Electricity Distribution Price Control Review

Regulatory Impact Assessment for distributed generation and structure of distribution charges

March 2004

Summary

This document sets out the Regulatory Impact Assessment (RIA) for the introduction of a new incentive scheme for electricity distribution network operators (DNOs) in respect of distributed generation and the proposed framework for the structure of electricity distribution charges. The RIA sets out the expected costs and benefits from introducing the incentive scheme and the revised charging arrangements for the three main parties affected:

- DNOs;
- distributed generators; and
- consumers.

The RIA concludes that any potential costs (or negative impacts) of the proposed arrangements do not outweigh the potential benefits that would be realised.

The arrangements will also help to reduce barriers to entry for distributed generation, and thus are expected to help facilitate the achievement of the Government's environmental objectives at lower network cost than would otherwise arise, through improving the efficiency of connection to and use of the distribution networks.

At the end of the price control review, as part of its final proposals, Ofgem will produce a final RIA for the price control as a whole.

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1. Introduction

Regulatory Impact Assessments (RIAs)

1.1. Ofgem is required to produce RIAs by the Sustainable Energy Act (SEA) which amends the Utilities Act 2000.

1.2. The SEA introduces a new section 5A to the Utilities Act which requires the Authority to carry out an RIA or publish the reasons why it considers that an RIA is unnecessary before implementing its proposals:

- whenever it proposes to do anything for the purposes of, or in connection with, the carrying out of any function exercisable by it under or by virtue of Part 1 of either the Electricity Act or the Gas Act; and
- where it appears to it that the proposal is 'important'.

1.3. Ofgem considers that policy decisions are important if they are likely to lead to significant costs and/or benefits for consumers; if they are likely to result in significant transfers between consumer 'groups'; and if they represent a significant change in Ofgem's approach to carrying out its functions. Where appropriate, Ofgem will produce an RIA for new policies introduced as the price control review progresses.

1.4. Where possible the costs and benefits will be quantified although it should be recognised that this might not be possible in all cases.

Ofgem's statutory objectives

1.5. Ofgem's principal objective as set out in the Electricity Act 1989 as amended by the Utilities Act 2000 is to protect the interests of consumers (present and future), wherever appropriate by promoting effective competition. The Electricity Act also sets out other important duties for Ofgem[1], including:

- securing a diverse and viable long-term energy supply;

[1] See sections 3(A) – 3(C) of the Electricity Act 1989 as amended by the Utilities Act 2000

- ensuring that licence holders are able to finance their statutory and licensed obligations;
- having regard to the effect on the environment of activities connected with the generation, transmission, distribution or supply of electricity; and
- having regard to the interests of individuals who are disabled or chronically sick, of pensionable age, living on low incomes, or residing in rural areas.

1.6. Ofgem also must have regard to the guidance provided to it by the Secretary of State on social and environmental issues.

1.7. The policies outlined in this document and the RIA have been developed against the background of Ofgem's statutory objectives.

2. Regulatory impact assessment for distributed generation and structure of electricity distribution charges

Introduction

2.1. The purpose of this RIA is to assess the impact of the proposed regulatory arrangements in relation to distributed generation (DG) that are due to be implemented as part of the price control for the electricity distribution network operators (DNOs) from April 2005 and the proposed framework for the structure of electricity distribution charges.

2.2. These proposals have been progressed under two parallel strands of work, but they are integral parts of a regulatory policy aimed at reducing barriers for the development of DG. Whilst each is focused on a specific area and addresses different detailed issues, the proposed mechanisms are linked, and need to be seen together in assessing the overall regulatory impact. A separate RIA has been produced for the related arrangements for registered power zones (RPZs) and the innovation funding incentive (IFI).

2.3. Previous documents on the DNO price control review and on the structure of charges[2] have set out Ofgem's initial thoughts for developing the RIA and sought views from respondents on a number of questions. This RIA brings this work together although interested parties should refer to the relevant documentation if they require further details on these policies.

Objectives and key issues for these policies

2.4. The objectives of the proposed regulatory frameworks for DG incentives and for the structure of distribution charges are to:

- remove barriers in the connection to and use of distribution systems; and

[2] "Electricity distribution price control review - 2nd consultation", December 2003; "Structure of electricity distribution charges - initial decision", November 2003

- provide appropriate incentives to DNOs to connect and utilise DG in an economic, efficient and co-ordinated way, including responding in a positive and proactive way to connection requests.

2.5. As explained above, these objectives need to be seen within the context of Ofgem's statutory objectives and in particular the need to protect the interests of consumers.

