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Distributed generation:

A review of progress

Summary

In September 2001 and March 2002 Ofgem consulted on interim measures that might be put in place - in advance of the next distribution price control review - to remove perceived barriers to the development of generation connected to distribution networks.

Although Ofgem has a leading role to play in developing an appropriate regulatory framework for distributed generation, the DTI, DEFRA, the Scottish Executive and Distributed Generation Co-ordinating Group (DGCG) also share important responsibilities in this field. This document summarises that division of responsibility.

A main objective of Ofgem's paper of March 2002 was to propose action that might be taken, before the next distribution price control period starts in April 2005, to remove unjustifiable barriers to the development of distributed generation. The main proposals were:

- the option of 'annualised charging' under existing connection charge methodology;
- consultation on reimbursing non-domestic 'initial contributors' from proceeds of later connections;
- establishing agreed classification (banding) of distributed generation;
- separate and appropriate identification of import and export active power quantities as best commercial practice for distributed generation; and
- full and comprehensible information for all prospective distributed generators.

The majority of responses to Ofgem's interim proposals were positive. There was support for the rationale underlying the proposals. In particular there was broad agreement with the conclusion that early re-opening of the distribution price control would be unhelpful.

Responses were generally in favour of a move to shallower connection charging from April 2005, although not in favour of completely shallow charging. Some responses said that a degree of cost-reflection and locational signalling should be preserved. An

outcome likely to attract support would achieve broad consistency with the principles currently applied by NGC for grid connections.

It was recognised that simplicity and comprehensibility were important considerations for domestic-level generation. Profiling of these customers will require further work. It is not yet possible to say what level of use of system charges will be appropriate, relative to those currently paid by domestic demand customers.

Nine DNOs indicated that they would be prepared to offer the alternative of annualised charges, although most of these suggested that there were important points of detail, mainly related to possible generator failure, to be resolved before the new policy could be implemented. Responses from suppliers and generators were also content with annualised charging as an interim solution, although they stressed the need for a robust, enduring solution to emerge from the distribution price control review that would fully address the true costs and benefits of distributed generation.

Ofgem recognises DNOs' concerns about the increased risk arising from annualised charging and, in the longer term, from significantly increased levels of distributed generation. These concerns are linked to the question of incentives on DNOs to connect distributed generation. These are areas that Ofgem is addressing in a separate consultation.

Annualised charging could make the recovery of 'deep' reinforcement costs vulnerable to generator failure. Ofgem, however, considers that it is the responsibility of a DNO to assess the risks involved in providing a connection to their network to a generator and take appropriate measures to protect itself from any potential credit risk. Ofgem would expect these measures to be in line with commercial practice in a comparable competitive market, in a way that was non-discriminatory and facilitated competition. Ofgem intends to publish a document in the near future which will set out its thoughts on credit cover. It is intended that the broad principles outlined in that document should be applied in consideration of connection charges for distributed generation. Following publication of the credit cover document Ofgem intends to discuss with the DNOs the practical implications of the introduction of the principles for credit cover including the issues relating to connection charges for distributed generation.

Modifications to ER P2/5 will be helpful in enabling DNOs to contract with distributed generators as an alternative to investment in network assets. Ofgem will need to take

account of the impact on DNOs' costs. The reduction in capital expenditure resulting from avoided investment would be accompanied by an increase in operating expenditure to the value of payments under the contracts. Ofgem will be considering how best to ensure that DNOs will not be deterred from making appropriate use of distributed generation.

Ofgem's paper of March 2002 proposed a joint consultation with DTI on amendment to the Electricity (Connection Charges) Regulations 2002. Generators requesting a connection to an electricity distribution system have to pay for the new network assets associated with their connection. A feature of the existing mechanism for charging for connection is that such 'initial contributors' may subsequently find that those seeking later connections, to the same part of the network, make partial use of those new assets - without having to pay anything in respect of them. Connection charges for subsequent connections can thus be significantly lower than those paid by the 'initial contributor'. The 'second comer' can therefore 'free-ride' on the initial investment. The proposed amendment would remove the possibility of 'free riding', by providing for partial reimbursement of initial contributors from the proceeds of subsequent connections. On 14 June 2002, Ofgem issued a separate consultation paper on the proposed amendment to these Regulations. The responses were favourable and Ofgem and DTI are currently considering how best to take account of the suggestions contained in them. It is anticipated that amended Regulations could come into force in mid 2003.

Ofgem's September 2001 consultation sought views on the bands or classes into which distributed generation might sensibly be divided. Responses suggested there to be merit in taking this work forward, and in understanding how banding might relate to the development of distributed generation. In co-operation with the DGCG's Technical Steering Group, the Distribution Code Review Panel issued a consultation paper on banding on 28 May 2002. A pilot document, based on the responses to that consultation has been placed on the DGCG website (www.distributed-generation.org.uk). It is intended periodically to review the suggested banding structure set out in that document, and certainly to do so in early 2003.

Having considered responses to this consultation, Ofgem remains of the view that net metering, with its consequent cross subsidy, would not be an appropriate option in a liberalised market. Imports and exports of active power should be separately metered for

all distributed generators. Over time, more sophisticated metering installations may be installed, even for domestic generation.

Good progress has been made with the preparation of the Long-Term Development Statements required under standard licence condition 25 of the Distribution Licence. The statements indicate – over a five-year period – the likely use and development of the DNO's network, including information about the existing distribution network, the predicted capacity constraints, opportunities for new connections and planned works. DNOs' interim statements were of high quality. In late August 2002 Ofgem issued the formal direction under the licence condition, requiring DNOs to publish a long-term development statement within three months. The statements will be of material assistance to prospective distributed generators.

There was general agreement that, while many of the issues raised by distributed generation should be addressed as part of the next distribution price control review, important specific workstreams could be progressed immediately. These included monitoring and understanding the implications of early changes to distribution networks, reviewing Engineering Recommendation P2/5¹, developing simplified and standard connection arrangements for domestic combined heat and power (DCHP) installations, and exploring the possibilities for the 'Registered Power Zones' envisaged in Part VI of this paper.

On 10 September 2002 Ofgem held a joint workshop with the Institution of Electrical Engineers on the subject of 'Distribution Networks and Renewable Generation and CHP'. In a keynote speech, Ofgem Chief Executive, Callum McCarthy emphasised that the levels of distributed generation required to meet the Government's targets for renewable and CHP generation would:

- require fundamental rethinking of the activities of transmission and distribution and of how they interact;
- alter a number of the existing obligations of DNOs, as distribution networks become an element of the national energy balance;

¹ In order to meet consumer demand, DNOs are obliged to develop their networks in accordance with the security requirements of ER P2/5. However, this document was drafted to take account of electricity generation as it was in the 1970s: it does not reflect the sort of distributed generation technologies currently envisaged for connection to distribution networks. Copies of ER P2/5 may be ordered from : www.electricity.org.uk/srch_fr.html

- present the new option of encouraging investment in distributed generation rather than choosing to invest in network assets for the provision of capacity; and
- require a regulatory framework characterised by effectiveness, predictability, simplicity, fairness and consistency.

On 10 January 2003 Callum McCarthy sent an open letter to the Chief Executives of the DNO businesses, setting out further thinking on the future regulatory framework for distribution networks. The full text of the letter can be found on the Ofgem website www.ofgem.gov.uk

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1. Background

Issue

- 1.1 Since Ofgem published its initial response to the report of the Embedded Generation Working Group (EGWG)² on 6 April 2001, considerable progress has been made in addressing the issues likely to arise from the connection of increased amounts of distributed generation. The Distributed Generation Co-ordinating Group (DGCG)³, and the Technical Steering Group (TSG) that reports to it, are actively taking forward a wide range of relevant projects. Following a preliminary consultation⁴, Ofgem has issued interim proposals on price controls, incentives and connection charging (March 2002)⁵. The proposed arrangements would remain in place until the start of the next distribution price control period in April 2005.
- 1.2 Ofgem's consultation paper of March 2002 (page 3) set out the detailed rationale for consultation and interim proposals on price controls, incentives and connection charging. One of the main recommendations of the EGWG report was that Ofgem should review the structure of regulatory incentives on Distribution Network Operators (DNOs) in the light of the statutory duty on DNOs to facilitate competition. The paper of March 2002 also noted that the Government's draft statutory social and environmental guidance (made under section 14 of the Utilities Act 2000) asked Ofgem to have regard to the desirability of:
- removing barriers to distributed generation;
 - access to the distribution network on fair and transparent terms for distributed generation;
 - distribution systems capable of accommodating the likely growth in distributed generation (having regard to the Government's targets for

² The EGWG Report is available on www.dti.gov.uk/energy/egwg/index.htm

³ The DGCG has a website on www.distributed-generation.org.uk

⁴ 'Embedded generation: price controls, incentives and connection charging', Ofgem, September 2001 www.ofgem.gov.uk/public/pub2001q3.htm

⁵ 'Distributed generation: price controls, incentives and connection charging', Ofgem, March 2002 www.ofgem.gov.uk/public/pub2002q1.htm

renewable generation and CHP);

- arranging charging regimes for the connection of distributed generation on fair and transparent terms; and
- easy availability of information relevant to prospective generators' decisions on connection to distribution networks.

