

Agenda

Advancing economics in business

Will distribution network operators invest what is needed?

Ofgem, the GB energy regulator, has presented the recently completed review of electricity distribution price controls (DPCR5) as ‘investment-led’. Tim Tutton, Senior Adviser at Oxera, examines whether DPCR5 is likely to lead to the levels of network investment necessary to ensure network reliability and to facilitate delivery of broader government energy policy goals. He concludes that it *will* lead to rising network investment but, because of the strong financial incentive not to invest at the margin, may still lead to under-investment

Prior to 2004 (and the fourth electricity distribution price control review, DPCR4), energy regulators in Great Britain headlined the price reductions resulting from their price control determinations. Since DPCR4, and before DPCR5, Ofgem has highlighted the increases in network capital expenditure (CAPEX) that it was making allowance for. The regulator’s Final Proposals for DPCR5¹ marked a self-proclaimed synthesis of these two approaches, with its press release of December 7th 2009 entitled ‘Regulator sets tough investment-led price controls on regional electricity networks’.

This article examines the issue of just how friendly to network investment is the regulatory regime put in place by the DPCR5 proposals. It concludes that DPCR5 should lead to rising investment in electricity distribution networks, not least because:

- the potential *average* returns to being a distribution network operator (DNO) look attractive in the DPCR5 period;
- CAPEX ‘allowances’ in DPCR5 will be well above forecast actual CAPEX during the DPCR4 period;
- companies need to spend somewhere not too far below their CAPEX allowances, effectively as part of the cost of being in the business of being a DNO (with what constitutes ‘not too far below’ likely to vary somewhat between the companies).

However, a regulatory environment in which companies will want to invest more in their networks than they have recently done co-exists with a strong financial incentive *not to invest at the margin*. In DPCR5, the *marginal* rate of return on investment will be low or negative, at least before taking account of any financial

benefits which such investment might yield via the various output incentive schemes implemented for customer service, quality of supply and distribution losses.

This conflict between (a) an overall regime which is intended to support rising network investment, and (b) a notably strong financial incentive *not* to invest at the margin, will place unprecedented pressure on Ofgem’s ability to ‘police’ networks’ delivery, at least if the aim is for network investment to be what is required, rather than just in the same ballpark.

To justify this conclusion, the following sections cover in turn:

- the existing (DPCR4) incentives to invest in electricity distribution networks;
- the weaknesses which Ofgem perceives in the DPCR4 framework and which it has tried to remedy in DPCR5;
- those aspects of the DPCR5 price control regime that bear most directly on future network investment;
- the question of whether DNOs will spend what is needed on their network to maintain reliability and deliver the broader energy policy goals which the government continues to set.

Existing incentives to invest in electricity distribution networks

A previous *Agenda* article suggested that, under the existing energy network regulatory regimes (put in place between 2004 and 2007), the incentives to invest are determined by the balance of the following main elements:²

The views expressed in this article are those of the author.

- the extent (and sign) of any difference between a network company's actual cost of capital and the cost of capital assumed in setting the relevant price control;
- the allowance for CAPEX embedded in the price control;
- processes and mechanisms—notably, the Information Quality Incentive (IQI)—for encouraging companies to make accurate estimates of the amount of CAPEX required over the following price control period;
- a financial incentive, as part of the IQI, to spend less than the CAPEX allowance embedded in the price control;
- incentives with respect to network 'outputs'—for example, the incentives on DNOs to reduce the volume and duration of supply interruptions.

As far as DNOs are concerned, the major *regulatory* issues that inform a company's decision on whether to undertake a particular investment programme include:

- the need to meet overall licence obligations, not least the obligation to develop and operate an efficient network;
- the desirability of not totally discrediting CAPEX forecasts that the company will have made at the previous price review;
- the marginal rate of return to the investment in question.

The last of these is not straightforward and comprises, at the very least, the following.

