

Value of Distributed Energy and the Associated Issues with the Regulatory and Market Arrangements

This paper puts forward a range of issues related to the value of distributed energy for discussion at the first joint Ofgem/DTI working group on Distributed Generation.	From	Ofgem
	To	Workgroup participants
	cc	
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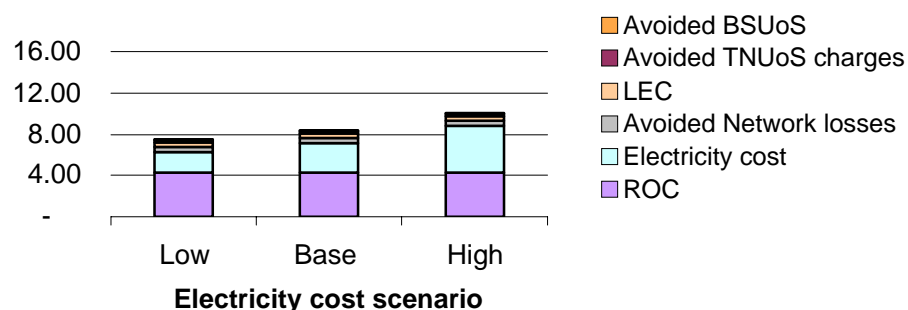
1 Introduction

1. DTI and Ofgem undertook a review of the incentives and barriers that impact on distributed generation and a Call for Evidence was published in November 2006. The consultation responses identified a number of barriers including issues around export reward and the regulatory framework. In particular, the complexities and costs facing small generators seeking to supply localised demand were identified as a specific barrier.
2. There is no one business model that is emerging as a standard “template” for the commercial arrangements for these new supply companies. In fact the variety of offerings is large with the only common theme being the local supply of electricity and sometimes heat to customers. Throughout this discussion we will refer to these new companies as “NewCos”.
3. This paper considers the two main options for sale of electricity and heat that are open to NewCos in setting up a DE scheme:
 - selling all the electricity produced to a third party supplier
 - becoming a supplier and take responsibility for the provision of electricity and heat for local customers.
4. Our focus is on developing an understanding the value of distributed energy and the issues that arise in respect of the regulatory and market arrangements. As such we do not propose to discuss solutions at the initial meetings of the working group. In particular we do not intend to review the level of the thresholds for licence requirements for supply and distribution nor do we propose to include a licence review in the first phases of the work stream.
5. We also propose to limit discussions to plant which is less than 100MW but greater than 50kW. Above 100MW, DE schemes require a generation licence (although the Secretary of State has the power to exempt certain schemes) and below 50kW, plant is categorised as micro generation and is being considered in a parallel work stream.
6. In the rest of this paper we consider:
 - the issues of selling all the electricity that is produced by a DE scheme to a third party supplier; and
 - the implications of entering the supply market in addition to constructing the DE plant.

2 Selling the electricity to a third party supplier

7. If a NewCo builds generation plant that is not for its own needs then under the current arrangements the business would tend to enter into a power purchase agreement to sell the electricity to a third party supplier. Selling all the electricity under contract provides a basis for securing finance for constructing the plant as well as avoiding the costs and risks associated with entering the supply market (discussed later in Section 3).
8. From a policy perspective all the benefits of DE schemes are realised regardless of whether the NewCo enters the supply market. It is not necessary for the NewCo to have a commercial relationship with a local hub of customers for the scheme to contribute to reduce distribution losses and, where applicable, improve efficiency of energy production.
9. We have estimated that on the basis that the energy source is renewable or a Good Quality CHP (the most frequently quoted types of plant in this context) the value of the electricity to a third party supplier is dependent on a range of factors (Chart 1). Our illustrative figures suggest that if a "green" DE schemes sells *all* its output to a third party supplier that the electricity is worth between 7.55¹ p/kWh and 10.10 p/kWh (Chart 1) which includes the value of a single ROCs (assuming it is a renewable DE scheme), LECs (again, where applicable), avoided TUoS and transmission losses.

Chart 1: Illustrative value of "green" electricity to a third party supplier



Notes: (a) LECs only applicable to renewable energy and Good Quality CHP

(b) ROCs only applicable for renewable energy

(c) In constructing the three scenarios illustrated we have used:

- High: the net back value of the electricity estimated from March 2006 retail tariffs for the high scenario
- Base: an estimate of current May 2007 wholesale prices for the Base scenario
- Low: 70% of the Base case to represent the uncertain value to third party suppliers of many types of DE.