1.3 In summary, Ofgem's paper of March 2002 made the following interim recommendations, for implementation in advance of the next distribution price control review:

- the option of 'annualised charging' under existing connection charge methodology;
- consultation on reimbursing non-domestic 'initial contributors' from proceeds of later connections;
- establishing agreed classification (banding) of distributed generation;
- separate and appropriate identification of import and export active power quantities as the general commercial best practice for distributed generation; and
- full and comprehensible information for all prospective distributed generators.

1.4 On 10 September 2002 Ofgem held a joint workshop with the Institution of Electrical Engineers on the subject of 'Distribution Networks and Renewable Generation and CHP'. In a keynote speech, Ofgem Chief Executive, Callum McCarthy emphasised that the levels of distributed generation required to meet the Government's targets for renewable and CHP generation would:

- require fundamental rethinking of the activities of transmission and distribution and of how they interact;
- alter a number of the existing obligations of DNOs, as distribution networks become an element of the national energy balance;

- present the new option of encouraging investment in distributed generation rather than choosing to invest in network assets for the provision of capacity; and
 - require a regulatory framework characterised by effectiveness, predictability, simplicity, fairness and consistency.
- 1.5 On 10 January 2003 Callum McCarthy sent an open letter to the Chief Executives of the DNO businesses, setting out further thinking on the future regulatory framework for distribution networks. The full text of the letter can be found on the Ofgem website www.ofgem.gov.uk

Objectives

- 1.6 The overall aim of this document is to review progress to date on distributed generation issues. To achieve this it:
- identifies the projects and workstreams currently being undertaken by Ofgem and the DGCG respectively, setting out their relevance to distributed generation; and
 - summarises responses to Ofgem's interim proposals and to the other content of the paper of March 2002.
- 1.7 Distributed generation is a complex area of work in respect of which responsibilities are shared across a number of organisations. Some responses to the paper of March 2002 highlighted the need for a clear and concise explanation of which organisations are progressing work areas - and particularly what the relationship is between Ofgem's work and that of the DGCG. Although the DGCG website is now available (www.distributed-generation.org.uk) to keep interested parties abreast of developments, a review of the current position would seem to be a helpful part of this document.
- 1.8 Responses to the interim proposals in the paper of March 2002 were generally favourable. This paper summarises the main points raised in respect of the proposals, and seeks to add clarification where responses indicated that it would be helpful to do so. It will, in particular, be of use to potential distributed

generators to have an overview of what might now realistically be expected from Distribution Network Operators (DNOs).

2. Timetable and responses

Overall timetable

2.1 This document represents the end of the first stage in Ofgem's work on price controls, incentives and connection charging in relation to distributed generation. It began with the EGWG report of January 2001 and culminates with this paper. As the consultation document of March 2002 made clear, the interim measures that Ofgem has proposed will remain in place until the next distribution price control takes effect – in April 2005. Much work remains to be done but it will be appropriate to take it forward in the context of Ofgem's:

- consultation on the framework of price controls for monopoly networks, in respect of which a consultation document was issued on 7 August 2002 and final proposals are anticipated in March 2003;
- consultation on distribution charging structures, on which Ofgem issued a consultation document on 24 October 2002⁶ and on which it plans to issue a statement document in March 2003;
- open letter of 10 January 2003 to DNO Chief Executives, which set out further thoughts on how the regulatory framework could be developed to ensure that DNOs have appropriate incentives to develop and operate their networks on an efficient and co-ordinated basis; and
- distribution price control review, which will take place during 2003 and 2004.

Structure of the document

2.2 Part III of this document outlines current responsibilities and initiatives in the field of distributed generation. It serves also to set the scene for references, later in the paper, to actions that are either in progress or that may need to be taken in the near future. Part IV summarises responses to Ofgem's interim recommendations, commenting where appropriate. Part V sets out views about tasks that will form part of the next distribution price control review. Part VI

⁶ 'Structure of distribution charges – update document', Ofgem, 69/02, 24 Oct 02

deals with other pieces of work that are being taken forward separately from the price control review. A revised overall timetable is set out in Appendix 1. Appendix 2 lists the organisations and individuals that responded to Ofgem's paper of March 2002.

Responding to this document

- 2.3 Although this is not primarily a consultation document, Ofgem would be interested to hear from those with an interest in the issues that it covers.
- 2.4 All responses will normally be published on the Ofgem website and held electronically in the Research and Information Centre – unless there are good reasons why they must remain confidential. Consultees should try to put any confidential material into appendices to their responses. Organisations whose e-mail software automatically attaches text about confidentiality would assist Ofgem by explaining the extent of its application to any response to this document.
- 2.5 It would be helpful to receive any responses by Friday, 7 March 2003. They should be sent to:

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9 Millbank
London SW1P 3GE

Tel: 020-7901-7297
Fax: 020-7901-7197
E-mail: arthur.cooke@ofgem.gov.uk

- 2.6 If you have any queries regarding the issues raised in this document, Arthur Cooke or Steve McBurney on 020-7901-7371 (E-mail: steve.mcburney@ofgem.gov.uk) would be pleased to assist you.

3. Responsibilities and work programmes

Introduction

- 3.1 Distributed generation, and the issues in respect of the impact of increased quantities of it on DNOs' networks, involves a range of organisations contributing to a variety of complex initiatives and programmes. These workstreams are often interrelated such that proposals in one area may constrain the outcomes in another. New working groups have been set up to address specific areas of work. To those not routinely involved, the respective responsibilities and interactions may seem confusing. Indeed, a number of individuals have told Ofgem that they find it difficult to understand the roles and responsibilities of each group. Lack of concise and accessible information about responsibilities hampers effective communication of the issues and outcomes. Organisations likely to be interested in small and micro-generation schemes, for example, may often lack the research and networking resources accurately to identify responsibilities.
- 3.2 This part of the document sets out, as concisely as possible, what the various organisations and workstreams presently are. Where possible links to relevant websites and documents have been provided.

Department of Trade and Industry (DTI)

- 3.3 DTI has a broad policy responsibility⁷ for the provision of safe, secure, diverse and sustainable supplies of energy at competitive prices. In accordance with that responsibility, the DTI has developed arrangements for delivering the Government's targets for renewable energy and is concerned to ensure that all technical, commercial and regulatory network-related barriers to achieving those targets are addressed. To this end, the DTI has established a Distributed Generation Programme within its Sustainable Energy Support Programme that specifically aims to address these barriers and to facilitate the development of generation connected to distribution networks. Through the Distributed Generation Programme, the Department continues to sponsor a range of projects related to the connection of generation to distribution networks and utilises the

⁷ with Ofgem

programme to fund work identified by the Distributed Generation Co-ordinating Group. Further information is available on the DTI website:

www.dti.gov.uk/energy

Department for Environment, Food and Rural Affairs (DEFRA)

3.4 One of its aims being the achievement of an integrated approach to sustainable development, DEFRA has broad policy responsibility for protection and improvement of the environment. In the energy field, the environmental benefits of renewable and distributed generation are of interest to DEFRA.

3.5 Within Government DEFRA leads on Combined Heat and Power (CHP) policy. One of the Government's targets is to achieve at least 10 GW of Good Quality CHP capacity by 2010. The Government has developed a draft strategy for reaching this target, and for developing a strong CHP base for the longer term (see: <http://www.defra.gov.uk/environment/consult/chpstrat/index.htm>).

Measures to support CHP discussed in the draft strategy include:

- Climate Change Levy exemption on fuel inputs to Good Quality CHP and on Good Quality CHP electricity outputs sold direct to end users;
- Climate Change Agreements to provide an incentive for emissions reductions;
- the UK emissions trading scheme;
- eligibility for Enhanced Capital Allowances (ECAs), to stimulate investment;
- Business Rates exception for CHP power generation plant and machinery;
- changes to the licensing regime, benefiting smaller generators;
- a reduction in VAT on certain grant-funded domestic micro-CHP installations;
- the launch of the £50m Community Energy programme to encourage CHP in community heating schemes; and

- promotion and support by the Carbon Trust, in non-domestic markets, and the Energy Savings Trust, in domestic markets, for the development of energy efficiency and low carbon technologies, including CHP.
- 3.6 DEFRA operates the CHP Quality Assurance Programme (CHPQA). CHPQA is a Government initiative to encourage the wider practical application of CHP, community heating and alternative fuel technologies. Its aims are to:
- define, assess and monitor the quality of CHP schemes on the basis of energy efficiency and environmental performance;
 - ensure that fiscal and other benefits are in line with environmental performance;
 - provide clear signals to users and potential users to minimise the cost of energy demands through CHP; and to
 - achieve these aims at minimum cost to CHP users and to the Government.
- 3.7 CHPQA provides a methodology for assessing the quality of CHP schemes and their qualification as CHP for all or part of their inputs, outputs and capacity. CHPQA offers Registration and Certification in accordance with the criteria for Good Quality CHP and hence qualification for benefits. Certification issued under the scheme may be used for determining eligibility for fiscal or other benefits and for determining compliance with regulatory requirements where quality is relevant to entitlement. Application for CHPQA is voluntary. Further information is available on the DEFRA website: www.defra.gov.uk

The Scottish Executive

- 3.8 The Scottish Executive is the devolved government for Scotland. It has responsibility for the environment generally and, in particular, has executive and legislative responsibility for the implementation in Scotland of the UK Government's responsibilities in respect of renewable energy. It also has legislative responsibility for planning issues, including guidance to local

planning bodies in respect of, inter alia, facilitating renewable generation.

