermore, the current regimes offer some protection to consumers against network companies not taking opportunities to improve their practices over time and offer some encouragement to network companies to try to reduce their longer-term costs. For instance, the use of cost benchmarking analysis in setting price controls means that network companies are exposed to financial risks from the possibility of their costs being deemed higher than the "efficient costs" at the next price control review.

---

[4] Alexander, A, A Raza and J Daniel Wright (2003), *KESC's 2002 Multi-year Tariff Determination: Lessons for Pakistan and South Asia*, November, World Bank, page 10

[5] Ofgem (2009) "Delivering a sustainable energy sector and value for money — What do we mean by 'efficiency'?", *RPI–X@20 working paper*, September

29. But longer-term price controls could do more to encourage network companies to take decisions that promote value for money over the longer-term — beyond the five-year horizon of current price controls. For instance, longer-term price controls could:

    (a) Give network companies a greater financial stake in their performance in planning network investment and anticipating customer needs beyond the five-year horizon.

    (b) Allow network companies to keep more of the rewards from innovation that reduces their expenditure requirements beyond the five-year horizon.

30. In addition, longer-term price controls could help reduce the impact of distortions to network companies' decision-making that may arise from fixed-term price controls, particularly as companies approach the end of a price control period. For instance, there are risks that network companies may delay investment projects until the next price control period if they see an opportunity of getting additional revenue allowed for that expenditure as part of the new price control review. These risks would not be eliminated by longer-price control periods, but they would arise less frequently. Similarly, potential distortions to network companies' decisions between operating expenditure and capital expenditure approaches might be ameliorated by longer-term price controls.

31. Extending the length of the price control (e.g. doubling it to ten years) would not solve all the problems associated with the timing of price control reviews. For instance, there may still be stronger incentives for network companies to innovate at the start of the review period than at the end. But it seems capable of achieving improvements, so long as network companies and investors have confidence that the regulator will stick to the longer period.

Other potential benefits

32. Our focus in this paper is on longer-term price controls as a means to promote long-term efficiency. We have identified two further potential benefits:

    (a) **Lower administrative burden**. If periodic reviews are carried out less frequently, there could be a reduction in the administrative burden of the regulatory regime. This would accrue to Ofgem, to networks and other stakeholders. But we recognise that the burden at each review is likely to be greater: more is at stake and the forecasting period longer. More resources might be needed to monitor networks' performance between price controls reviews. There may also be a greater risk of needing to re-open a price control.

    (b) **Lower regulatory risk**. A longer price control represents a longer period of time over which Ofgem commits to the revenue that a network company is allowed to earn and to the "rules of the game". This could contribute to a perception of lower regulatory risk amongst investors and reduce the costs of financing network investment. In turn, this could benefit consumers, by allowing Ofgem to set a lower cost of capital when setting price controls. However, as discussed further below, other aspects of a longer-term regime work in the opposite direction and could lead to higher financing costs.

Potential drawbacks of longer-term price controls

33. Drawing on a review of regulatory and academic literature, we have identified a number of potential drawbacks of longer-term price controls:

(a) **Less adaptable**. A longer period between price control reviews reduces the opportunity for Ofgem to adapt the regulatory regime over time. Adaptation allows for changes in what Ofgem, customers and Government want network companies to deliver under the regulatory regime. It also includes the opportunity to develop and improve aspects of the regime and to address any defects.

(b) **Financeability risks and the cost of capital**. A longer forecasting horizon may increase the risk that a network company's costs are much higher than the revenues it is allowed to collect from customers under the price control. This might bring a greater risk that a network company is not able to finance its activities (depending on the circumstances, Ofgem might need to address financeability problems by re-opening the price control). These risks may also call for Ofgem to set a higher cost of capital.

(c) **Risks of perceived windfall profits**. A longer forecasting horizon may increase the risk that a network company's costs are much lower than the revenues it is allowed to collect from customers under the price control. This could lead to perceptions, perhaps amongst the public and in Government, of network companies making unjustified "windfall profits" — profits that reflect good fortune rather than good management. This could, in turn, reduce stakeholders' confidence in the regulatory regime.

(d) **Greater scope for prices to become out of line with costs**. A potential downside of longer-term price controls that is emphasised in the academic and regulatory literature is that there is greater scope for the prices that the regulated company charges to become out of line with its costs. The extent to which this is a concern in the context of Ofgem's regulation of energy networks is difficult to disentangle from other elements of the regime. We argue in a separate sub-section below that this issue should not be overstated.