2.6. The key issues that have been considered in developing these policies are set out in the relevant consultation documents and include:

- designing a scheme for the connection of DG that takes account of the uncertainty surrounding both the expected cost and penetration of DG whilst maintaining incentives to connect efficiently and quickly; and

- ensuring that DG does not face unnecessary barriers to entry to connect to distribution systems because of the structure of charges whilst ensuring that, where possible, costs are borne by those that give rise to them.

Options

2.7. The broad options for the price control arrangement relating to DG are:

a) "Do nothing" – no special treatment or incentives are given to the costs relating to DG, as costs for connecting DG continue to be charged on the principle of deep charging; or

b) "DG incentives" – incentives are provided in various areas of activities in relation to DG: access to the network including reinforcement and operating the network. The approach identified is a hybrid mechanism combining a pass-through element and incentive payments (£/kW) for the connection of DG capacity to the network and an incentive based on network availability.

2.8. The broad options for the charging regime for DG are:

a) "Do nothing" – keep the current deep connection charging mechanism where DG pays all of the costs of connection upfront;

b) "Phased revision to the framework for distribution charges" – implement a common connection charging boundary for both generation and demand customers, which is defined on shallowish principles where the connecting party not only pays for the connection assets but also a proportion of reinforcement work which may be incurred; implement, in the interim, a simple generation use of system charge for new DG which will be voltage varying, capacity based and where appropriate varies with location; in the longer term tariff models will be developed further to provide use of system charges for both demand and generation based on forward looking long-run incremental costs; or

c) "Full implementation of new framework for distribution charges" – implement a common connection charging boundary as in the phased revision option above; implement from April 2005 a use of system charge for all demand and generation based on forward looking long-run incremental costs.

2.9. An earlier consultation document[3] has ruled out Option c) above as a viable option for the charging regime. This RIA assesses the regulatory impact of the introduction of the proposed arrangements – both Options b) – for the incentive scheme for DG and the revised charging structure.

2.10. It is not plausible to adopt one of these two policy options and retain Option a) for the other for the following reasons:

- DG incentives with deep connection charges - generators would, by definition, pay all costs incurred by the DNO (i.e. effective pass-through, subject to negotiation and potential determination). This would not leave any costs for the DG incentive to apply against. Deep charges do not provide incentives to the DNOs to operate efficiently or respond proactively to requests for connection. Some respondents have suggested that there should be a £/kW incentive paid for by demand customers. Ofgem does not consider that this would be consistent with its statutory duties;

[3] "Structure of electricity distribution charges – initial decision", November 2003

- Shallower connection charges and no DG incentives - shallower connection charges require some mechanism for cost recovery by the DNOs and therefore cannot be introduced without changes to the price control. Other potential changes to the price control, such as setting a total revenue allowance, pass-through, or a revenue driver incentive alone, have been rejected in the course of the consultation.[4]

Views of interested parties

2.11. Those respondents that commented on the draft RIAs for the DG incentive and the structure of charging were generally supportive of the work already done, and welcome the development of further details.

2.12. Some respondents commented that provided that the DG incentive is high enough, it would encourage the DNOs to improve efficiency, which in turn would increase DG volumes to be connected. Some other respondents felt, however, that any impact could be marginal over the next price control period, but significant after 2010 when available capacity for connecting DG reduces. One DNO felt that the current proposal was not sufficient to encourage long term strategic investment, but instead would lead to incremental investment with a higher system cost, which could result in a barrier to DG development.

2.13. Some respondents suggested that the costs to customers could increase either due to higher overall cost or due to exceptional circumstances such as DG assets becoming stranded. With regards to price signals to the customers, there was concern that demand customers were unlikely to change their behaviour significantly unless considerable pricing signals were visible to them. In general, the impact on quality and security of supply was considered negligible, especially when there were only small volumes of DG. Some respondents pointed out that wider social and environmental aspects should be considered in the RIA.

2.14. One respondent commented on the implications of the structure of charges project for competition. The respondent was concerned that the difference of treatment between pre- and post-2005 connected generators could distort

[4] "Electricity distribution price control review – initial consultation", July 2003

competition, and disputed the RIA's assertion that changing the connection boundary would aid development of competition in connections.

Costs and benefits

2.15. In developing an RIA it is important that the main costs and benefits are identified, and where possible, quantified, to ensure that the introduction of the policy is appropriate and consistent with Ofgem's statutory objectives. In assessing the costs and benefits arising from the DG incentive framework and the revised charging arrangements, Ofgem has considered the three main parties that will be impacted upon:

- distributed generators;
- consumers; and
- DNOs.

2.16. Although the proposed policies may have an impact on other parties, for example equipment and asset manufacturers (for example, due to increased demand for their products) and other generators, Ofgem considers that the RIA should focus on looking at the costs and benefits for those that are most affected by the new arrangements.