Further information is available on the website: www.scotland.gov.uk .

Ofgem

3.9 As the economic regulator of gas and electricity markets, Ofgem has a central role in removing regulatory barriers to distributed generation and in ensuring fair and transparent arrangements for its connection. Further information about Ofgem, together with copies of its published papers, is available on www.ofgem.gov.uk .

3.10 Ofgem has set up a Distributed Generation Project to ensure that, across all its regulatory activities, it addresses:

- removal of barriers to distributed generation;
- fair and transparent network access, together with recognition of the contribution that distributed generation can make to network management;
- the ability of distribution systems to accommodate renewable generation and CHP;
- fair and transparent connection charging regimes; and
- ready availability of relevant information about connecting generation to distribution networks.

3.11 The Structure of Distribution Charges Review (2000 – 2003), which is likely to culminate in final proposals in June 2003, considers whether the present structure of distribution use of system (DUoS) charges:

- is cost-reflective;
- is consistent with licence obligations;
- provides appropriate economic signals to ensure the efficient use and development of the distribution networks;
- is sufficiently transparent to facilitate the development of competition in supply, metering and connections; and

- is consistent with any statutory guidance issued by Government on social and environmental matters.
- 3.12 Ofgem published an update document on this subject on 24 October 2002. It is available on www.ofgem.gov.uk .
- 3.13 The Project on Developing Price Controls (2002 – early 2003) looks at how the framework for price controls might be improved, in terms of consistency and transparency. It will lay the foundations for the next distribution price control review, giving a clear understanding of objectives, issues, and methodology. An important element of this work will be reviewing the incentive framework in price controls. Ofgem published a consultation document on 7 August 2002. It is available on www.ofgem.gov.uk
- 3.14 The Distribution Losses Project will include, as a major element in its work, consideration of the role of distributed generation in the reduction of electrical losses on distribution systems. Consultation will take place early in 2003. A decision document is planned for June 2003.
- 3.15 The Distribution Price Control Review (2003 – 2004) will include consideration of those issues related to distributed generation identified in Ofgem's paper of March 2002. Some of the issues are so closely related to the principles underlying the distribution price control that they could only receive consideration as part of the price control review.

The Embedded Generation Working Group (EGWG)

- 3.16 There has been some apparent confusion of the EGWG with the Distributed Generation Co-ordinating Group (DGCG – see below). During the year 2000, a joint government-industry working group (EGWG) considered network access issues arising from the proposed increase in connection of distributed generation. The DTI published EGWG's final report on 7 June 2001. It is available on: www.dti.gov.uk/energy/egwg/index.htm The report's main conclusions were that:

- Ofgem should review the structure of regulatory incentives on distribution network operators (DNOs) in the light of the new statutory duty on DNOs to facilitate competition⁸; and that
- a group should be established under Government leadership to co-ordinate and take forward the implementation of EGWG's recommendations for the longer term.

3.17 The DGCG was set up in response the second of these main recommendations. EGWG, therefore, ceased to exist in early 2001. The DGCG continues to monitor the consideration of its recommendations.

3.18 A group similar to EGWG (Scottish Embedded Generation Working Group – SEGWG) was set up, under the aegis of the Scottish Executive, to consider similar issues insofar as industry structures and operating conditions are different in Scotland. SEGWG reported on 30 March 2001.

The Distributed Generation Co-ordinating Group (DGCG)

3.19 In response to one of EGWG's main recommendations, DTI and Ofgem have established the DGCG. The group meets quarterly, and will produce an annual report. Its terms of reference are:

- To recommend priorities for action arising from the recommendations of the joint government industry working group on embedded generation.
- To monitor and comment on action taken in respect of the recommendations of the report and to advise on progress.
- To provide advice to DTI, DEFRA, the Scottish Executive and Ofgem on any additional action that may be required as a result of the progress made or events encountered which hinder such progress.
- To establish a Technical Steering Group, to review reports from it and to direct its work programme.

⁸ Section 9 of the Electricity Act 1989, as modified by section 50 of the Utilities Act 2000.

- To consider and make recommendations as to any complementary (e.g. research and development) action what may be helpful to achieving the objectives set out in the EGWG report.
- To disseminate the results of its activities to the wider community.

3.20 Full details of the DGCG, including a membership list, notes of meetings and consultations papers, is on the DGCG website at: www.distributed-generation.org.uk

The Technical Steering Group (TSG)

3.21 The DGCG subsequently created the TSG, which draws on a wide range of expertise from the electricity industry and associated organisations. Its terms of reference are to steer and report on work programmes necessary across the industry to support the objectives set by the DGCG. It is addressing a considerable number of technical and technical/commercial issues likely to arise from increased connection of distributed generation.

3.22 The TSG co-ordinates the work of six workstreams, each of which will manage a number of projects. The workstreams and their overall tasks are set out in the following table.

No.	Workstream	Area of work
1	Distributed Generation Status and projections	<ul style="list-style-type: none"> • Current status of connected and planned distributed generation. • Likely future distributed generation mix.
2	Standardisation of Information and Solutions	<ul style="list-style-type: none"> • Relevant and accessible standards for the industry, reflecting current developments. • Appropriate categorising, or banding, of distributed generation types. • EGWG recommendations on information and guidance documents.
3	Short-term Network Solutions	<ul style="list-style-type: none"> • Technical, regulatory and commercial issues relevant to the development of basic active management of distribution networks. • Identification of short-term measures to allow fuller recognition of the contribution of distributed generation to network security and performance.

4	Micro-generation Solutions	<ul style="list-style-type: none"> • Removal of barriers to micro-generation. • Simple, standard solutions for connection of micro-generation. • To advise on micro-generation in the context of the next distribution price control review.
5	Long-term Network Concepts and Options	<ul style="list-style-type: none"> • Technical, regulatory and commercial issues pertaining to the longer-term transformation of distribution networks in order to facilitate distributed generation.
6	Industry Skills and Resources	<ul style="list-style-type: none"> • To help ensure that future skills and human resource requirements of DNOs and other organisations do not present barriers to the implementation of EGWG recommendations.

3.23 Further details of these workstreams are accessible on the DGCG website (www.distributed-generation.org.uk), which is kept regularly updated.

Project management and co-ordination

3.24 Recognising the requirement for co-ordination of Ofgem and DGCG/TSG work, and for tracking progress with the EGWG recommendations, Ofgem and DTI have appointed a Programme Manager⁹ whose role is to:

- to develop an agreed overall work-plan covering all the recommendations of the EGWG report, together with any additional issues that the DGCG decides should also be addressed;
- to ensure, as far as is possible, that the work programme keeps to schedule and is successfully addressing the recommendations of the EGWG (and where problems arise these are identified quickly, solutions brokered and modifications to the plan are agreed and implemented);
- to ensure proper co-ordination and communication between the various parties fulfilling elements of the agreed work programme;
- to ensure that the DGCG and other players are kept fully informed of progress and issues arising; and to
- to ensure that the DGCG and other players are alerted to, and kept apprised,

⁹ A Principal Consultant at Future Energy Solutions, Harwell.

of relevant developments, technical or otherwise, beyond the immediate activities of the Group.

4. Responses to Ofgem's interim proposals

Introduction

- 4.1 This section of the paper summarises responses to Ofgem's paper of March 2002¹⁰. There were 21 responses, from the organisations and individuals listed at Annex A to this paper.

Summary of proposals

- 4.2 A main objective of Ofgem's paper of March 2002 was to propose action that might be taken, before the next distribution price control period starts in April 2005, to remove unjustifiable barriers to the development of distributed generation. In summary, the main interim proposals were:

- giving distributed generators the choice of paying only a shallow connection charge up-front, with further costs being spread through an annualised connection charge - as opposed to paying a deep connection charge initially;
- improving the process for network studies, so as to reduce the time and cost of handling individual generation proposals;
- reimbursing 'initial contributors' when other connections subsequently share connection assets for which they have paid;
- reducing connection charges where the new connection helps the DNO to avoid asset replacement or reinforcement costs;
- new standards for quotations for connection of distributed generators;
- ensuring that householders who purchase DCHP equipment will not be faced with burdensome procedures or unreasonable charges;
- appropriately metering imports and exports of active power, to ensure fair, cost-reflective charging;
- protecting the interests of existing distributed generators; and

¹⁰ Distributed generation: price controls, incentives and connection charging: Further discussion, recommendations and future action', Ofgem March 2002 www.ofgem.gov.uk/public/pub2002q1.htm

- ensuring that accurate, comprehensible information is available to anyone interested in connecting distributed generation.