- The weighted average cost of capital (WACC) embedded in the current price control (4.8% post-tax, real for DPCR4) and expected for future price controls over the regulatory depreciation life of the assets in question (currently 20 years).
- The extent to which the investment might boost returns under one of the existing *output* incentive schemes (by, for example, reducing network interruptions or losses on the network).
- The 'IQI incentive rate', which is the proportion of any under-spend against the CAPEX allowance in the price control which the company retains (or the proportion of any over-spending which the company loses).

The effect of this last factor works as follows.

- If a company has an incentive rate of, say, 34% (the average of the actual DPCR4 incentive rates, which vary between 29% and 40%), then it retains 34% of any under-spend against Ofgem's CAPEX allowance

or is penalised to the extent of 34% of any over-spend against the allowance.

- A company contemplating a £100m network investment, which would reduce (but not eliminate) an under-spend, would need to factor into the internal rate of return on that investment the fact that it will forgo the £34m 'reward' that it would otherwise receive for not spending the money. Similarly, a company contemplating whether to exceed its CAPEX allowance by £100m would need to factor in the £34m penalty which would result from this (both reward and penalty being expressed in net present value terms).

As noted, it could be anticipated that this expected return is boosted by expected returns under output incentive schemes. However, and assuming that a company's actual cost of capital is at least close to the WACC assumed by Ofgem, what this all implies is that, at the margin, when a company is considering whether, for example, it needs to spend 90% or 95% of its price control allowance, the *direct financial incentives* on an electricity distribution network are likely to be to *not* incur the marginal investment in that network, a point acknowledged by Ofgem in DPCR5 (see below).

What has Ofgem tried to achieve with DPCR5?

During the course of the DPCR5 review, Ofgem identified various weaknesses with the DPCR4 settlement which it has sought to correct.

- Ofgem believes that DNOs, as a whole, earned high returns, but also that much of those returns had little to do with actions taken by the companies themselves. These 'unearned' returns include those returns that several DNOs made under the losses incentive and through being able to borrow more cheaply than Ofgem had assumed.³
- The regulator has accepted that the DPCR4 control contains no effective mechanism to counter the acknowledged strong *direct financial* incentives to not invest in networks (as identified above).⁴ Part of the problem has been that the 'regulatory contract' embodied in DPCR4 is incomplete, particularly in the specification of measurable outputs (including those in relation to the underlying health of network assets) that companies are expected to deliver. Ofgem has therefore had little basis for discriminating financially between companies that have under-spent against price control, while delivering the required outputs, and those that have saved money simply by not delivering the outputs.

- Ofgem has stated that it is not satisfied with the different incentive rates which apply to reducing operating expenditure (OPEX) and to reducing CAPEX (effectively 100% for OPEX, compared with 29–40% for CAPEX), and believes that these differential incentives have over-encouraged companies to adopt capital-intensive solutions.⁵

Its objectives for DPCR5 have thus been, among other things, to:

- ensure that companies that earn the highest rates of return are those that deliver best value to customers;
- provide a strong incentive on companies to maintain the underlying health of their networks (alongside financial incentives to spend less than the assumed allowances on those networks);
- eliminate or, at least, mitigate the regulatory incentive on companies to prefer CAPEX solutions to OPEX ones.

What does DPCR5 offer in respect of network investment?

As noted above, the main regulatory influences on a DNO's investment decisions are currently:

- the regulatory allowances embedded in the price control, combined with the desirability for the company of maintaining some credibility for its forecasts of spending requirements;
- what outputs the DNO is required to deliver;
- the marginal rate of return on the investment needed to deliver those outputs.

To these, and in respect of DPCR5, needs to be added Ofgem's move towards equalisation of incentives to reduce OPEX, on the one hand, and CAPEX on the other. Each of these issues is analysed for DPCR5.