Impact on distributed generators

Structure of charges

2.17. The proposed changes to the structure of charges are expected to benefit DG in two main ways. First, it removes or substantially reduces, the free rider problem arising from deep connection charging whereby subsequent generators connecting to the network do not pay a proportion of the reinforcement costs already paid by the "first-comer" generator. Second, it ensures that generators are only liable for those incremental costs that they give rise to.

DG incentive scheme

2.18. The DG incentive scheme is designed, on average, to provide DNOs with a slightly higher rate of return (assumed to be 7.5 per cent pre-tax real) than would

be allowed if the costs of connection were included in the regulatory asset value (RAV) at the allowed cost of capital (which is presently 6.5 per cent pre-tax real). This may result in slightly higher costs to DG to connect to the network although DNOs would have an incentive to connect them as quickly and efficiently as possible – an incentive that does not exist under the current arrangements.

2.19. The table below sets out the impact, on an average basis, of the incentive scheme providing a return which is 1 percentage point higher than the allowed cost of capital. It is shown for a range of potential new DG capacity, all with an average unit distribution cost at £50/kW (based on the information provided by the DNOs in the DG-Business Plan Questionnaire - BPQ).

Table 2.1: Impact of the DG incentive scheme

New DG capacity MW	Cost if included in RAV at 6.5% cost of capital (£m/year)	Cost under DG incentive scheme at 7.5% return (£m/year)	Total difference (£m/year)	Difference per kW (£/kW/year)
2000	10.6	11.3	0.7	0.35
5000	26.6	28.3	1.7	0.35
10000	53.2	56.6	3.5	0.35

2.20. On average the additional costs to be funded by the generators are small, particularly in relation to the value of the Renewable Obligations Certificate (ROCs) of 3p/kWh, which would yield £92/kW per year for a renewable generator with a 35% load factor. Furthermore, the DG incentive scheme will encourage the DNOs to improve efficiency. Whilst it is difficult to assess the impact of the incentive on cost levels, evidence suggests that DNOs do cut costs significantly when provided with incentives to do so (efficiency incentives under RPI-X price controls have a strong track record of substantial cost reduction in other areas of DNOs' costs). For illustration, if DG related costs are reduced by 6%, the benefit to DG would fully offset the increased charges from the higher return.

2.21. Another impact of the DG incentive scheme and the revised charging arrangements are that they should encourage a higher volume of generation capacity being connected to the distribution networks.

2.22. However, it is difficult to quantify the incremental (or marginal) impact the new arrangements will have. This is partly because the process and decision of whether a new DG connects to the distribution network is affected by many other factors outside of the regulatory issues identified in this RIA. This includes the obtaining of finance and the required planning permission by potential DG and the continuation (and level) of funding provided by the government to renewable generators under the ROCs. These issues are likely to be more important in driving the level of DG than the regulatory policies identified in this RIA. However, it is important that the regulatory framework does not provide barriers to the development of DG (through the structure of charges) and ensures that DNOs have appropriate incentives to respond to the needs of DG by connecting them efficiently and quickly.

Impact on consumers

2.23. Based on the cost-reflective principle in the revised charging framework, the increased costs that arise from DG connecting to the distribution network (increased investment due to connection and reinforcement work) are expected to be borne by those parties that give rise to them, i.e. the generators. Therefore, in general, the costs to consumers are not expected to be affected by the new charging and incentive arrangements.

2.24. One exception to this would be where demand consumers are required to fund a proportion of the revenue a DNO would have recovered from a generator that has subsequently not connected to the network or where it has ceased to operate. The DG incentive scheme is designed to provide some protection to DNOs in relation to the costs that they incur, i.e. by allowing them to 'pass-through' 80 per cent of the costs that they incur. In the event that the generator does not materialise or disappears it is important that the DNO is able to recover the pass-through level of costs. The sources for the recovery of these costs will either be other generators in its authorised area or from demand consumers through respective use of system charges.

2.25. Ofgem has also put in place arrangements which provide a floor (or guaranteed minimum level) of return for DNOs across the whole portfolio of DG projects. This is to ensure that they are able to at least earn a return equal to the cost of debt (as specified by the allowed cost of capital set by Ofgem). If any

adjustments are required to increase the amount of revenue DNOs are allowed to recover this will also need to be sourced from other generators or demand consumers in its authorised area.

2.26. However, in comparison to the average bill paid by demand consumers the expected costs are likely to be very small. For example, if 20% of the DG projects do not materialise after the network has been reinforced to accommodate them, or close before the DNOs' reinforcement assets are fully depreciated, then the average pass-through revenue would be around £8.5m/yr. Under the worst assumption of this being borne wholly by the demand customers, it would equate to around 17p per domestic customer per year.