General reactions

- 4.3 The majority of responses to Ofgem's interim proposals were positive. One respondent described the proposals as striking a pragmatic balance between what is achievable in the near future and what would require more careful consideration. There was support for the rationale underlying the proposals. In particular there was broad agreement with the conclusion that early re-opening of the distribution price control would be unhelpful.
- 4.4 An organisation representing renewable generators commented that several of Ofgem's recommendations should benefit distributed generation. Although transitional in nature, and not capable of creating an enduring charging environment, they constituted a useful development - particularly when linked to the work of the DGCG and to the next distribution price control review.
- 4.5 A DNO response commented that the proposals would ameliorate the position of prospective distributed generators, whilst causing minimum disruption to the existing arrangements.
- 4.6 In contrast, one major generator took the view that the proposals would have little impact. This response pointed out that there had never been anything to restrain DNOs from offering annualised charges. While we recognise that there has been no constraint to prevent annualised charges, Ofgem is not aware that the DNOs (or the Public Electricity Suppliers before them) have ever offered an annualised charging option for distributed generation connections. In light of this, the proposals represent a step forwards.
- 4.7 Two responses referred to the changing policy environment and to the anticipated Government White Paper on energy. They emphasised that Ofgem's work programme and policy should be sufficiently flexible to accommodate changes in energy policy. Ofgem agrees with this point. The document of March 2002 emphasised that its interim proposals should not prejudice future decisions.

- 4.8 A number of responses mentioned longer-term issues, drawing attention to the need for Ofgem and the DGCG to work to clear timetables, although there seemed to be no disagreement with issues for future work as set out in Part VIII of the document of March 2002. An organisation representing generators emphasised that progress in developing methods for operating and managing networks would not be easy to achieve. This response stressed that considerable guidance and encouragement would be required of Ofgem. The timing of Ofgem's work will now largely be linked to the timetable for price control work. Updated timetable information is maintained on the DGCG's website www.distributed-generation.org.uk. Two TSG workstreams are directly concerned with the development of distribution networks.
- 4.9 Two responses specifically mentioned the need for consistency, which would assist potential distributed generators in delivering the levels of generation now under discussion. Ofgem recognises the force of both lines of argument. The first response stressed that compatibility and consistency of the principles underlying transmission and distribution access would be important in ensuring the permanent removal of barriers. The other pointed to the need for increased consistency amongst DNOs in their interpretation of principles applicable to:
- connection charging;
 - application of rules for second comers;
 - identification of network benefits associated with generation; and
 - apportionment of deep reinforcement costs, according to network requirements.
- 4.10 Two responses suggested that there was a lack of transparency about the next distribution price control review and about the work of the DGCG. Nevertheless, both Ofgem and the DGCG have been engaged in preparatory work that has not been apparent to the wider community. Subsequently, publication of a consultation document on the price control of networks, together with the creation of the DGCG's website, should help to address these concerns. Ofgem hopes that this document will also be of assistance in putting recent developments into their proper context.

Connection charging

- 4.11 Responses were generally in favour of a move to shallower connection charging from April 2005, although not in favour of completely shallow charging. Some responses said that a degree of cost-reflection and locational signalling should be preserved. An outcome likely to attract support would achieve broad consistency with the principles applied by NGC for grid connections.
- 4.12 It was recognised that simplicity and comprehensibility were important considerations for domestic-level generation. Profiling of these customers will require further work. It is not yet possible to say what level of use of system charges will be appropriate, relative to those currently paid by domestic demand customers.
- 4.13 Content with Ofgem's interim proposals, opinion amongst renewable generators is that the distribution price control review should deliver an enduring solution to which schemes set up between mid 2002 and April 2005 would be free to migrate.
- 4.14 One response mentioned that a move to shallower charging would tend to dilute the incentive on generators to opt for single-circuit connections. There were circumstances in which this would have implications for network security. The response stressed the requirement for consistency between technical and commercial signals.
- 4.15 There is a debate to be had about the apportionment of reinforcement costs. One DNO response summarised the issue with a recognition that small customers should not pay deep reinforcement costs that would be out of proportion to their network requirements, while questioning whether 25% of available capacity (the '25% Rule') was an appropriate criterion for distributed generators. The response suggested that fault level contribution and voltage rise might be more appropriate than ratio of capacities. Ofgem would be interested to consider any suggestions for guidance or rules of thumb that DNOs or generators may be able to propose.

Annualised charges

- 4.16 Several DNOs indicated that they would be prepared to offer the alternative of annualised charges, although most of these suggested that there were important points of detail, mainly related to possible generator failure, to be resolved before the new policy could be implemented. Four responses were unclear as to whether the DNO would be prepared to offer this alternative, either because they saw choice of payment terms as appropriate only for larger distributed generators or because they had serious reservations about the additional risk that the annualised charging option would bring. Only one response gave the impression that prospective distributed generators would be unlikely to secure a choice of payment terms.
- 4.17 It seems to be accepted that there are currently insufficient distributed generators to constitute a class capable of supporting generator distribution use of system (GDUoS) charges. Site-specific charging therefore appears to be the sensible option for the present. This aspect will, of course, be reviewed as part of the review of charge structures.
- 4.18 At least one DNO claimed already to be offering an annualised payment option, albeit to a limited extent. That company was clear that it would be prepared to extend the practice, subject to suitable risk management and to the creditworthiness of applicants.
- 4.19 Most DNO responses highlighted issues of risk as an important topic – both for the interim solution of annualised charging and possible generator failure, and for the price control review. Where there was uncertainty about the readiness of a DNO to consider this sort of arrangement, increased risk was invariably at the heart of the matter. Particular mention was made of:
- the need for DNOs to earn a rate of return commensurate with the risks attendant upon annualised charging;
 - inclusion of residual net capital costs in the DNO's Regulatory Asset Base (RAB), to enable recovery of stranded costs in future price control periods;

- the need to decide on a suitable period over which connection costs might be deferred (one DNO suggested five to ten years); and
- the fact that deferred connection charging would increase DNOs' recorded capital spending, and that this should not count against them in any regulatory assessment of capital efficiency.

4.20 Responses from suppliers and generators were also content with annualised charging as an interim solution, although they stressed the need for a robust, enduring solution to emerge from the distribution price control review that would fully address the true costs and benefits of distributed generation. Specific issues to which they sought to draw Ofgem's attention were:

- the goal of GB-wide consistency;
- avoidance of cross-subsidy;
- availability of choice of firm or non-firm connection; and
- the need for rules on fault level that recognised the contribution of transmission-connected generation and that would not put an individual generator in the position of paying for expensive replacement of switchgear, the rating of which would be marginally exceeded by the new connection.

4.21 There appears to be recognition that a robust, formal 'With/Without Test' to assess the costs and benefits of distributed generation to distribution networks is not currently feasible. There are indications in responses that there would be support for further work in that area. Meantime, the most workable approach would be one of commercial negotiation on generators' proposals.

4.22 Ofgem had suggested that, in the absence of a 'With/Without Test', DNOs might be able reliably to identify at least some circumstances in which the connection of a generator might defer investment in asset replacement. In such circumstances, Ofgem considers that it would be appropriate for the DNO to adjust the connection charges in such a way as to reflect the consequent saving. Two DNOs strongly supported Ofgem's suggestion, stating that it was already their practice. A generator's response considered there to be great merit in the idea, but questioned whether there was any effective incentive on DNOs to

makes such adjustments. One DNO response outlined misgivings about adjusting connection charges to reflect deferment of asset replacement. This suggested that there were implications for future price controls, in that actual RAB figures would take the place of planned figures. Thought would have to be given to how the benefit could be shared with generation. No other response anticipated such a difficulty. However, Ofgem sees merit in the suggestion in this response that the next distribution price control review should identify a suitable and enduring incentive scheme that would reward efficiently deferred or avoided capital expenditure.

4.23 Several DNO responses welcomed Ofgem's suggestion that consideration would be given to financing deep reinforcement in anticipation of clusters of distributed generation. DNOs expressed interest in discussing specific, properly justified reinforcement schemes. One of these responses highlighted the need to consider the relative position of demand customers (e.g. urban regeneration schemes) and the avoidance of discrimination. Ofgem will consider this aspect, although it is noted that other DNO responses have emphasised the differences between the costs imposed by generation connections (e.g. voltage control and fault levels) when compared with demand connections.

4.24 Ofgem recognises the concerns that DNOs have expressed about the increased risk arising from annualised charging and, in the longer term, from significantly increased levels of distributed generation. This is linked to the question of incentives on DNOs to connect distributed generation. These are areas that Ofgem is addressing in a separate consultation.

4.25 We recognise the concerns that DNOs have expressed about the increased risk arising from annualised charging and that insofar as the interim position – before April 2005 – is concerned a move to annualised charging could make the recovery of 'deep' reinforcement costs vulnerable to the commercial failure of a generator. Ofgem considers that it is the responsibility of a DNO to assess the risks involved in providing a connection to their network to a generator and take appropriate measures to protect itself from any potential credit risk. Ofgem would expect these measures to be in line with commercial practice in a comparable competitive market, in a way that was non-discriminatory and facilitated competition. Ofgem intends to publish a document in the near future

which will set out its thoughts on credit cover. It is intended that the broad principles outlined in that document should be applied in consideration of connection charges for distributed generation. Following publication of the credit cover document Ofgem intends to discuss with the DNOs the practical implications of the introduction of the principles for credit cover, including the issues relating to connection charges for distributed generation.

- 4.26 As modifications to ER P2/5 enable DNOs to contract with distributed generators as an alternative to investment in network assets, Ofgem will need to take account of the impact on DNOs' costs. The reduction in capital expenditure resulting from this avoided investment would be accompanied by an increase in operating expenditure to the value of payments under the contracts. Ofgem will be considering how best to ensure that DNOs will not be disincentivised from making appropriate use of distributed generation.

