Ofgem - Electricity Distribution Price Control Review Policy Paper

Senergy Econnect Response

Senergy Econnect Project No: 1987

Prepared For	DPCR5 Response Electricity Distribution Ofgem 2nd floor 9 Millbank London SW1P 3GE

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1 Purpose of this document

This document is Senergy Econnect's response to Ofgem's policy document on the 5th Electricity Distribution Price Control Review (DPCR5), as invited in document Ref: 159/08 published on 5th December 2008, with a deadline for submission of 13th February 2009.

Senergy Econnect wishes to respond to two principal questions in the Environmental section, focusing on the provision of network information to developers of distributed generation sites and innovation and flexibility in distribution networks.

The specific questions and sections of the policy document addressed are as follows:

1) Environmental section: Question 2 , information provision
   - Distributed Generations and barriers for their connection (sections 2.25 to 2.29)
   - Appendix 6 – Environment, information requirements for Distributed Generation (sections 1.31 to 1.36)

2) Environmental section: Question 5, innovation in networks
   - Ability to connect and cost of connection (sections 2.22 to 2.36)
   - Innovation mechanisms (sections 2.61 to 2.75)

1.1 Confidentiality

Our response is not confidential and can be published by Ofgem as outlined in the policy document.

1.2 Senergy Econnect Ltd

Senergy Econnect's activities are focussed on the grid integration and electrical engineering of renewable energy. We have been involved with about half of the wind energy capacity connected to electrical grids of Great Britain over the last 15 years. Senergy Econnect recently completed a study with National Grid for the Crown Estate on the connection 25GW of Round 3 offshore windfarms.

Senergy Econnect has offices in UK, Melbourne Australia, Wellington New Zealand and Dublin Ireland. We recently completed a guide to the connection of Distributed Generation to the Irish Networks for Sustainable Energy Ireland.

Senergy Econnect operates the web site www.gridconnection.co.uk with its partner Imass to provide connection design and costings for potential generators. Senergy Econnect has developed GenAVC™ an active network management technology deployed to reduce connection costs on the 11kV networks. We have been involved in numerous innovative island grid networks in the Scottish islands bringing cost effective and low carbon power to these remote communities.

1.3 Challenges of EU renewables targets and carbon reduction

Senergy Econnect recognises the serious challenges posed by the carbon reduction and renewable energy targets taking UK from 1% renewable energy to 15% in 12 years. Senergy Econnect believes that there will be significant changes on electricity networks due to increasing use of Distributed Generation (DG) of all types and to changes in demand levels and patterns through the use of electric heating and electric vehicles.

2 Information provision for Distributed Generation

2.1 Ofgem Question 2

What are your views on our proposals for DNOs to provide more information to help low carbon initiatives and have we adequately identified and defined the information requirements?

2.2 Distribution Generation operator requirements (section 2.27)

2.2.1 Ofgem proposal

2.27. We recognise that different types of DG operator will have different information requirements. We are therefore minded to mandate a package of measures to enable all customer types to obtain easy access to information tailored to their competence level and need for technical detail. The package aims to improve information provision along three dimensions (full details of the proposals are included in appendix 6):

- Improve accessibility and greater standardisation of available information,
- Targeted guidance on the connection process and opportunities, and
- Provide indicative connection costing tools (e.g. web calculator, heat maps).

2.2.2 Senergy Econnect Response

If renewable energy target are to be met then the Ofgem proposal to enable better provision of data for all customer types to assess their potential for connection to the grid is vital.

Senergy Econnect has been extensively involved in gathering and processing raw information available from the Distribution Network Operators (DNOs) in the form of the Long Term Development Statements (LTDS). The data published is both highly technical and detailed and requires significant effort to process it into meaningful information, whether this is carried out by a person (via engineering consultants) or a machine (automatic web delivery). Good quality raw data is essential to ease the process of interpretation, particularly when automation tools are based on that data. This data needs to be more current and consistent, at least within each network area.