2.27. DG may provide opportunities to DNOs to run and operate their networks more efficiently and could provide other benefits such as reducing the level of losses or providing improved quality of supply. These benefits are likely to be highly dependent on the location of the DG and other factors such as the nature of the DG itself (e.g. whether it is an intermittent generator such as wind generators) and therefore difficult to quantify in any kind of robust way. Nonetheless the existing regulatory framework provides incentives to DNOs to utilise DG to deliver these benefits where they are available.

2.28. Another factor to be considered is the ROC payment that is made to renewable generators – which are ultimately funded by consumers through their electricity bill. Given that ROC buy-out receipts are recycled, the total sum of the ROC payment will remain constant regardless of the amount of renewable generation that connects to the distribution network. Therefore any incremental increase in DG driven by the regulatory framework is not expected to have an impact on consumers.

2.29. Increased amounts of DG connecting to the distribution network could have an environmental benefit. If the DG incentive mechanism and the new charging structure bring about an increase to the total amount of DG in the next price control period by 1~5%, this would be 100~500MW of additional DG, around 80% of which would be renewables (based on the projections of future DG growth provided by DNOs in their DG-BPQ). The expected amount of electricity produced by this increased level of renewable generation would be between 0.25TWh to 1.23TWh electricity every year. Given the grid-average

emission factor of 0.12tC/MWh, this would result in an environmental benefit in terms of a reduction in carbon emission in the range of 0.029mtC and 0.147mtC. Based on an illustrative value of carbon at £35/tC (which is a conservative estimate against the current recommended range of value from the Interdepartmental Group on the Social Cost of Carbon), the annual environmental benefits can be valued in the range between £1m to £5m.

Impact on DNOs

2.30. The proposed DG incentive scheme provides a number of benefits to DNOs:

- it provides, on average, a higher rate of return than if the costs were included in the RAV at the allowed cost of capital;
- it provides ex-ante protection as to the recovery of the majority of the costs that they will incur and from high cost projects and instances where a generator does not materialise or ceases operation. This is provided by the 80 per cent pass-through and the guaranteed floor; and
- it provides incentives towards efficiency.

2.31. The implementation of the new charging regime is expected to give rise to one-off implementation costs. These have been estimated previously[5] at £10-20 million in total across the industry. These costs mainly relate to new IT and information systems. Efficiently incurred costs would be recovered from consumers and generators given that all network users are expected to benefit from the new charging structure with improved transparency and better price signals resulting from the elimination of the existing distortions and barriers.

2.32. There may well also be a small impact on costs associated with new reporting arrangements for the DG incentive scheme although these are not expected to be significant and if efficiently incurred would be recovered from consumers and generators.

[5] "Structure of electricity distribution charges - initial decision", November 2003

Risks and unintended consequences

2.33. A potential risk for the consumers is that they could bear higher costs relating to DG. If, under a pessimistic scenario, 50% of DG do not materialise after DNOs incur costs or close early before the assets have been fully depreciated, yet the total cost remains the same, then the outturn unit cost is driven from £50/kW to £100/kW. If the cost to generators were capped at £50/kW, then the potential cost to be borne by the demand customers would be £21m per year, which equates on average to 42p per domestic customer per year, against a total bill of £250 (of which about £50 is distribution use of system charge). Whilst this scenario is unlikely to unfold uniformly across the country, it indicates possible downside for consumers which could arise in one or more DNO areas. It is worth noting that such impact would not be solely due to the policies assessed here. Since the introduction in 2002[6] of the option for "annualised" generation connection charges, demand customers have already taken certain risks of underwriting outstanding cost of connection due to DG failure.

Competition

2.34. The proposed arrangements for both charging and the incentive scheme are expected to reduce barriers to entry for DG, which would help facilitate the competition in generation. As these arrangements do not relate to particular types of generation technologies, they are not expected to have a major impact on competition amongst new or existing DG. In moving to arrangements more consistent with those in transmission and allowing for flexibility for further alignment where and when appropriate, the proposed arrangements also help to facilitate competition between distribution and transmission-connected generators.

Review and compliance

2.35. Ofgem will set up appropriate monitoring regime to collect information on the operation of both the DG incentive scheme and the charging arrangements –

[6] "Distributed generation: price controls, incentives and connection charging – further discussion, recommendations and future action", March 2002

both to ensure that DNOs are complying with their licence conditions and to review the effectiveness of the policies over the course of the next price control period.

Conclusion

2.36. The conclusions that can be drawn from this RIA are that the potential benefits of the proposed arrangements that would be realised, primarily by DG, but also those by all other parties, outweigh the costs (or negative impacts).

2.37. The arrangements will also help to reduce barriers to entry for DG, and thus are expected to facilitate the achievement of the Government's environmental targets at lower network cost than would otherwise arise, through improving the efficiency of connection to and use of the distribution networks.