The Electricity (Connection Charges) Regulations 2002

- 4.27 Ofgem's paper of March 2002 proposed a joint consultation with DTI on amendment to the Electricity (Connection Charges) Regulations 2002. Generators who request a connection to an electricity distribution system have to pay for the new network assets associated with their connection. A feature of the existing mechanism for charging for connection is that such 'initial contributors' may subsequently find that those seeking later connections, to the same part of the network, make partial use of those new assets - without having to pay anything in respect of them. Connection charges for subsequent connections can thus be significantly lower than those paid by the 'initial contributor'. The 'second comer' can therefore 'free-ride' on the initial investment. The proposed amendment would remove the possibility of 'free riding', by providing for partial reimbursement of initial contributors from the proceeds of subsequent connections.
- 4.28 On 14 June 2002, Ofgem issued a consultation document on the proposed amendment to these Regulations¹¹. Responses to that document will be considered separately. The purpose of this section is to indicate what the initial

¹¹ 'Electricity (Connection Charges) Regulations: Consultation Document, June 2002 41/02. www.ofgem.gov.uk/docs2002/41elec_reg.pdf

reaction was to Ofgem's proposal, as set out in the March document.

4.29 Seven responses, including five from DNOs, indicated support in principle for the proposal. One DNO considered that the proposed changes could be of positive assistance in resolving problems of network management. Two DNOs having concerns about the cost and administrative burden of the associated record keeping expressed the only reservations.

4.30 One DNO considered that the proposed option of annualised charging would make such an amendment to the Regulations unnecessary. Ofgem's intention, however, has been to give generators a choice of payment method. It was clear from earlier consultations that not all would necessarily choose annualised charging.

4.31 Other issues identified in responses were:

- that DNOs would be unable to make refunds in respect of contestable connection work carried out by third parties;
- whether reimbursement should be time-limited or whether a limit on the number of connections contributing to refunds would be more appropriate; and
- whether the right to a refund should vest in the initial contributor or whether it should attach to the connected site (which might be sold before the subsequent connection was made).

4.32 It is anticipated that amendment Regulations could be brought into force in mid 2003.

Banding of distributed generation

4.33 Distributed generation covers a wide spectrum from large power stations to small, domestic-scale installations. Acknowledging the need to treat different groups differently – in accordance with their various characteristics – Ofgem's September 2001 consultation sought views on the bands or classes into which distributed generation might sensibly be divided. Responses suggested there to

be merit in taking this work forward, and in understanding how banding might relate to the development of distributed generation.

- 4.34 A general consensus emerged, from the responses to the March document, that there should be a specific band for micro-generation units, and that the smallest of these, at least, should be subject to type approval. Equally, a strong case emerged for a band covering the largest (possibly just EHV) connections. One response argued that banding should not inhibit the appropriate treatment of a distributed generator for the separate purposes of connection and charging and the resolution of technical problems.
- 4.35 In co-operation with the TSG's Workstream 2 the Distribution Code Review Panel (DCRP) issued a consultation paper on banding on 28 May 2002¹². The closing date for responses was 28 June. A pilot document, based on the responses to this consultation, has been placed on the DGCG website (www.distributed-generation.org.uk). It is intended periodically to review the suggested banding structure set out in that document – and certainly to do so in early 2003.

Metering arrangements

- 4.36 Responses from DNOs were generally in agreement with Ofgem that imports and exports of active power should be separately metered for all distributed generators. Six of them expressed clear support for it. One DNO considered that, without half-hourly metering (HHM), it would prove impossible appropriately to allocate costs to micro-generation customers. Ofgem is not persuaded that there would be difficulty in making such allocations, particularly as this is already satisfactorily achieved for demand customers with non half-hourly (NHH) metering.
- 4.37 The costs of HHM would not seem to be justified for such small users at present, but Ofgem would agree with one of the generators' responses that careful work needs to be done on creating profiles for use with this non-half-hourly data. It is understood that some work has already been done in this field. TSG Workstream 4 has initiated a project to consider metering and settlement aspects of micro-

¹² 'DCRP Consultation on Banding/Classification of Distributed Generation', www.ofgem.gov.uk/dso/cons_28may2002.pdf

generation. The TSG's work could feed into the broader consideration of new technology and metering policy advocated in the response from one group of energy companies.

- 4.38 Some responses from representatives of smaller generators and from companies with interests in the development of micro-generation equipment questioned the need for separate measurement of imports and exports from DCHP and micro-generation installations. One argued that the cost of metering could erode the financial benefit from small renewable generators, PV installations and DCHP. It suggested net metering as an alternative. Ofgem, however, remains of the view that net metering, with its significant risk of cross subsidy, would not be an appropriate option in a liberalised market. Indeed, there was little support for it in responses to Ofgem's September 2001 consultation on distributed generation.
- 4.39 Another response argued for profiling, without separate metering, of exports from small micro-CHP and PV installations of under 3kWe capacity. Ofgem remains of the view, however, that separate metering of imports and exports will be essential. There may be scope for reduction of the cost of meter installation – especially as a component of a single-visit installation of DCHP or PV equipment.
- 4.40 A supplier's response identified the metering and settlement of DCHP as important regulatory and market issues. Ofgem agrees that more work needs to be done on the settlement of spill units from micro-generation. It has been disappointing that consultations to date have prompted little comment from suppliers on their likely role in this area, and particularly how they might approach the valuation of spill units from this smallest class of generator. Ofgem would welcome views on this.

Existing distributed generation

- 4.41 Few responses commented on the position of existing distributed generators. Those that did were in agreement with Ofgem's view that existing arrangements should not be affected by the interim proposals. Requests for additional capacity could be dealt with as new generation (i.e. with the option of annualised charging). Site-specific consideration would be given to the implications of any capacity reduction.

Provision of information

- 4.42 Good progress has been made with the preparation of the Long-Term Development Statements required under standard licence condition 25 of the Distribution Licence. The statements indicate – over a five-year period – the likely use and development of the DNO’s network, including information about the existing distribution network, the predicted capacity constraints, opportunities for new connections and planned works. 10 of the 14 DNOs have voluntarily published interim statements, which Ofgem considers to be of high quality. In late August 2002 Ofgem issued the formal direction under the licence condition, requiring DNOs to publish a long-term development statement within three months.
- 4.43 Long-Term Development Statements (produced under the requirement in standard licence condition 25 of the distribution licence) are clearly the appropriate vehicles for the provision of network information for developers. However, there was some agreement with Ofgem’s suggestion that a ‘Plain English Guide’ to connection procedures would be helpful to prospective micro-generation users. Responses suggested that such guides would, in due course, be available in at least six DNO areas. It seems sensible, as one DNO suggested, to delay this work until the completion of Engineering Recommendation G83¹³.
- 4.44 Ofgem’s consultation papers of September 2001 and March 2002 both suggested that some DNOs would do well to look at best practice in the matter of Condition 4 statements. These are statements that set out the basis on which charges will be made for the provision of use of system and for connection to the system. As indicated in the earlier consultations, some DNOs’ statements are noticeably more helpful than others. Encouragingly, some DNO responses have expressed a willingness to review their statements along the lines suggested by Ofgem. It is difficult to understand the argument, advanced by at least one company, that it would be problematic to amend a statement intended as the basis for legal interpretation, and the form of which Ofgem has approved. Those

¹³ ‘Recommendation for the Connection of Small-Scale Embedded Generators (up to 16 A per phase) in Parallel with Public Low-Voltage Distribution Networks’, Electricity Association, draft May 2002. The Distribution Code Review Panel has written to Ofgem, seeking approval of a revised version of the Distribution Code with G83 included.

are characteristics of all Condition 4 Statements, including those that Ofgem regards as containing elements of best practice.

5. Issues for the distribution price control review and review of distribution charge structures

Introduction

- 5.1 The document of March 2002 set out a number of issues, not susceptible to interim solutions, that would have to be considered as part of the next distribution price control review. On 7 August 2002, Ofgem published a consultation document on the framework for price control of networks. That consultation will lead into work on the distribution price control review. Rather than attempting a comprehensive review of relevant issues, the purpose of this part is to set out particular issues highlighted in responses to the March 2002 document.
- 5.2 Two responses called on Ofgem to provide details of the next distribution price control review, including an outline timetable. One of them particularly mentioned the importance of identifying charging and incentive issues in advance of the submission of DNOs' business plans (probably in Summer 2003). Ofgem's consultation paper on the framework for price controls has since addressed these points. The open letter of 10 January 2003 also sought to develop thinking in advance of the next distribution price control review – particularly on developing appropriate incentives for the efficient and co-ordinated operation and development of distribution networks.

General approach

- 5.3 The response from an organisation representing small generators suggested that the distribution price control applying from April 2005 should provide for:
- inclusion of connection, and associated reinforcement, assets in the RAB;
 - a shallow connection policy with generator UoS charges; and
 - procurement of, and payment for, the benefits of distributed generation.

- 5.4 A DNO stressed the importance of making sufficient provision under the price control for the introduction of active network management and control systems, and for the development of associated skills in the workforce.