(e) **Risks of re-opening price control**. The various problems above could increase the risk that Ofgem re-opens the price control before the scheduled review date. If network companies anticipate such a review, this could limit their incentives to innovate and reduce costs.

(f) **Less frequent use of benchmarking information**. Ofgem uses information from cost benchmarking analysis in setting price controls, particularly in gas and electricity distribution. This can benefit the customers of a network company that is assessed as relatively high-cost (either overall or in specific areas) insofar as part of the price control is set by reference to the costs of lower-cost companies. If price controls are reviewed less frequently, there may be fewer opportunities for customers to benefit in this way.

(g) **Hikes in prices following price reviews**. A longer period between reviews could lead to greater changes to prices when a review does take place. These changes could be upwards or downwards. Large hikes in prices may be unpopular with consumers and could reduce stakeholders' confidence in the regulatory regime.

(h) **Slower feed-through of performance to profit**. Under Ofgem's current price controls, network companies are subject to penalties and rewards against their performance in terms of output delivery and costs. Some of these only feed through to affect companies' allowed revenues at the next price control review. A longer lag between performance and revenue impact may be undesirable if network companies' management teams are motivated by shorter-term profit considerations. This risk could be addressed by assessing performance more frequently and by ensuring that penalties and rewards feed through to profits more quickly.

(i) **More variable work-flow for Ofgem**. Longer price periods between reviews, such as ten years, might bring problems for Ofgem's work-flow (and perhaps also that of regulated companies). There would be longer periods without price control reviews followed by what might be more intensive periods of work. This could make it more difficult to retain skilled staff and to preserve corporate memory. At the same time, a longer period may bring benefits by allowing price control reviews for the different energy network sectors to be further spread out.

34. The use of longer-term price controls would also represent a change not only from Ofgem's current arrangements but also from those of other economic regulators in the UK. There are risks of adverse consequences that are not anticipated.

35. We have not come to a view on the likely impact of longer-term price controls on the cost of capital. We highlight reasons for this in the next sub-section below.

36. We then explain why the potential concern relating to the scope for prices to become out of line with costs should not be overstated.

37. More generally, whether the drawbacks identified above will apply is likely to depend on the precise way in which the length of the price control period is extended, and on other aspects of the regulatory regime. There are likely to be ways of mitigating, at least in part, each of these potential drawbacks. In the final section of this paper, we describe possible options for "partial longer-term price controls" that could mitigate the drawbacks under (a), (b), (c) and (e) above, which seem the most important risks.

We have not come to a view on the likely impact on the cost of capital

38. A longer forecasting horizon may increase the risks that a network company's costs are much higher (or lower) than the revenue it is allowed to collect from customers under the price control regime. This could raise its financing costs — for instance if it finds that it needs to protect itself from these risks by operating with a lower proportion of debt to equity investment. This could lead to the need for a higher weighted average cost of capital when setting price controls which would tend to increase consumer prices.

39. However, it seems wrong to presume that longer price control periods call for Ofgem to use a higher weighted average cost of capital when setting price controls. This is for several reasons.

40. First, Ofgem's current price controls include a range of mechanisms which reduce networks companies' exposure to financial risks. These include the indexation of revenues with the retail price index (RPI), revenue and volume drivers, specific re-openers and provisions for logging up. Concerns about forecasting expenditure requirements over a longer period of time could be mitigated, to some degree, by a greater use of these kinds of mechanisms. Ofgem's RPI–X@20 project team discussed the benefits and drawbacks of such mechanisms in a working paper.[6] The drawbacks include the risks of an evermore complex regulatory regime.

41. Second, the difficulty in forecasting network companies' expenditure requirements over a longer period may be partially offset in two ways:

    (a) Some of the costs that network companies face may be seen to show short-term fluctuations or cyclical patterns. For instance, there may be periods in which wages or the prices of intermediate inputs used by network companies grow quickly (e.g. relative to the RPI) and periods in which these grow more slowly. Making forecasts over a longer period may allow these fluctuations to be smoothed out.

    (b) Network companies face uncertainty as to when things need to be done (e.g. reinforcing part of the network). A ten-year forecast may be less sensitive to some aspects of this uncertainty than successive five-year forecasts, as it is less dependent on forecasting what expenditure is likely to fall before or after the fifth year.

42. Finally, the weighted average cost of capital will reflect the regulatory risk that network companies face. As identified above, investors in energy network companies may feel that longer-term price controls bring less regulatory risk, contributing to a lower cost of capital.

43. An assessment of the likely impact of longer-term price controls on the cost of capital is beyond the scope of this paper. Ofgem would need to take the length of the price control into account, alongside other aspects of the regime, when setting the cost of capital.