Allowances

Ofgem *has* assumed a substantially higher level of network investment in setting DPCR5 price controls (£6,550m in 2007/08 prices) than DNOs are currently forecast to spend in DPCR4 (£5,341m).⁶

Required outputs

One of the problems with the DPCR4 regime is the lack of specificity (and quantification) about what DNOs are meant to be delivering. Ofgem's DPCR5 proposals try to address this by being both more explicit and detailed about:

- what each DNO is required to deliver, particularly in relation to asset health and network capacity;
- the potential financial consequences of not delivering these outputs.⁷

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As regards these consequences, Ofgem's proposal is that, at DPCR6, it will review whether a DNO has delivered its outputs. To the extent that it is judged to have fallen short, the value of the shortfall (the 'network outputs gap') will be subject to a higher incentive rate than the company's IQI incentive rate, and this will be set against whatever the company might otherwise have received through the IQI incentive. In principle, this would make it unprofitable for a company to choose to reduce costs at the expense of delivering agreed outputs.

Marginal rate of return on network investment

The direct marginal return on CAPEX in DPCR4 is much lower than the average rate of return because of the IQI mechanism. However, the marginal return in DPCR5 is much lower than for DPCR4. This is for the following reasons.

- Without taking account of any benefit from improved performance against output incentives, the marginal rate of return is determined by the interaction between the assumed WACC and the IQI incentive rate.
- The WACC assumed for DPCR5 (4% post-tax, real) is significantly lower than the DPCR4 WACC (4.8% on the same basis).
- The IQI incentive rates are higher—an average of 47%, compared with an average of 34% for DPCR4.

Therefore, in DPCR5, for every marginal £1m of CAPEX or OPEX covered by the IQI mechanism (ie, the overwhelming majority of DNO spend), the average DNO loses £470,000 profit which it would otherwise receive. Thus, if a company targets spending, say, 90% of its IQI allowance—on the basis that this would enable it to deliver its required outputs (and on the basis that the shortfall against 100% could be rationalised convincingly at DPCR6)—and then considers whether it should spend 95% of its allowance (perhaps in light of new information about the condition of its assets), then the finance director will need an awful lot of convincing that bad things will happen without spending the money.

Equalisation of incentives between CAPEX and OPEX

In DPCR4—and in all preceding distribution price controls—DNOs have had an incentive to incur CAPEX, rather than OPEX, in dealing with any particular network problem. Ofgem has, at the very least, substantially reduced this incentive in DPCR5. This has been achieved by:

- broadly lumping all spend (OPEX and CAPEX) into one IQI ‘pot’, apart from ‘business support costs’ (corporate overhead functions) and ‘non-operational CAPEX’ (eg, IT and vehicles);
- then, for revenue-setting purposes, deeming that 15% of this pot should be ‘fast’ money (ie, treated as OPEX was previously) and that 85% of the pot should be ‘slow’ money (ie, added to a DNO’s regulatory asset value or, in other words, treated as CAPEX was previously).

Thus, a company’s choice between incurring OPEX or CAPEX within the IQI pot of costs has no effect on how that spend will be treated for revenue-setting purposes. Any IQI spend ends up facing the IQI incentive rate for that company.

Will DNOs invest what is needed in electricity distribution networks?

In several respects, DPCR5 justifies Ofgem’s claim that it is ‘investment-led’.

- Ofgem has allowed for substantially more CAPEX in DPCR5 than companies are forecast to spend in DPCR4. Other things being equal, companies will be cautious about spending significantly less than Ofgem has allowed (which was, on average, around 12% less than companies requested) because this would reduce future credibility of their forecasts. Therefore, higher allowances should mean that more investment is undertaken.
- Ofgem has, more clearly than before, specified the outputs that DNOs are expected to deliver in return for the allowed revenue, and has also set out, at least at a high level, how companies would be penalised for failing to deliver the required outputs. At least in principle, this constitutes a more substantive counterweight (than in DPCR4) to the financial incentive not to spend money.
- Despite the lower WACC and higher IQI incentive rates, Ofgem suggests in the DPCR5 Final Proposals that the prospective *average* (as against the marginal) returns are enticing. This is, in part, because of the IQI mechanism (both the ‘additional income’ embedded in the mechanism and the extra profit that would be earned from a plausible under-spend against IQI allowances), and because of the scope to earn extra revenue through the variety of output incentive schemes. Ofgem suggests that a ‘plausible’ upside return on regulatory equity⁸ would be between 10% and 13%.⁹ Thus, to the extent that spending close to regulatory allowances is viewed simply as part of the cost of being in the business of electricity distribution—and this is seen as an adequately profitable business (and all companies

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have accepted Ofgem’s proposals)—then a higher level of investment than in DPCR4 can be expected.