Use of System charges

- 5.5 A DNO response questioned the validity of comparison, in this context, with NGC's zonal charges and suggested that such charge structures were not a viable option for distribution networks. DNO networks were significantly different from transmission networks in important respects that made modelling of network costs for zonal charging uneconomic. These differences were:

- the local nature of constraints, such that 11kV constraints can vary significantly over as little as two or three kilometres;
- distributed connection options, at any given location, cover more than one voltage level and are subject to constraints from up to three geographically overlapping networks; and
- the rate of change on the system.

- 5.6 These arguments have some force, but Ofgem sees merit in further discussion of the options for zonal charging. In time, it will be necessary to address the consequences of parts of networks accommodating considerable amounts of distributed generation and being more actively managed than other areas. To the extent that these subdivisions of networks will exhibit cost profiles different from those of passively managed networks, different charging structures may be appropriate. It is, nevertheless, recognised that the introduction of zonal charging could produce price disturbance and would require changes to suppliers', settlements and DNOs' systems.

Entry and exit charges

- 5.7 The response from an organisation representing renewable generators advocated a shallow approach to connection charging combined with UoS charges for entry and exit at all levels. This, it was argued, had been tried at transmission voltages and could reflect the costs and benefits of generation and supply to the network.

5.8 Another response supported this view, pointing out that EGWG had stressed the importance of creating an incentive for DNOs to adopt a more flexible and 'active' approach to network management. It argued that the most economically efficient way to achieve this would be to adopt charging methodology featuring:

- a shallow connection charging regime;
- entry and exit charges; and
- performance measures linked to revenue.

5.9 One DNO response strongly advocated entry and exit charges, which would make up approximately 15% - 20% of total UoS revenue. The proposed charging regime would comprise:

- entry charges for power entering the network both from transmission grids and distributed generation (recovering entry-associated connection and service costs, metering point administration (MPAS) costs, billing costs etc);
- exit charges (recovering exit-associated service/connection, MPAS costs, billing costs etc.); and
- transportation charges, reflecting:
 - asset and equipment costs for each voltage level between entry and exit points;
 - operating and maintenance costs as a percentage of capital at each voltage level;
 - incremental costs of network reinforcement (£/kWh/annum);
 - kWh/kW calculated at each voltage level¹⁴; and
 - operational rates¹⁵ charged on the basis of transformer capacity.

¹⁴ In effect, this is similar to system load factor, although it is the result of the calculated kWh/kW rather than adjusting it to a percentage taking account of the time period.

¹⁵ i.e. local authority business rates charged on transformer sites.

5.10 Another DNO response took the opposing view, suggesting that the calculation of entry and exit charges would be 'overly complex' and likely to inhibit the widespread take-up of distributed generation. The company suggested that such charges might be developed after the connection of significant quantities of distributed generation and when other charging mechanisms were starting to prove inadequate.

Longer-term issues

5.11 A response from an organisation representing small generators recognised that active management of distribution networks may require DNOs to procure ancillary services. Mechanisms will need to be put in place to facilitate this. The response recommended that one of the DGCG's workstreams should investigate possible options.

5.12 Also commenting on the possible provision of ancillary services by distributed generation, another response emphasised the need for consistency between services offered by distributed generators and the services now provided by transmission-connected generation. In particular it would be necessary to consider the compatibility of any new mechanism with NGC's balancing services incentive arrangements and BSUoS charging framework.

5.13 Since Ofgem received these responses, the TSG's Workstream 5 (Long-Term Network Concepts and Options) has established a project to advise on a range of EGWG's recommendations, specifically including options for the development of an ancillary services market at distribution level.

Network access

5.14 An organisation representing renewable generators emphasised the importance of taking account of distributed generation when revising transmission access arrangements. Their response argued, in particular, that:

- the environmental benefits of transmission network avoidance are best delivered by localised, renewable generation;
- distributed generation is an alternative solution to transmission constraints;

- demand-side access rights have a major influence on 'embedded benefit'; and that
- locational factors in transmission charging should not damage the development of renewable generation.

5.15 Echoing the last of these points, a major embedded generator pointed out that proposed zonal arrangements for transmission losses took no account of the local absorption of the output from distributed generation. This response argued that such signals should be aimed at transmission-connected generation and that distributed generation, which might be able to provide local network support, should not be subject to national locational signals.

5.16 On firmness of connection, a generators' organisation took the view that connections should initially comply with prevailing standards. Connections of a lower standard should be the subject of negotiation between DNO and prospective generator, although the expectation signalled in the response was that generators would, in most circumstances, receive a discount for accepting a lower standard of connection.

5.17 From a different perspective, a DNO argued that generation DUoS charges should cover only the basic level of security of connection. Any reinforcement for an enhanced level of security should, the company suggested, be recovered in the connection charge.

6. Other workstreams

Introduction

- 6.1 While acknowledging that many issues would have to await consideration as part of the distribution price control review, the paper of March 2002 identified a number of matters that could be taken forward in advance of it. This part of the paper covers the responses relating to those issues.

Changing conditions

- 6.2 The paper of March 2002 suggested that it would be important to consider when increased levels of distributed generation might be expected to change the conditions underlying the existing approach to price controls. This work is being taken forward in:

- preliminary consultation on the framework of price controls; and
- by the TSG's Workstream 1 (Distributed Generation: Status and Projections).

- 6.3 Only two responses (both from DNOs) addressed this question. The first reported that small parts of its network already experienced reverse power flows and that those sections of network were actively managed. The response emphasised, however, that these conditions applied to only a small percentage of the company's network. It did not yet seem possible to forecast when such situations would be sufficiently widespread to merit different treatment under price controls.

- 6.4 The second response identified a number of pieces of work to be addressed in the shorter-term, although it did not suggest how the timing of any given change might be forecast. It is anticipated that the TSG's Workstream 3 (Short-term Network Solutions) will be addressing these questions, which include:

- understanding the capabilities of key network components;
- use of limited real-time data to run operational models in a controlled environment;

- derivation of specifications for new and replacement plant more aligned to bi-directional power flows;
- securing a better understanding of the likely impact of micro-generation on networks; and
- the introduction of relatively simple design and operational management techniques.

6.5 The same response suggested that longer-term changes might centre on the potential benefits of islanded operation, particularly in terms of quality of supply. Beyond that, there are prospects of network reconfiguration to produce 'network cells' that would be almost autonomous in terms of generation, energy storage, voltage and frequency management etc. Such cells might have relatively weak interconnections to adjacent cells. The likely timing of longer-term developments of this sort is clearly even harder to predict.

Consultation on Engineering Recommendation P2/5

6.6 The TSG's Workstream 3 (Short-term Network Solutions) is currently working on possible amendments to ER P2/5. Preliminary work is focussing on possible amendments to Table 2 of P2/5, which sets out the contribution to security of supply to be expected from generation connected within a demand group. Initial decisions are expected in January 2003, although further work will be necessary beyond that date. Ofgem has consulted separately¹⁶ on the wider issue of the governance of electricity standards. This governance project will not impact directly on the initiatives set out in this paper, although it may, in time, make it easier for third parties to influence changes in technical standards.

6.7 A DNO's response noted that changes to P2/5 could make it easier for DNOs to recognise a security benefit from the types of generation likely to be connected at distribution voltages. As networks were already designed to be P2/5 compliant, however, the changes envisaged would not immediately result in a significant value to generators.

¹⁶ 'Governance of Electrical Standards', Ofgem, 30 April 2002. www.ofgem.gov.uk/public/pub2002.htm

- 6.8 On 16 December 2002 the TSG's Workstream 3 issued a consultation proposing a methodology for amending Table 2 of ER P2/5 to make it applicable to modern generation types. The deadline for responses to this consultation is 31 January 2003. The consultation papers can be found in the 'Technical Steering Group Papers' section of the DGCG website (www.distributed-generation.org.uk)

Benefits of distributed generation

- 6.9 No response specifically addressed the likely benefits of distributed generation. The TSG's Workstream 5 (Long-term Network concepts and Options) will be considering the impact of distributed generation on networks. Workstream 1 (Distributed Generation: Status and Projections) has identified a range of scenarios that will be helpful in taking forward this sort of analysis.
- 6.10 As a related but separate piece of work, Ofgem is considering whether current market conditions allow an appropriate sharing of the 'embedded benefits' between distributed generators and supply companies. This initiative subdivides into two workstreams. The first involves forming a view as to whether the bargaining power of suppliers disadvantages distributed generators in this respect. This requires analysis of the concentration of suppliers purchasing output from distributed generation and of seeking assurance that those suppliers have appropriate internal procedures in place to ensure compliance with the Competition Act 1998.
- 6.11 The second workstream involves ascertaining whether it is feasible to facilitate direct payment of 'embedded benefits' to distributed generators – within the framework of the existing Transmission Network Use of System (TNUoS) charging regime. Consideration of the detail of data flows (e.g. metered data volumes), payment paths and contractual relationships is in train.

Standardisation for DCHP

- 6.12 Ofgem's paper of March 2002 identified a need for simple, workable and comprehensible arrangements for DCHP installations. Several responses commented on this. There seems to be consensus to the effect that DCHP constitutes an identifiable class of distributed generation for which type approval

and user-friendly connection and operating arrangements would be appropriate. Provided that installations are of the approved pattern, complex installation requirements involving site inspection would appear to be unnecessary. It may be sensible, as one response suggested, to derive comparable arrangements for domestic photovoltaic arrays. The TSG's Workstream 4 (Micro-generation Solutions) is now well ahead with its work on DCHP, and should be able to report preliminary conclusions to the DGCG by early 2003.