Some users do not have the required knowledge to process this raw data and interpretative tools are essential. Delivery through the internet is the most effective medium and Senergy Econnect has already identified and developed tools providing indicative costing and network capacity. These tools are available now on a commercial basis (www.gridconnection.co.uk) and there is great potential for building on the work already completed to provide further on-line facilities to the UK industry via appropriate sponsorship.

Senergy Econnect recognises that certain advanced users are capable of undertaking their own interpretation of raw data. However, these users would benefit from cost and time saving tools and hence this would increase competition in the market and lower costs.

Standardisation of information could take place at several levels. The raw data could be standardised in its format in order to facilitate interpretation, although Senergy Econnect acknowledges that there are practical difficulties for network operators to standardise at this level as their systems have evolved independently and are at different stages of advancement. The interpretation methods could also be standardised, which would be of particular benefit to the customers, acknowledging some differences in practices applied to different parts of the network. An industry consensus on methodology would be easier to achieve than at the raw data level and

its delivery could then be automated. This is an area where Senergy Econnect has a lot of experience and would be able to provide suitable end user tools for part or whole of industry in collaboration with key players.

2.3 Information provision to Distributed Generation Developers (sections 2.28 and 2.29)

2.3.1 Ofgem proposal

2.28. Under the proposals the LTDS would remain a technical document intended for high voltage DG. There will then be less technical information specifically tailored for those DG operators connecting at lower voltage levels that may want information about the connection process and high level indicative connection costs.

2.29. We consider that much of the information is already held by the DNOs and as a matter of good commercial practice we would expect this to be shared with customers. Hence, we expect some of the information can be made available by the beginning of DPCR5 (e.g. the updated DG Connection Guide). We acknowledge that some of the remaining documents and proposed tools will need time to develop.

2.3.2 Senergy Econnect Response

Data at 11kV and below which is not currently published under the Long Term Development Statement framework is too large to publish in full without a database/query electronic / web download system (see statistics in Figure 1). In our experience network operator systems are not currently able to deliver to a harmonised standard, but electronic data which is consistent within each DNO area, is essential.

At present there are no incentives for network operators to publish good and consistent data. We have certainly encountered errors in some network operator data which impacts its usability. Providing regular updates is also becoming more important because new generation connections impact on future connections.

GB Network data

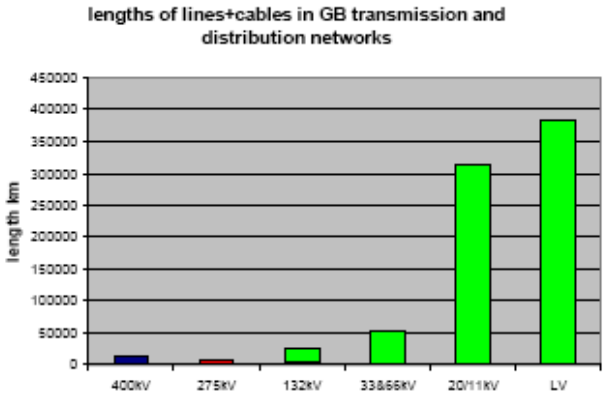
24,000km of transmission assets

- published in SYS

= 3% of network km

72,000km of DNO assets in LC25

= 9% of network km



www.econnect.com

Figure 1: Statistics on network data volume

2.4 Specific action for data provision (Appendix 6, section 1.35)

2.4.1 Ofgem proposal

1.35. Specific actions we are proposing to include:

a. Improve accessibility of LTDS - full version to be made available, for free, online, with location clearly flagged from front screen,

b. Standardise LTDS format and data form, linking it with annual cost reporting,

c. LTDS to remain a technical document, but to include a section headed 'Information on connection process and costs', with links to relevant documents or tools such as the connection charging methodology and the Energy Network Association's (ENA's) DG Connection Guide11. We expect this to be readily implemented by April 2010,

d. DNOs to commit to produce and maintain updated guidance document such as ENA's DG Connection Guide, suitable for all DG customer types (dedicated chapters by voltage level, technology, etc),