The risks of prices becoming out of line with costs should not be overstated

44. In the academic and regulatory literature, the length of the price control period is often taken as the main lever used to control the strength of incentives for a regulated company to reduce its costs. A longer price control provides stronger incentives for cost reduction. But this comes with a downside: there is greater scope for the regulated company's prices to diverge from its costs. The length of the price control

[6] Ofgem (2009) "Delivering outcomes: Ensuring the future regulatory framework is adaptable", *RPI–X@20 working paper*, October

period is often characterised as a trade-off between "productive efficiency" and "allocative efficiency".[7]

45. A related concern is that consumers may have to wait longer before they enjoy the benefits of cost reductions achieved by the regulated company, since there is a longer time lag before lower costs can be reflected in lower prices when the price control is reviewed.

46. The extent to which these should be treated as reasons against longer-term price controls is particularly difficult to disentangle from other elements of the price regime. In the context of Ofgem's RPI–X@20 review these concerns should not be overstated. This is for a number of reasons.

47. First, price controls can be set in light of forecasts of the productivity improvements and cost savings that network companies are expected to be able to achieve over the period of the price control. Anticipated cost savings can be reflected in the prices that consumers face under the price control.

48. Second, both operating expenditure and capital expenditure can be subject to a form of risk-sharing around an upfront expenditure forecast (e.g. the approach Ofgem took for "network costs" in setting price controls for electricity distribution networks for the period 2010 to 2015). For every £1 that a company saves, the saving can be shared between the company's investors (in terms of higher profits) and consumers (through lower prices). Under these arrangements, consumers can benefit from *unanticipated* cost reductions in two ways:

    (a) Through the risk-sharing arrangements, consumers are entitled to share a proportion of cost savings that the company achieves during the price control period. This entitlement can be passed through to consumers either in the form of reduced prices during the price control period or in the form of a rebate that offsets other costs when setting the next price control.

    (b) Consumer prices in the subsequent price control period are set in light of a new, forward-looking assessment of the company's expenditure requirements. This assessment should take account of the cost savings that the company has been able to achieve.

49. If the period between price control reviews were extended, consumers would need to wait a longer period of time before enjoying the benefits under (b). However, if there were concerns that consumers would not enjoy a sufficient proportion of any unanticipated cost savings achieved by the company, these could be addressed by increasing the share of cost savings passed through to consumers under (a); this would weaken incentives for short-term cost savings (e.g. within a five-year horizon).

50. We now turn to the specific concerns from the academic and regulatory literature that longer price controls pose greater risks to "allocative efficiency". These concerns reflect a view that there are inefficiencies in consumption patterns within the economy

[7] See, for example, Coco, G and C De Vincenti (2008) "Optimal price-cap reviews", *Utilities Policy*, 16, pages 238–244

the further prices are from marginal costs of supply, at least insofar as consumption is sensitive to price. If price controls are reviewed less frequently, it is possible that a regulated company's prices may diverge further from marginal costs (or from other measures of cost that might be taken as regulatory objectives).

51. In this context, it is important to appreciate that Ofgem's price control reviews for energy network companies determine constraints on the overall revenues that network companies can earn but do not generally determine the charges for the various services that companies provide their customers. These charges are set through processes that are largely separate from the price control determination. For instance, there are auctions for gas transmission capacity and approval processes for the methodologies that network companies use to set their charges. There are opportunities to update networks' charges between price control reviews, including in light of changes to companies' costs. The length of the price control is not a barrier to these updates.

52. The outcome of the price control review does place a constraint on the charges that can be set through these processes. The total revenues collected from customers through the relevant charges must reconcile with the revenues allowed under the price control. It is conceivable that changing this constraint less frequently might prevent otherwise beneficial updates to charges from being implemented. But a sense of perspective is needed. Other features of the regulatory regime and of industry cost structures mean that, regardless of the length of the price control period, at least some prices may need to diverge substantially from marginal costs (or other cost measures). The impact of longer price control periods may not be material.

Options around longer-term price controls

53. In this section we identify a number of further options around longer-term price controls, beyond simply extending the length of time between price control reviews. We organise these into three categories:

    (a) **Partial longer-term price controls**. Longer-term controls that build in some kind of review, or option for review, before the end of the price control period.

    (b) **Rolling five-year price control**. Under this option, a five-year price control would be set and then updated annually such that the price control covers a five-year horizon that is rolled forward year-by-year.

    (c) **Project-level regulation**. The importance of price control length could be reduced by making more use of project-level controls, which may span a longer timeframe than five years.