¹ The figures that we derive in this paper are merely to set the discussion for the working group in motion and are not intended to amount to a point of reference for assessing the value of the options being considered.

10. If NewCos are unable to obtain rates for their electricity in this range then we need to understand why. Reasons might include:

- is the overhead of managing contracts with small generators sufficiently large to make it unattractive;
- are suppliers not aligning themselves with the market place at the pace at which it is developing. Suppliers are organised to purchase PPAs with large centralised generators and may not be sufficiently accessible for smaller generators to approach and negotiate with;
- does the predictability of the generation – where the electricity is sometimes the by-product of heating – make it unattractive to contract with.

Discussion questions:

- do the range of tariffs indicated in Chart 1 represent the likely value of electricity delivered by DE?
- can these tariffs be achieved in practice?
- does supplier ability to forecast when DE generation is expected to deliver need to improve and what can be done to assist in the development of better support systems?

3 Setting up as a supplier

11. In the absence of competitive rates for the sale of the electricity to third party suppliers, NewCos have the option of setting up their own supply business. This might not amount to a major additional cost for some NewCos that are also producing heat, as they are already committed to building a supply business for their heat offering. In particular the NewCo is already committed to:

- marketing and selling the proposition to local customers; and
- constructing a billing system for at least the provision of heat – we would expect that the costs of extending this to include electricity as well may well amount to an incremental, rather than a doubling of, cost.

12. However, in entering the supply market the NewCo is also going to face additional costs and risks. For a supplier that is starting from scratch the costs of supply including system set up, managing any imbalance risk, metering and billing amount to 30% of the final retail tariff (see Chart 2 later). The costs and risks, of particular note, include:

- the cost of balancing demand; and
- supply and the risk of customer switching.

13. Each is discussed in further detail.

Balancing demand and supply

14. How the NewCo balances demand and supply depends on the size of the scheme. If the scheme is sufficiently small as to not necessitate the requirement to become a licensed supplier then the NewCo will need to enter into a top up and back up contract with a

third party supplier who can use their own portfolio of generation and the balancing mechanism to ensure that demand is always met.

Discussion questions:

- are NewCos able to negotiate economic and competitive top up and back up contracts with third party suppliers?

15. If the scheme is sufficiently large as to necessitate becoming a licensed supplier then it will also become a signatory of the Balancing and Settlement Code. This requires the supplier to register its demand and generation so as to determine its exposure to the balancing mechanism.

16. In our discussions to date it has been suggested that becoming a licensed supplier and constructing the systems necessary to interact with the balancing mechanism are too onerous for small NewCos. There are two issues that we could usefully address here:

- are the transactional costs of being a signatory to the BSC disproportionately high for a small supplier. We do not have any available data to hand on the costs of such systems, although studies that have been conducted in the past looking at the complete set up costs of a small supplier indicate total system – including billing - are in the range of [£500k]. This probably amounts to [1%] of the total capital expenditure of a large DE scheme;
- do the balancing mechanism and cash-out rules contribute disproportionately either to the supplier itself bearing excessive imbalance risk or to potential buyers of Newco's output discounting their offers (to reflect the imbalance risk).

Discussion questions:

- can aggregators play a role in bridging the gap between small generators and suppliers. If so, are any measures required to further their involvement in the market?
- what are the initial system costs for small suppliers?
- what are the balancing costs for small inflexible generation?

Risk of customer switching

17. As an unlicensed supplier there is nothing to govern the length of time that customers agree to take services from the NewCos. In these situations NewCos can invest confidently knowing that they have a captive market for the duration of the investment period. Licensed suppliers, on the other hand, operate within a competitive framework that upholds the right of the customer to switch to another supplier within a reasonable time frame.