e. DNOs to provide access to web-based indicative connection costing information. We expect DNOs to provide this web-costing service for free, and be able to recover costs efficiently incurred in doing so,

f. DNOs to provide maps of 11kV circuits and heat-maps showing available capacity and best location for DG connections,

g. DNOs to publish lists/maps of the best (therefore lowest cost) connection locations by voltage level,

h. DNOs to complement their connection charging methodology statement with specific examples of DG connections (common across DSAs), from urban microgeneration to 50MW CHP, from windfarm to landfill, detailing assets involved in a representative minimum cost connection scheme for each type of DG and providing indicative unit cost for each (£/m cable, £/kit transformer, etc),

i. DNOs to make available leaflets and/or web pages explaining - in plain English - how and where DG is likely to provide network benefits as opposed to adding network constraints.

2.4.2 Senergy Econnect Response

On points a. and b.
Improving the accessibility of Long Term Development Statements and standardising the format and data form is something that we would welcome. Senergy Econnect has worked with the Long Term Development Statements since they were first introduced. Since the development of the www.gridconnection.co.uk tool the company has been accessing LTDS data with a view to standardising the material and the data capture.

We would like DNOs to be incentivised to

- highlight all changes in data since the last version of the LTDS
- Provide data in standard and consistent electronic formats

Together with our partner, Imass, we have seen the need to provide an electronic capture of the changes in the LTDS by each DNO and the potential exists to facilitate this effort through the use of database tools that now exist.

On point c.
As part of the package of information on connection process and costs, links to documents and existing tools, such as provided by www.gridconnection.co.uk, would provide the user with a balanced view of the connection issues at the earlier stages of their site development.

On point e.
Together with our partner firm Imass we have created a web-based tool that provides connection options and cost estimates for HV connections of generation. This has been developed using a combination of private and government funding in support of the Renewables strategy and support from some key DNOs. This product was deemed to be impossible to develop by several DNOs but is now commercially available. The product generates a report, maps and significant background data to support the outcome.

In developing this tool we have become very aware of the challenges and pitfalls and have developed and improved the tool with feedback from DNOs and customers and these improvements are ongoing.

We would recommend a standard GB tool in preference to individual DNO tools as this will:

- Provide connection options into multiple DNO areas where connections are on DNO boundaries.

- Provide users with a single interface to use, a standard output, standard costing and single location to store their projects, where developers are working across several DNO areas.

We would suggest that Ofgem consider allowing a small nominal charge for the use of such a service rather than a totally free offering. In our experience, valuable data can be gathered from user activity which could be devalued if users are simply exercising the system (e.g. for student projects). The user activity data can be used for predicting future network reinforcement requirements which can reduce overall network investment costs.

We note that a tool providing 11kV (inc. 20kV and 6.6kV) connection costs will be more challenging as:

- 11kV data is not yet published by DNOs.
- 11kV data is vastly more extensive than >33kV data.
- Operational data on 11kV networks is not always recorded.
- More 11kV network connection options may exist and require assessment.

Senergy Econnect would welcome discussions with DNOs as to how we could assist them in meeting any requirements under the section of the DPCR.

On point f.

Heat maps information would not necessarily coincide with DNO boundaries and therefore a common GB system supported by the DNOs would be preferable to individual DNO maps.

On points f. and g.

Publishing data on best and lowest cost connection locations for load and generation can be risky for new customers in that these costs may change significantly once a first connectee is accommodated. It would be preferable to provide this information through a web based service. This service can store information about all connections and alert users to cost changes as soon as a connection offer is accepted and network capacity changes.

On points i.

Where DNOs wish to incentivise generation connections in an area to reduce reinforcement costs, these areas can be advertised on a web-costing service along with incentives being offered to generators for connections.