54. These options are not necessarily alternatives. For instance, greater use of project-level regulation for some parts of a network company's businesses could be combined with partial longer-term price controls for other parts. The appropriate approach may vary between transmission and distribution and between electricity and gas.

Partial longer-term price controls

55. The previous sections identified benefits and drawbacks of extending the length of time between price control reviews. We have considered how longer-term price controls could be structured in ways that mitigate drawbacks relating to the following:

    (a) **Adaptability.** Less scope to adapt the regulatory regime over time, especially to change what network companies should deliver.

    (b) **Forecasting.** There may be greater difficulty in forecasting costs (including financing costs) when setting a longer-term price control, which could bring greater risks that network companies are unable to finance their activities, greater risks of perceived windfall profits and, in turn, greater risks of re-opening price controls.

56. We have identified four ways in which price controls could be set on a partial longer-term basis. These are set out in table 1. These models represent hybrids between five-year and ten-year price controls. We have used the case of ten-year price controls for illustration. These options could be applied to other combinations of years (e.g. an eight year control with a potential review after four years).

Table 1 Options for partial longer-term price controls

Model	Drawbacks tackled
1) Ten-year price control with review after five years if requested by either the network company or Ofgem	Adaptability and forecasting
2) Ten-year price control with review after five years if the company's actual expenditure is more or less than specified cost thresholds	Forecasting
3) Ten-year price control with cost review after five years in which a proportion (e.g. 50 per cent) of an updated cost forecast for the remaining five years is reflected in the revised price control	Forecasting
4) Ten-year price control with potential review after five years if changes to outputs are needed; price control adjusted only as far as justified by change in outputs	Adaptability

57. Each of these options could be combined with the types of uncertainty mechanisms that already feature within Ofgem's current price controls (e.g. volume drivers and specific re-openers).[8]

58. The second and fourth options might be seen to go some way towards an approach in which price control reviews are carried out "by exception", where certain things change or thresholds are reached.

[8] See, for example, the tools highlighted in Annex 1 of Ofgem (2009) "Delivering outcomes: Ensuring the future regulatory framework is adaptable", *RPI–X@20 working paper*, October

59. We describe these models below. We then compare them in terms of their ability to promote longer-term efficiency, their ability to mitigate the drawbacks above and their likely implications for the administrative burden.

60. These options are not intended to be an exhaustive list of options. We have focused on options that tackle the drawbacks related to adaptability and forecasting.

(1) Review after five years if requested

61. One option would be to set a ten-year price control that contains a provision for a full price review after five years if requested by either the network company or by Ofgem.

62. This is similar to the approach taken towards the start of the regulatory regime for the water and sewerage industries in England and Wales. Ofwat's 1994 periodic review set price limits for the next ten years but contained an option for a mid-term review if either the regulator or the companies made the request for one halfway through the period. This option was taken and a new price control put in place in 1999. Since 1999, Ofwat's policy has been to set five-year price controls.

63. We see little merit in this option. There is a high likelihood that at least one of the parties would request a review after five years. For example, network companies might feel that costs have turned out higher than anticipated and that the price controls should be revised upwards. Conversely, Ofgem might be concerned that price controls are too generous to network companies and should be revised downwards. Furthermore, there might be concerns that, unless a review is carried out, network companies will not deliver the things that Ofgem, customers and Government now want.

64. We suspect that this approach would collapse into a system of five-year price controls. We doubt that the potential benefits of longer-term price controls would be realised.

(2) Review after five years subject to cost threshold

65. Another option would be to set a ten-year price control with a specific provision for a review after five years if the network company's actual expenditure is more or less than specified cost thresholds. The cost thresholds could be expressed in £m or as percentage deviations from some baseline. This model would provide network companies and consumers some protection against forecasting risks.

66. So long as the cost thresholds are not expected to be triggered too easily, this model could bring some of the benefits of longer-term price controls.

67. But this model could also bring new problems that could worsen value for money. If a network company is spending more than expected, and if it knows that there would be a new price control review if its costs were above a certain amount, it may decide that it is better off spending excessively in the short term to trigger a review that could lead to an upward adjustment to the price control. Similarly, if a network company is spending less than expected, and if it knew that there would be a new price control review if its costs fall below a certain amount, it may decide that it is better off

spending excessively in the short term to avoid the risks of a review that could lead to a downward adjustment to the price control.

68. Finally, Ofgem always has the option of re-opening a price control. In doing so, it would need to consider the risks of undermining incentives. But this does not rule out an unplanned review. It is not obvious what would be gained by a mechanistic trigger.