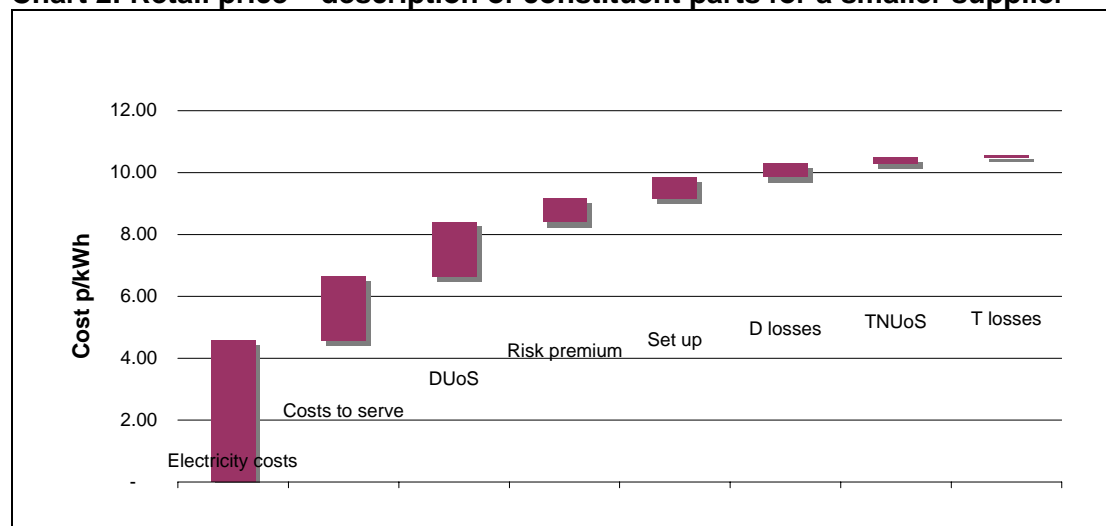
18. For NewCos that, for whatever reason, want to enter the supply business we note that switching costs for heating-supplied customers are very large. We would estimate that a stand alone heating system would cost in excess of [£2,000]. While the customer costs of switching to another electricity supplier are virtually zero and only amount to the time involved. As a consequence it is more likely that heat customers will remain loyal to the scheme on account of the lack of a regulatory framework restricting contract length and the high cost of switching.

19. One way of mitigating the risk of customers switching to another electricity supplier is to ensure that the NewCo has a competitively priced export contract with a third party supplier. If a customer switches supplier the NewCo can sell the surplus electricity to the other supplier. This raises similar issues to those discussed earlier in relation to selling the entire amount of electricity produced by the NewCo to a third party supplier. Although, we do accept that a small proportion of the electricity produced by the plant would be less attractive than the purchase of the entire output – if only on account of the transaction costs being the same regardless of the volumes.

Value of exported electricity

20. Responses from the Call for Evidence indicated that the difference between the export and import prices was having a significant impact on the commercial viability of Distributed Energy schemes that also want to supply the electricity.
21. The retail tariff encompasses a range of costs including wholesale electricity, energy trading, network, customer services and marketing costs. The average direct debit residential tariff in March 2006 was 10.58 p/kWh of which the average wholesale energy component was worth approximately 4.58 p/kWh (Chart 2).
22. In addition to the basic value of the wholesale electricity, DE schemes also attract a range of other benefits including avoided TUoS charges, transmission losses and, if a renewable source, ROCs and LECs (as described in Chart 1).
23. For NewCos that use electricity produced on-site for own-use the value of the electricity is the price of the import tariff. The more they consume on site the less they have to import. However, if the NewCos enters into a supply agreement with another customer then whether this is done with a supply licence or not they are exposed to additional supply costs that reduce the value of this electricity. These costs and the associated risks of supply have already been discussed earlier but amount to around 30% of the retail tariff. These costs together with any network costs represent the difference between the export value and the import tariff of electricity.

Chart 2: Retail price – description of constituent parts for a smaller supplier



Notes:

- (a) Small supplier defined as one with approximately 1,000 customers
- (b) Electricity costs estimated net back from incumbent retail prices - Source: Domestic Retail Market Report, Ofgem, July 06
- (c) Risk premium assumed to be approximately 15% of wholesale electricity costs
- (d) Renewables Obligation cost on supplier amounts to £7 per customer, Ofgem, 2007
- (e) There is no EEC obligation on Suppliers with less than [15,000] customers
- (f) Value of ROC 2005/06, Ofgem, Feb 2007

Source: Smaller Suppliers in the UK Domestic Electricity Market: Experience, Concerns and Policy Recommendations, Stephen Littlechild, 29 June 2005