6.13 A major hurdle in delivering customer-friendly, single-visit installation will be the training and accreditation of installers. A number of responses touched on this issue, suggesting competencies that would include:

- compliance with the Electricity (Safety, Quality and Continuity) Regulations 2002;
- compliance with The Gas Safety (Installation and Use) Regulations 1994 and The Gas Safety (Installation and Use) Amendment Regulations 1996, which govern work carried out downstream of the meter control¹⁷;
- compliance with the current edition of the wiring regulations (BS7671); and
- accreditation as a meter operator.

Performance standards for connection quotations

6.14 Ofgem's paper of March 2002 mooted the possibility of setting performance standards to reduce the cost and to improve the timeliness of DNOs' responses to connection requests. Four DNOs commented.

6.15 Doubting whether standards would necessarily bring any benefit in terms of efficiency or transparency, one DNO emphasised the need for careful investigation to safeguard network security and cost recovery. Another DNO said that it would support some sort of overall process monitoring measure, but did not see a case for a penalty-based regime.

¹⁷ These Regulations – together with The Gas Safety (Management) Regulations 1996, which apply 'upstream of the meter' - are currently being reviewed by the Health and Safety Executive.

- 6.16 Ofgem acknowledges the importance of careful investigation of connection options. However, DNOs seem not to take account of some of the customer experiences of which Ofgem is aware. An example – reported while this document was in draft – concerned a prospective small generator who claimed to have completed an application for connection in early January 2002. By mid July there had apparently been no reply from the DNO, despite the customer's having made some 20 telephone calls to the contact that he had been given. Against this sort of background it is difficult to accord much weight to DNOs' arguments that penalty-based standards would be ineffective.
- 6.17 A genuine problem faced by DNOs was set out in another response. It is that of 'immature', insufficiently well-formulated applications requiring multiple iterations of analysis.
- 6.18 A positive step reported by one DNO is the introduction of a free 'quick look' service, involving round-the-table discussion with a prospective generator to make a preliminary network assessment aimed at shortlisting suitable sites in relation to potential connection costs. Where there is some flexibility over location, this sort of service could be of solid benefit in reducing the time and cost associated with connection charge quotations.
- 6.19 Ofgem will be consulting separately on performance standards relating to connections.

'Registered Power Zones'

- 6.20 The March document suggested that, if an appropriate mechanism could be found, it might be helpful for DNOs to signal to prospective generators that connection to certain parts of the network would be beneficial to all parties. The document invited discussion of 'registered power zones' (RPZs) where DNOs could plan and invest in anticipation of connection of distributed generation.
- 6.21 A Power Zone is envisaged to be a defined electrical, and perhaps geographic, area that is proposed by the DNO and forms a 'bounded network'. In this context, 'zones' do not refer to charging or constraint zones as used in the transmission frameworks. Within a Power Zone, a DNO could apply new technologies, technical solutions and operating practices, as well as pilot new

commercial structures, to exploit the possibilities for distributed generation to improve quality of supply, reduce losses, minimise constraints to generator operation, and ultimately enable the network to be run at a lower overall cost. Power Zones could also provide a framework in which Ofgem could encourage, in a controlled manner, DNO initiatives in relation to distributed generation by specific regulatory treatment such as appropriate treatment of costs that are incurred and other incentives.

- 6.22 The response from an organisation representing small generators was supportive of the creation of RPZs – provided that their creation would not unfairly discriminate against generation connected elsewhere on the system and provided that resources were not diverted from work on other parts of the network.
- 6.23 A DNO regarded the RPZ concept as workable, but pointed out the need for appropriate treatment of ‘up-front’ costs. This company also made the point that planning considerations frequently presented a greater obstacle to distributed generation than did the level of connection charges. There would be benefits in involving planning authorities in designating areas as suitable for the development of electricity generation. A second DNO saw merit in RPZs as offering an opportunity to evaluate, on a small scale, changes that are likely to become far-reaching in the longer term.
- 6.24 Another DNO regarded the RPZ concept as a different way of approaching incentives to connect distributed generation. It would be logical and efficient to prioritise network development in this way. This response suggested that detailed technical and commercial issues should be left to individual DNOs but that the question of incentives needed to be addressed centrally.
- 6.25 There is evidence that some DNOs have begun to think in terms similar to the RPZ idea. One reported consideration, during the early stages of planning new business parks, of:
- installing communications cables alongside new 11kV distribution circuits, in anticipation of the requirements of more active network management;

- reviewing the 11kV protection and switchgear configuration to allow networks to operate as closed rings, providing enhanced security for both generation and demand customers;
- reviewing the policy on tapering mains and services, so as to reduce circuit impedance and reduce the effect of generator-induced voltage rise;
- restricting the length of 11kV circuits – again to reduce voltage rise; and
- accommodating fault level contribution from distributed generation by ensuring that equipment (notably cables, joints and terminations) are suitable for enhanced fault level capability.

6.26 A possible way of dealing with these issues would be to create RPZs which could be designed to complement the existing regulatory framework and to facilitate its development in response to DNOs who seek to deploy new technologies and commercial arrangements. Further details were set out in Annex 2 to the open letter of 10 January 2003.

6.27 A number of issues that need to be considered in developing incentives relating to Power Zones include:

- whether they are helpful in addressing the challenges and opportunities raised by distributed generation;
- how can they help DNOs meet the statutory and licensed obligations including facilitating competition in generation;
- how to ensure that the network investment is efficient and effective in facilitating renewables and CHP;
- how to encourage innovation without Ofgem's being involved in "picking winners";

- how to encourage effective risk management, including safety, technical and commercial factors and what criteria could be applied to measure the quality of a Power Zone proposal; and
- whether there should be a controlled development via e.g. a limit on the number or value of Power Zones in order to evaluate and develop principles in the light of early experience.

6.28 The driver for establishing Power Zones is to provide a framework (regulatory, technical and commercial) that encourages and enables DNOs to:

- prepare to play their part in responding to demands of their customers and helping to meet the Government's targets for renewables and CHP;
- seek out the most efficient network solutions and, where appropriate, to transform parts of their networks to active operation;
- deploy new technologies that enable distributed generation to be integrated successfully; and to
- help meet their statutory obligations to consumers and for facilitating generation competition.

6.29 Power Zones could provide an opportunity for DNOs to develop commercially and technically innovative network solutions to the challenges and opportunities provided by distributed generation. If Power Zones are developed Ofgem will need to ensure that the impact on consumers is understood and that companies are provided with the right incentives.

TNUoS for distributed generation

- 6.30 Paragraph 8.24 of the March document briefly mooted the desirability of developing a single policy on transmission use of system (TNUoS) charges for distributed generators in Great Britain, rather than separate arrangements for England & Wales and Scotland. Only one response – from a DNO – commented on this, briefly to support the proposal.
- 6.31 One of the principal building blocks of the development of British Electricity Trading and Transmission Arrangements (BETTA) is the introduction of GB charging methodologies for connection to and use of the transmission system. In Ofgem's May 2002 next steps paper¹⁸ it was noted that respondents supported the development of GB charging but identified the need for consultation on the detailed form of these arrangements. In the May paper, Ofgem said that it would use the arrangements applying in England and Wales as the basis for consultation.
- 6.32 The charging methodology for connection to and use of the transmission system in England and Wales allows for distributed generators to negotiate commercial benefits where the generation reduces a supplier's TNUoS or BSUoS charges. The extension of such arrangements would form an important part of the consultation on the proposed GB transmission charging arrangements.
- 6.33 In Scotland, the transmission system includes lines operating at lower voltages (132kV) than in England and Wales. In consulting on GB arrangements, consideration will need to be given to the implications of this for generators in Scotland connected at this lower voltage – in comparison with similar generators located in England and Wales.

¹⁸ 'The development of British Electricity Trading and Transmission Arrangements (BETTA): Report on consultation and next steps', Ofgem/DTI, May 2002.

Appendix 1 Revised timetable

Recommendation ¹⁹	Planned action	Declared timescale for completion	Current status
Facilitation of competition			
Review of incentives on DNOs	<ul style="list-style-type: none"> • Ofgem's consultations on 'Distributed generation: price controls, incentives and connection charging' (September 2001 and March 2002) • Ofgem seminar on renewables and networks • Summary of responses to March 2002 consultation • Ofgem consultation on framework for price control of networks • Ofgem consultation on distribution charge structures • Distribution losses project 	<ul style="list-style-type: none"> • Mid 2002 • 10 Sep 02 • by end Sep 2002 • Aug 02. Statement document in Mar 03 • Update Oct 02. Statement document in Jun 03 • Jun 03 	<ul style="list-style-type: none"> • Interim proposals of March 2002 now being implemented • Achieved • Achieved • Published 7 Aug 02 • Update document published 24 Oct 02 • Consultation document awaited
Connection process guide	<ul style="list-style-type: none"> • Action with Technical Steering Group (TSG) Workstream 2 (WS2) 	<ul style="list-style-type: none"> • Publication Apr 03 	<ul style="list-style-type: none"> • Start delayed due to need to include developments to early 2003
Establish commercial forum	<ul style="list-style-type: none"> • Distributed Generation Co-ordinating Group (DGCG) established • TSG established 	<ul style="list-style-type: none"> • Nov 01 • Jan 02 	<ul style="list-style-type: none"> • Achieved • Achieved

¹⁹ See the report of the Embedded Generation Working Group (EGWG), published by DTI on 12 January 2001.