(3) Partial adjustment of price control for updated cost forecast after five years

69. It seems possible to give network companies (and consumers) some protection against the potential forecasting inaccuracies without introducing the problems of the costs threshold approach. We have identified a model in which:

(a) A price control is first set for a ten-year period, in light of a ten-year forecast of the network company's expenditure requirements.

(b) After five years, the regulator makes an updated forecast of the network company's expenditure requirements (and cost of capital) for the remaining five years. The price control is adjusted to reflect 50 per cent of the difference between the initial forecast and the updated forecast in the price limits for the remaining five years.

70. Table 2 provides a simplified illustration of how this model might work. We take a regime in which Ofgem would set price controls based on forecasts of a network company's expenditure requirements over the price control period. We consider what the company's allowed revenue would be under three models:

(a) Ten-year price control for 2010–2020, based on ten-year forecast made in 2009.

(b) Successive five-year price controls, covering the periods 2010– 2015 and 2015–2020, based on five-year forecasts made in 2009 and 2014 respectively.

(c) Partial adjustment model. A price control is set covering 2010 to 2020, based on a ten-year forecast made in 2009. An updated forecast of expenditure requirements is made in 2014. The revenue allowed in the last five years of the price control is set as 50 per cent of the difference between the initial (2009) and updated (2014) forecasts for this period (i.e. the average of these forecasts).

Table 2 Illustration of partial adjustment model

	Regulator's cost forecast		Allowed revenue		
Period	**2009 forecast**	**2014 forecast**	**Ten-year control**	**Five-year controls**	**Partial adjustment**
2010–2015	£100m	–	£100m	£100m	£100m
2015–2020	£100m	£150m	£100m	£150m	£125m

71. The difference between the models illustrated in the table comes in the second five years, 2015 to 2020. Under the ten-year price control, the revenue for this period is £100m, based on the initial forecast for this period made in 2009. Under the five-year price control, the revenue for this period is £150m, based on the updated cost forecast made in 2014. Under the partial adjustment model, the price control is £125m, which is the average of the initial and updated forecasts for this period.

72. The illustration above takes the simple case where the revenue the network company is allowed to earn is a lump sum. Ofgem's current regimes include "revenue drivers", through which the network company is allowed additional revenue according to variations in some dimension of its output (e.g. a fixed amount per new customer connection). Revenue drivers could also be amended on a partial adjustment basis as part of this model.

73. This model can be seen as a form of risk-sharing, between the network company and its customers, of differences between an initial long-term forecast of the company's expenditure requirements and an updated short-term forecast:

    (a) Where the updated forecast is higher than the initial forecast, only half the increase in costs in the updated forecast would be recoverable by the network company.

    (b) Similarly, where the updated forecast is lower than the initial forecast, the network company retains half of the benefit of the cost reduction.

74. This model would give network companies a financial stake in controlling costs over a ten-year time horizon. Less of a stake than under a straightforward ten-year price control but a clear stake nonetheless.

75. Ofgem would need a way to communicate and handle the process of partially revising price controls without being placed under pressure to fully revise them. There may be perceptions of the regime being unfair to network companies or consumers when the revised forecast is made but not fully reflected in adjustments to the price controls. It would be important for Ofgem to make clear that the partial adjustment was a core part of the regulatory package established when the price control was set and that to implement a full adjustment would involve going back on that deal.

76. This is not the only way to reduce network companies' exposure to financial risks under a longer-term price control. As highlighted above, a longer period between price control reviews could be combined with a greater use of the types of uncertainty mechanisms that already feature within Ofgem's current price controls (e.g. revenue drivers and specific re-openers). Nonetheless, the partial adjustment model described here could be less complex, and more effective in reducing risks, than an array of different measures each designed to reduce network companies' exposure to a different source of uncertainty.

77. Different variations on this partial adjustment model seem possible. For instance, another option would involve a ten-year forecast being made every five years. The price control would be partially adjusted every five years, in light of the most recent ten-year forecast. Under this approach, there would be no planned end to the price

control; it would be adjusted every five years on a rolling basis. Some of the potential benefits and drawbacks of a rolling approach to price controls are identified in the sub-section below "Rolling five-year price control", albeit in a different context.

(4) Adjust price control for changes in outputs after five years

78. A potential drawback of a longer period between price control reviews is that it reduces the opportunity for Ofgem to adapt the regulatory regime over time. This adaptation includes changes to reflect developments in what Ofgem, customers and Government want network companies to deliver under the regulatory regime.

79. We have not found a fundamental conflict between the desire to use longer price controls to promote behaviour by networks that is conducive to long-term efficiency and the ability to adapt the regulatory regime.