2.5 Benefits of additional information (Appendix 6, section 1.36)

2.5.1 Ofgem proposal

1.36. We believe the proposed package of measures will enable all customer types to get easy access to information tailored to their needs and technical competence:

- EHV customers are more likely to seek detailed and updated data and information about the distribution network, so as to be able to evaluate connection opportunities and estimate associated costs for themselves, prior to making a connection application,
- HV customers are less likely to wish to carry out their own connection studies. They are more likely to benefit from tools that indicate where connection opportunities lie and provide

indicative connection costs for different connection options. Some may simply want to deal directly with the DNO, avoiding the need for network data,

- LV customers are more likely to look for information for a specific location, and would benefit from indicative examples of DG connection arrangements that enhance their understanding of the potential costs involved.

2.5.2 Senergy Econnect Response

Some customers require a more rapid response to enquiries than some DNOs can currently provide. There is a role for third parties to provide appropriate advice or for DNO services that can provide an instant response – e.g. a web based service.

It is important to acknowledge the required level of technical competency for interpreting the connection opportunities and that such competencies are in short supply. Tools that speed up the interpretation for these customers are essential if renewable projects are to proceed in a timely fashion. This is only going to become more critical as the volume of activities in this sector increases in line with the increase in renewable generation development.

We agree that HV customers are much more likely to need a non-technical evaluation of the connection opportunities and associated costs. To that effect, Senergy Econnect is researching methods to provide such an evaluation at an initial feasibility stage. Part of this research is to identify the key subset of information about the HV (11kV) network that contributes most to the accuracy of the results. We believe this information should be made available to interested parties so that the timeliness of connection assessment for HV customers can be improved.

3 Innovation and flexibility

3.1 Ofgem Question 5

What are your views on our proposals on innovation and flexibility? How would you rate their feasibility and which option is most likely to drive the more innovative and flexible behaviour that we are seeking?

3.2 Distributed generation (sections 2.22 to 2.36)

3.2.1 Ofgem proposal

Ofgem proposal in Figure 2.3 under section 2.25

Figure 2.3: Networks areas for action as identified by the Review of Distributed Generation, DPCR5 mechanisms and other initiatives to address them

Network areas for action		DPCR5 mechanism/ other initiatives
Improving information, advice and guidance on options in DG		Mandate improved information provision by the DNOs to DG developers, in terms of both content and accessibility, including standard information on how to connect
		Industry proposal for a standard connection agreement (as a schedule to the Distribution Connection and Use of System Agreement (DCUSA))[13]
Making it easier to connect to and use the distribution network		
	Ability to connect	Initiatives to make administrative requirements for connection proportionate to generator size (G/59 and G/75)[15]
		Take account of wider DG implications in our consideration of industry code developments (such as CAP 167)[15]
	Cost of connection	DG incentive to ensure efficient cost of network reinforcement when required to connect DG
		Encourage DNOs to implement more operating expense based solutions to allow better use of network capacity and enable more DG to connect without incurring high cost network investment – by equalising the incentive to spend capital rather than operating expenses
		Encourage innovative, lower cost options for DG connection and active network management through the new innovation incentive
	Use of network	More transparent cost reflective use of system charges to ensure that DG receives benefits it provides to the system and incentivised to locate in the best locations

3.2.2 Senergy Econnect response

We make the following comments on the mechanisms/initiatives identified in Figure 2.3 of the consultation document.

<u>On the proposal for a standard connection agreement</u> (and interaction with CAP167):

Flexible networks making best use of network capacity inevitably mean an approach to network access where full capacity cannot be guaranteed. The standard connection agreement should encourage conditions-based access rather than a fixed capacity and costs should be reflective of actual access rather than declared capacity.

<u>On operating expense based solutions:</u>

It is our experience that DNOs like to have complete control over everything required to discharge their contractual obligations to generators. In offering active network management (ANM) solutions to the industry there are circumstances in which we would wish to promote an operating expense

solution. However, it is our belief that there will be few taken up if they result in a requirement to subcontract responsibilities, since this could result in the DNO being exposed without means to meet their responsibilities. Again a conditional approach within connection agreements would assist.