	<ul style="list-style-type: none"> Commercial forum on electrical standards for connection of distributed generation 	<ul style="list-style-type: none"> [DATE TO BE FIXED] 	<ul style="list-style-type: none"> Ofgem's consultation summary on governance of electrical standards recommended that the industry consider establishing such a forum.
Assessment of contribution from distributed generation			
Review of Engineering Recommendation P2/5	<ul style="list-style-type: none"> Action on Table 2 with TSG WS2 and WS3 Ofgem consultation on governance TSG WS2 project to co-ordinate industry action 	<ul style="list-style-type: none"> Technical work by May 03. Formalisation by Sep 03 Apr 02 with conclusions in Oct 02 Oct 02 – Apr 03 	<ul style="list-style-type: none"> On target. Requires Ofgem to approve D Code modification (Jul 03) and to consult (Aug 03) on licence modification. Follow-up work in progress in the Distribution Code Review Panel Planned
Security services study	<ul style="list-style-type: none"> Longer-term review of security contributions anticipated from TSG WS5-P04 	<ul style="list-style-type: none"> [DATE TO BE FIXED] 	<ul style="list-style-type: none"> Project initiated
Power quality, voltage and ancillary services studies	<ul style="list-style-type: none"> Power quality actions with TSG WS5-P07. Ancillary services action with TSG WS5-P06 	<ul style="list-style-type: none"> [DATE TO BE FIXED] Initial report Sep 03 	<ul style="list-style-type: none"> Project initiated Project initiated
Islanded operation	<ul style="list-style-type: none"> Action with TSG WS5-P05 	<ul style="list-style-type: none"> [DATE TO BE FIXED] 	<ul style="list-style-type: none"> Project initiated
Network design and practice analysis	<ul style="list-style-type: none"> Action with TSG WS5-P08 	<ul style="list-style-type: none"> [DATE TO BE FIXED] 	<ul style="list-style-type: none"> Project initiated
Basic active management assessment	<ul style="list-style-type: none"> Opportunities and guidance on best practice on basic active management with TSG WS3 Longer term concepts and options to be considered by TSG WS5 	<ul style="list-style-type: none"> Proposals to DGCG by Dec 02 [DATE TO BE FIXED] 	<ul style="list-style-type: none"> Project initiated Project proposal drafted.

Establish ancillary services market forum	<ul style="list-style-type: none"> • DGCG to advise later on timing for this action 	<ul style="list-style-type: none"> • To be decided 	<ul style="list-style-type: none"> • N/A
Charging principles			
Identify short-term changes	<ul style="list-style-type: none"> • Interim proposals in Ofgem's distributed generation paper of March 2002 	<ul style="list-style-type: none"> • Mar 02 	<ul style="list-style-type: none"> • Achieved
Statement of intent by Ofgem	<ul style="list-style-type: none"> • Interim proposals in Ofgem's distributed generation paper of March 2002 • Ofgem consultation on framework for price control of networks 	<ul style="list-style-type: none"> • Mar 02 • Aug 02. • Statement document Mar 03 	<ul style="list-style-type: none"> • Achieved • Published 7 Aug 02 • On target
Development of charging options	<ul style="list-style-type: none"> • Ofgem consultation on framework for price control of networks • Ofgem consultation on distribution charge structures 	<ul style="list-style-type: none"> • Aug 02. Statement document in Mar 03 • Oct 02. Statement document in Jun 03 	<ul style="list-style-type: none"> • Published 7 Aug 02 • Published 24 Oct 02
Regulatory arrangements for next DPCR	<ul style="list-style-type: none"> • Ofgem to propose framework arrangements after consultation 	<ul style="list-style-type: none"> • Completion by Feb 03 	<ul style="list-style-type: none"> • On target
Provision of information			
Scoping for DNO network long-term development statements	<ul style="list-style-type: none"> • Interim statements from DNOs • Formal slc 25 direction • TSG WS2 to co-ordinate industry review 	<ul style="list-style-type: none"> • Summer 02 • Aug 02 • May 03 	<ul style="list-style-type: none"> • Received from 10 DNOs • Achieved • Planned
Value balance assessment as part of scoping study	<ul style="list-style-type: none"> • Integral to the above 	<ul style="list-style-type: none"> • Integral to the above 	<ul style="list-style-type: none"> • Achieved
Information and connection process standard information	<ul style="list-style-type: none"> • Action with TSG WS2. Output will be Distribution Code changes and best practice guidance. 	<ul style="list-style-type: none"> • Feb 03 	<ul style="list-style-type: none"> • Project initiated

Micro-generation issues			
Connection standards for micro-scale generation	<p>TSG WS4 includes:</p> <ul style="list-style-type: none"> • Engineering Recommendation G83 and G83/1 • CEN Workshop Agreement on “Electrical interface for domestic cogeneration” 	<ul style="list-style-type: none"> • Oct 02 and Feb 02 • Formalisation Sep 04 earliest 	<ul style="list-style-type: none"> • Work in progress in Electricity Association • CWA finalised and passed to CENELEC. CENELEC committee formed and work just commencing.
Connection charging principles	<ul style="list-style-type: none"> • Interim proposals in Ofgem’s distributed generation paper of March 2002 • Ofgem consultation on framework for price control of networks 	<ul style="list-style-type: none"> • Mar 02 • August 2002. Conclusions document March 2003 	<ul style="list-style-type: none"> • Achieved • Published 7 Aug 02
Metering and charging options analysis	<ul style="list-style-type: none"> • Ofgem’s policy set out in the distributed generation paper of March 2002 • TSG WS4 – project on metering requirements and export reward. (The BSC requirement for HHM is to be removed with effect from 28 Sep 03) • TSG WS4 – project on legal, commercial and regulatory aspects 	<ul style="list-style-type: none"> • Mar 02 • Conclusions in May 2003. • Initial proposals on the way forward by end 2002. Aim for implementation of changes by Apr 03. 	<ul style="list-style-type: none"> • Achieved • Project initiated • Project initiated
Impact on the BSC	<ul style="list-style-type: none"> • General impacts included in the above • Elexon considering BSC modification P81 to remove half-hourly metering requirement 	<ul style="list-style-type: none"> • See above • 28 Sep 03 	<ul style="list-style-type: none"> • See above • Work in progress for implementation (Elexon)

Future network issues			
Establish working group to consider future possibilities	<ul style="list-style-type: none"> • TSG WS5 covers long-term network concepts and options 	<ul style="list-style-type: none"> • Initial conclusions by Feb 03. 	<ul style="list-style-type: none"> • Project specifications drafted
Connection charging	<ul style="list-style-type: none"> • Ofgem consultation on framework for price control of networks • Ofgem consultation on distribution charge structures 	<ul style="list-style-type: none"> • Aug 02. Statement document in Mar 03 • Oct 02. Statement document in Mar 03 	<ul style="list-style-type: none"> • Published 7 Aug 02 • Update document published 24 Oct 02
Regulation and incentives on DNOs	<ul style="list-style-type: none"> • Ofgem consultation on framework for price control of networks • Distribution losses project 	<ul style="list-style-type: none"> • Aug 02. Statement document in Mar 03 • Jun 03 	<ul style="list-style-type: none"> • Published 7 Aug 02 • Consultation paper awaited
Ancillary services market	<ul style="list-style-type: none"> • TSG WS5-P06 considering technical aspects • Ofgem considering wider commercial and regulatory implications 	<ul style="list-style-type: none"> • Initial report Sep 03 • Initial views by Mar 03 	<ul style="list-style-type: none"> • Project specification drafted • Work at an early stage.
Commercial mechanisms for active management	<ul style="list-style-type: none"> • TSG WS5-P06 considering technical aspects • Ofgem considering wider commercial and regulatory implications 	<ul style="list-style-type: none"> • [DATE TO BE FIXED] • Initial views by Mar 03 	<ul style="list-style-type: none"> • Project specification drafted • Work at an early stage.
Co-ordinated R&D	<ul style="list-style-type: none"> • For consideration later 	<ul style="list-style-type: none"> • Timescales to be decided 	<ul style="list-style-type: none"> • Work not yet started

Appendix 2 : Organisations that submitted responses to the document of March 2002

East Midlands Electricity
Energy Saving Trust
BG Group
British Gas Transportation Services
GPU Power Networks (UK) plc
Innogy plc
LE Group
Dr Catherine Mitchell, Centre for Management Under Regulation, Warwick Business School, University of Warwick
National Grid Company plc
Northern Electric Distribution Ltd
Powergen UK plc
Renewable Power Association
Seeboard plc
Scottish Power
Scottish Renewables
Scottish and Southern Energy plc
TXU Energy
United Utilities plc
Western Power Distribution
Yorkshire Electricity Distribution plc

There was one additional response, which the author asked Ofgem to treat in confidence.