80. It seems possible to set a ten-year price control and to plan a mid-period review after five years which is focused on outputs. This mid-period review would take a two-stage process:

    (a) First, Ofgem would assess whether any changes are needed to the outputs that the network company is required and encouraged to deliver and the obligations it is required to meet.

    (b) Second, Ofgem would assess the impact (if any) of these changes on the revenue that the network company needs, and revise the price control accordingly.

81. An essential feature of this model is that changes to the price control are not triggered by changes in costs. Where changes to allowed revenues are made, these are driven by changes in outputs. These changes should be the minimum necessary to compensate network companies for increases in requirements — or to compensate consumers where output requirements are reduced.

82. This process would not undermine the incentive properties of a longer-term price control.

83. It may not be straightforward to determine what adjustments should be made to the revenues allowed under the price control where changes to outputs are made. For instance, it may be difficult in some cases to tell whether a change to what a network company is required to deliver should be treated as a clarification — without any need for extra revenue — or as an extension for which extra funding should be made available. But the difficulties do not seem insurmountable, and the amount of work required would still be less than for a full price control review.

84. There are some similarities with Ofwat's IDOK process. Ofwat's price controls include provisions for interim adjustments to a company's price control where there has been a "relevant change of circumstance" (e.g. new or changed legal requirements) for which the impact on costs is above a specified threshold. The adjustments to the price control are targeted on the incremental impacts on costs of the specific changes, without re-opening the whole price control.

85. The model we describe would not provide as much adaptability as five-year price controls, since some elements of the regime — such as the incentive framework for costs — would not be open to change at the mid-period review.

86. There are also risks that, in some cases, it could be difficult to implement changes to a network company's output requirements or obligations without a full price control review, if these changes require consent from the company. It would be important to have assurance, from the start, that there is an effective process for making such changes. This might depend on how the model is applied. For instance, it could be a formal ten-year price control with a limited review of outputs scheduled after five years. Or there could be an initial five-year price control accompanied by a commitment by Ofgem to the level of revenues for the succeeding five-year price control that is subject only to variations justified by subsequent changes in outputs.

87. Finally, it may not be necessary or appropriate to plan when the review of outputs takes place; the timing could be left at Ofgem's discretion. The main thing that is needed is an effective process for the review of outputs that allows for focused changes to revenues insofar as justified by changes in outputs.

Comparison of options involving partial longer-term price controls

88. We now compare the models discussed above in terms of their:

    (a) ability to promote long-term efficiency;

    (b) ability to mitigate the problems of limited adaptability;

    (c) ability to mitigate the problems of forecasting costs; and

    (d) likely implications for the administrative burden.

89. The comparisons are presented in table 3. We make these comparisons by reference to two extremes: a five-year price control and a ten-year price control. All comparisons are relative. For example, a five-year price control ranks worst amongst the models considered for promoting long-term efficiency and for the administrative burden. But this should not be taken out of context; it says nothing about five-year price controls compared to other regulatory approaches.

90. We have drawn distinctions in the table between the models only insofar as possible from the initial review in this paper. Further differentiation might be possible following a more detailed analysis.

91. To make comparisons against the regulatory burden, we have assumed that under the cost threshold model the thresholds are designed so that a review would be a rare event (much less than 50 per cent probability); under this assumption, the burden of this model is closer to that of a ten-year price control than a five-year price control.

Table 1 Comparison of models for partial longer-term price controls

Model	Longer-term efficiency*	Administrative burden*	Adaptability of the regulatory regime	Risks to financeability, of windfall gains and unplanned re-opening
Five-year price control	●	●	○	○
(1) Ten-year price control with review after five years if requested by either the network or Ofgem	●	●	○	○
(2) Ten-year price control with review after five years if the network's actual expenditure is more or less than specified cost thresholds	◐	◑	●	◑
(3) Ten-year price control with cost review after five years in which 50 per cent of an updated cost forecast is reflected in the revised price control	◑	◑	●	◑
(4) Ten-year price control with review after five years if changes to outputs are needed; level of price control adjusted only for changes in outputs	◑	◑	◑	●
Combination of both (3) and (4)	◑	◐	◑	◑
Ten-year price control	○	○	●	●

** Not taking account of risks of re-opening of the price control (right hand column) which will tend to offset benefits to longer-term efficiency and increase the administrative burden*

92. Table 3 does not take full account of the interactions between the different criteria. If we leave aside the risks of re-opening the price control before scheduled, a ten-year control is capable of providing strongest incentives for network companies to reduce and restrain their costs over the longer term. However, incentives will be affected by companies' and investors' perceptions about the risks of re-opening. Especially given the lack of UK precedent for price controls longer than five years, there are risks that a ten-year price control would not be perceived as likely to stand without a re-opening, which could offset its incentive benefits. The third and fourth models allow for a managed adjustment process after five years, which reduces the risks of an unplanned re-opening; these models could provide stronger longer-term incentives overall.