In addition, the equalisation of incentives, as between OPEX and CAPEX, should encourage companies to adopt an efficient mix of capital-intensive and non-capital-intensive solutions to network problems.

However, against these pluses for spend on electricity distribution networks should be set:

- the very low *marginal* rate of return on investment, implying that, at that margin, companies will have a strong financial incentive not to invest;
- the fact that the new ‘outputs’ regime is at an early stage, with significant scope for subjectivity and self-assessment by companies in judging whether required outputs have been delivered.

What this implies overall is that:

- investment in electricity distribution networks will be higher in the DPCR5 period than during DPCR4;
- even more than before, companies have a strong incentive to ‘under-cook’ that investment at the margin. If Ofgem’s assessment of what is required is approximately correct, the overall regulatory regime strongly encourages companies to spend less than what is required.

Will DPCR5 lead to the investment required to maintain network reliability and deliver the broader decarbonisation goals included in the government’s evolving energy policy? The answer to this probably depends on whether, given the difficulty of getting network investment exactly ‘right’ (certainly in an *ex post* sense), the regulator should be aiming for slight over-investment or slight under-investment. The public policy argument for the former has always been that network costs are a relatively small part of the total costs of delivering electricity to consumers and that the costs of network failure are high—and, therefore, any deviation of actual investment from the theoretical optimum level should be on the upside. However, the strong marginal financial disincentive to invest which is embedded in DPCR5 means that companies are encouraged to err on the downside, albeit that the desire to maintain credibility with the regulator should prevent that deviation from being substantial.

Thus, *at the margin*, DPCR5 is very much about the ‘stick’ of network outputs—and the associated penalties for not delivering the specified outputs—rather than about the ‘carrot’ of attractive financial returns. This implies that Ofgem has put itself under rather more pressure to ‘police’ marginal network investment than has been the case even for DPCR4—let alone for previous (pre-IQI) price controls when the marginal

financial incentives were to delay capital spend to the end of a price control period, rather than not to incur the spend at all.

It is for consideration whether Ofgem's evolving regulatory reporting regime will be up to the task of providing adequate information for this enforcement role. General regulatory experience suggests that, when companies have a strong financial incentive not to do something, they will usually be smarter than regulators in achieving this aim.

The conclusion of this article is, therefore, that DPCR5 will lead to rising investment in GB electricity distribution networks. It will, however, also probably lead to companies spending somewhat less than Ofgem thinks is required (as embedded in the price control allowances) and, maybe, less than the companies think they really ought to be spending from a public interest point of view.

Tim Tutton

¹ Ofgem (2009), 'Electricity Distribution Price Control Review Final Proposals', December 7th.

² Tutton, T. (2008), 'Investment in Energy Networks: Has Ofgem Got it Right?', *Agenda*, January. Available at www.oxera.com.

³ Ofgem (2008), 'Electricity Distribution Price Control Review Policy Paper', December, paras 1.26–1.31.

⁴ *Ibid.*, para 1.37.

⁵ *Ibid.*, paras 1.51 and 4.56–4.62.

⁶ Ofgem (2009), 'Electricity Distribution Price Control Review Final Proposals: Allowed Revenue Cost Assessment', December 7th, Table 3.1.

⁷ Ofgem (2009), 'Electricity Distribution Price Control Review Final Proposals: Incentives and Obligations', December 7th, Chapter 19.

⁸ 'Regulatory equity' is defined by Ofgem as regulatory asset value (RAV) minus *assumed* net debt. Ofgem's assumption in DPCR5 is that net debt is 65% of RAV.

⁹ Ofgem (2009), 'Electricity Distribution Price Control Review Final Proposals', December 7th, para 4.12.

If you have any questions regarding the issues raised in this article, please contact the editor, Dr Gunnar Niels: tel +44 (0) 1865 253 000 or email g_niels@oxera.com

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