On the innovation incentive:

It is our view that the framework of the current price control (DPCR4) does not sufficiently incentivise DNOs towards the innovative and flexible behaviour Ofgem is seeking in order to secure future cost savings for customers. Compared to ANM, traditional 'wires-based' solutions often involve more cost in the long run, are "high carbon" and inflexible. The following sets out our case based on experience of applying GenAVC^{TM} on UK distribution networks, although the reasoning is equally applicable to other ANM solutions.

GenAVC^{TM} provides intelligent voltage control across the whole network serviced by any primary substation and can readily service many feeders and many new generation connections which are normally limited by voltage rise. However, GenAVC^{TM} is generally treated as a sole-use asset by most DNOs. This limits the quantity of generators for which it is cost-effective, which in turn severely restricts the speed of deployment.

When charged as a sole user asset there are some generators where the cost of GenAVC^{TM} is less than a conventional solution and therefore the project can proceed. Other generators are too small to afford the cost of a GenAVC^{TM} as a sole user asset, even though it is cheaper than a conventional connection solution. Other generators are offered bespoke solutions which are cheaper than GenAVC^{TM} for that generator but which will only serve that generator, and if a number of generators are connected to that network over time, the cost of these bespoke solutions will be greater than GenAVC^{TM}.

If GenAVC^{TM} were charged as a shared asset based e.g. on generation capacity it would facilitate many more connections than are currently economic and provide a flexible network to accommodate future changes in generation and demand with less need to reinforce the network.

Therefore, it is our assertion that Ofgem should indicate that ANM solutions should be considered shared use assets wherever they can provide a solution for more than one customer and judged over the long run. We are pleased to see Ofgem encouraging investment for the future and comment specifically on Ofgem's proposals on Innovation and Future Networks later in this submission (section 3.3).

On the cost reflective use of network charges:

We would greatly welcome any moves in this direction. Furthermore we would support a dynamic charging approach that

- encourages additional generation output at times of local generation shortfall and
- rewards time-shifting of load at times of local generation surplus or shortfall.

This approach would be consistent with Ofgem's desire to encourage demand side management (DSM). While we recognise that a dynamic approach creates uncertainty for generators which can cause difficulties in funding, we believe that this approach would maximise benefits for generators and DNOs. This approach would be on the path towards a Distribution System Operator (DSO) regime.

3.3 Innovation and future networks (sections 2.61 to 2.75)

3.3.1 Ofgem proposal

Ofgem summary in Figure 2.4 under section 2.65

Figure 2.4: Options and key drivers of innovation mechanism

Mechanism option	Project assessment	Project explicitly funded?	DNO reward/ penalty
1. Ex-ante	Project proposals included in the FBPQ	Yes, fully	None
2. During DPCR5	Project proposals brought forward during DPCR5	Partial up front funding	Reward based on project outcome
3. Ex-post	Project outcomes by the end of DPCR5	No	Reward or penalty

3.3.2 Senergy Econnect response

We welcome Ofgem's desire to facilitate a step change in DNOs attitudes to innovation, and particularly refer to the above paragraphs of our response in which we highlight the necessity of removing resistance as a precursor to any incentive. We note that some DNOs are more innovative than others in embracing new technology and solutions and we believe these DNOs should be rewarded for that in a way that suits them; however we would like to comment as follows on the various mechanism options of Figure 2.4:

- The behaviour of the more-innovative DNOs is observable and should encourage less-innovative DNOs.

<u>Ex-ante assessment</u>

- For the more-innovative DNOs ex-ante assessment is a low-risk encouragement to innovate more quickly. However, we question whether ex-ante assessment, in the absence of any penalties, sufficiently motivates the less-innovative DNOs to act.

<u>Ex-post assessment</u>

- Ex-post assessment (with a common fund) provides a competitive element between DNOs that is generally not available in a regulated market.
- Our primary concern with the ex-post assessment option is that it would not drive behaviour early within the price control period. An interim assessment after the first 2 years would mitigate this.
- An important element to the ex-post assessment option is a clear statement of the expected outcomes at the outset of the price control period and the extent of the potential rewards and penalties.