93. The models discussed above are not necessarily alternatives. This is reflected in table 3, which highlights the possibility of combining a model involving partial adjustment of price controls in light of an updated cost forecast with provisions for price controls to be (fully) adjusted as necessary for changes in outputs requirements.

Rolling five-year price control

94. An alternative approach to longer-term price controls is the use of a rolling price control. For illustration, we have selected a rolling price control covering five years, but the idea could be applied to shorter or longer periods.

95. Under this option, a five-year price control would first need to be set. Towards the end of the first year, a review would be undertaken to establish price limits for year six, extending the price control by an extra year. Rather than having four years left of a five year price control, the network would still face a price control fixed for the next five years. The process would be repeated annually, so that a price control covering a five-year horizon rolls forward over time. This idea comes from a paper by Welsh Water, submitted as part of Ofwat's consultation on the length of the price control period in 2006.[9]

96. This approach could contribute to the long-term efficiency of network companies. It would remove the "periodicity" of current price controls, in which network companies may face stronger incentives to cut costs in the early years of a price control than in the later years. More generally, it could help address concerns about short-termism in companies' decision-making. Currently, network companies face a price control that covers a shorter and shorter period as the next periodic review approaches. Under the rolling five-year price control, network companies would always face a price control covering the next five years.

97. The annual process would mean more regular setting of price controls. This would bring less of a strain on resources than five-year price controls and more continuity to the regulatory process.

---

[9] Annett, N and J Liesner (2006) "The case for Rolling Price Reviews in the Water Industry", in *Welsh Water Appendix Responses to Ofwat consultation "Setting water and sewerage price limits: Is five years right?"*, August

98. However, this approach has some serious drawbacks. After an initial period of five years, the rolling price control would be made up of a series of forecasts which would each have been made five years before the year which they concern. These forecasts seem likely to be less accurate than a forecast made to cover the next five years.

99. Furthermore, it may be difficult to forecast capital expenditure requirements over the new time horizons. Rather than being able to plan what is needed over a five-year period, with some flexibility as to when things are likely to be needed within this period, capital expenditure requirement must be forecast a year at a time.

100. Rolling price controls would also suffer from less adaptability than under current arrangements, and perhaps less than under a ten-year price control. Since price limits would always be set five years in advance, it is not straightforward to make changes to what the network company is required to deliver. Ofgem would either need to wait five years or make unplanned adjustments to price controls that have already been set. And since there is no natural end-point to the price control, it may be more difficult to make incremental improvements to the price control regime over time.

101. Finally, the rolling price control might create larger risks than current arrangements of unplanned re-opening of the price control. The annual review process is meant to be focused on setting the revenue for an additional year, five years ahead. But there might be pressures to make adjustments, as part of that review, to the revenues that have already been set for the next four years.

Project-level funding arrangements

102. Our final option represents a different kind of approach. The importance of the price control length could be reduced by making more use of project-level funding and incentive arrangements that are, to varying degrees, outside the process of fixed-term price controls.

103. A distinction can be drawn between two ways to make funding available to a regulated network company:

(a) Funding for delivery of a set of outputs and the performance of a set of functions over a specified period of time.

(b) Funding contingent on delivery of a specific project (or project milestones). The funding arrangements might include penalties for late delivery, but it is delivery rather than the passage of time that drives the funding that the company receives.

104. The first category is most reflective of Ofgem's historical approach to the regulation of energy network companies, in which price controls are set for a period of five years, based on an assessment of companies' required expenditure over that period.

105. The second category allows for regulation of parts of a network company's business in a way that is not tied to a process of periodic price control reviews at fixed intervals. The funding and incentive arrangements for specific projects can be determined outside of the price control review and set to span a period that stretches beyond the end of the current price control.

106. The current transmission price control began in 2007 and will run to 2012. Ofgem has recognised that the current price control arrangements do not do enough to address grid-related barriers to low carbon or renewable generators. This is a particular concern in the context of the UK's need to meet the EU's 2020 renewable energy targets. To remedy this, Ofgem is proposing to provide additional funding to a set of specified transmission projects, outside the revenue allowances in the current price controls.[10] This is an example of a project-level approach outside the context of the main price control review.

107. Another example of elements of a price control being set outside the five-year review process is that of the revenue drivers for gas transmission entry and exit points triggered by capacity auctions. These revenues drivers provide National Grid Gas with additional revenue for releasing incremental entry or exit capacity at the relevant points. The current transmission price control includes revenue drivers for entry and exit points that existed, or were anticipated, at the time that the price control was set. Since the price control was set, Ofgem has determined revenue drivers for additional points that were not anticipated at the price control review.[11]

108. An example of project-level funding arrangements from outside the energy sector can be seen in the construction of Terminal 5 at Heathrow Airport. The Civil Aviation Authority tied parts of BAA's future revenue to the completion of certain milestones in the construction of Terminal 5. These milestones needed to be reached at certain dates or to avoid penalties. For example, by the end of March 2005, BAA needed to have diverted certain rivers in order to unlock the associated revenue from this task.[12]

109. As highlighted above, fixing a network company's revenues over a longer period of time could contribute to long-term efficiency and value for money. The project-level approach would allow the revenue for specific aspects of network delivery to be fixed over a longer period, whilst maintaining a five-year price control arrangement for the remainder of the company's activities. If they are designed well, the project-level funding and incentive arrangements could secure value for money in the delivery of each project.

110. However, a project-level approach may bring its own risks to value for money. In some cases there may be a danger of regulation being more focused on inputs than outputs. Network companies may not be adequately encouraged to plan and adapt the mix of projects that they carry out.

111. This is best explained by example. Suppose Ofgem agrees with a network company that it should carry out projects A, B and C. Ofgem can arrange funding and incentive arrangements that encourage the company to deliver each of these projects efficiently. Now suppose that an alternative project D then comes to light that could replace projects B and C and lead to delivery of what Ofgem and customers want at a lower overall cost. The project-level approach may tie the network to doing A, B and C, missing the benefits of project D. This risk is not eliminated by allowing flexibility

[10] Ofgem (2009), *Transmission Access Review - enhanced transmission investment incentives: initial proposals*, November
[11] See, for example, Ofgem (2009) *Determining revenue drivers for entry and exit points: Canonbie and Gilwern*, April
[12] CAA (2003), *Economic Regulation of BAA London Airports, 2003 – 2008: CAA Decision*, February

for Ofgem and the company to agree variations to the plans. Without a direct profit incentive, the company may never discover, or at least reveal, the opportunity of doing project D instead.

112. It is likely that measures and processes can be developed to tackle the risks associated with a greater use of project-level funding arrangements in the regulation of energy networks. A full review of the opportunities for a more project-level approach to energy network regulation is beyond the scope of this paper. Our main point is that such a move would suppress the importance of the length of time between formal price control reviews.

Appendix 1: duration of price controls in Great Britain

Example	Quote from regulator
Ofwat 2009 periodic review of England and Wales water and sewerage charges Five years	"The five-year cycle represents an appropriate balance between stability and incentives, and the need to be flexible to changing circumstances. The five-year cycle also has the advantage of being well understood and established." Ofwat (2006), *A sustainable water industry — to PR09 and beyond*, October page 12.
ORR 2008 periodic review of Network Rail charges Five years	" … five years is generally considered to be long enough to provide appropriate incentives on companies and certainty to customers and funders, but also short enough to reflect difficulties in forecasting key elements of the review (e.g. expected costs) without needing to build in excessive financial surpluses to accommodate risk or make excessive use of interim reviews." ORR (2006), *Periodic review 2008 (PR08): the treatment of risk and uncertainty*, September, page 10.
Competition Commission, Heathrow and Gatwick 2008 airport charge review Five years	"By setting a price cap for five years, rather than setting airport charges to ensure they cover costs and no more than a specified rate of return, BAA is given the incentive to outperform in that period, by, for example, delivering the required service at lower cost than had been forecast in the price determination." Competition Commission (2007), *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, September page 23.
Ofcom 2009 review of BT leased line charges Three years on this occasion, but express preference for four years	"We generally think that four year period would strike the right balance between providing sufficient incentives on BT and ensuring consumers enjoy the benefits of those efficiency gains." Ofcom (2009), *Leased Lines Charge Control — a new charge control framework for wholesale traditional interface and alternative interface products and services*, July, page 33.
PostComm 2006 Royal Mail Price Control Three years (recently rolled over for one more year)	"Want Royal Mail to have a strong incentive to make efficiency savings, but need to take account of market uncertainty as competition develops." PostComm (2004), *2006 Royal Mail Price Control Review – Stakeholder Workshop*, November, page 8.
WICS review of Scottish Water charges Five years	NB Length of the price control not at discretion of the regulator, but is set by Scottish Ministers. Previously four years, but extended to five years after recommendations from WICS.