Methodology for LDZ System Entry Commodity Charge – Explanatory Note

Determination of Unit Rate for Opex Costs

This unit rate will be determined from the forecast operating costs relating to the entry facilities operated by the DN and any "deep" network assets directly relating to the entry flows and from the forecast entry gas flow for the same period. No reconciliation to actual operating costs and gas flows will be done after any period.

In order to reduce the administration costs of re-estimating these values each year, it is proposed that, after initial determination, the unit rate for future years would normally be determined by applying an RPI inflation factor based rather than through redetermination from the underlying factors. However, the methodology allows for redetermination from the underlying factors for any future period so as to handle situations where the forecast costs or flows would be expected to differ substantially from those last utilised due perhaps to changes to entry facility equipment or operating processes or to network utilisation or configuration changes impacting on within-network compression usage.

Determination of Unit Rate for ECN Credit

The rationale for this credit is that LDZ System entry flows, if dependable, provide an alternative means to NTS Exit capacity for the DN to ensure the capability to flow gas into the DN network at peak times. In practice it will be impractical to link particular LDZ System entry points to NTS Exit capacity booking levels at particular offtakes and so it is proposed that the credit is valued by reference to the average DN ECN charge for a period, since the ECN charge will be the DNs' means of passing through the NTS Exit capacity costs. The degree to which LDZ System entry flows can be depended upon for system planning purposes, so as to provide an alternative to booking NTS Exit capacity, is factored into the calculation through a Dependability Factor.

It is proposed that the unit rate is based on the average ECN charge for the whole DN multiplied by a Dependability Factor and then converted into a commodity equivalent charge

i.e. $\text{Unit Rate}_{\text{capacity}} = \text{ECN}_{(\text{p/pdkWh/d})} * D$, where D is Dependability Factor

To convert to a commodity equivalent charge, multiply by daily capacity for entry point (SOQ) and 365 (days), divide by Annual Quantity (throughput) for supply point

i.e. $\text{Unit Rate}_{\text{commodity}} = \text{Unit Rate}_{\text{capacity}} * SOQ * 365 / AQ$

But Load Factor, $LF = AQ / (365*SOQ)$

So $\text{Unit Rate}_{\text{commodity}} = \text{Unit Rate}_{\text{capacity}} / LF = \text{ECN}_{(\text{p/pdkWh/d})} * D / LF$

Thus if Dependability Factor, D, is set equal to Load factor, LF, then

$\text{Unit Rate}_{\text{commodity}} = \text{ECN}_{(\text{p/pdkWh/d})}$

For example, if the average ECN rate for a DN is 0.0150 p/pdkWh/d then the Unit Rate for ECN Credit for any LDZ System Entry Point in the DN would be 0.0150 p/kWh for the same period.

Although basing the Dependability Factor on the load factor may seem simplistic, an entry flow with a higher load factor, producing closer to its peak supply on each day, may, in the absence of other information, be considered to be more dependable for planning purposes than a supply point with a more variable flow i.e. with a lower load factor.

Another advantage of this credit determination basis is that it avoids the need to obtain an estimate of the load factor characteristic of each LDZ System Entry Point.

It is worth noting that the use of the load factor for an entry point as an estimate of its dependability, and the preference for commodity-based rather than capacity-based rebates, is already established within the methodology for determining DNO credits for embedded electricity generation. Appendix A contains an extract from an Ofgem consultation on the DNO charging methodology which references these issues for electricity generation.

Determination of Unit Rate for LDZ System Credit

The rationale for this credit is that the Standard LDZ System capacity and commodity charges are based on analysis of the utilisation of the different LDZ System tiers entry flows by Supply Points of different sizes which reflects gas entering the DN system from the NTS. Gas from LDZ System entry points may enter directly into a lower pressure tier than the Local Transmission System and so may utilise fewer tiers of the system than gas entering from the NTS typically would. Since the exit-based LDZ System charges assume transportation of NTS-sourced gas it is appropriate to provide a utilisation credit for LDZ System entry flows so that the net (lower) transportation charge in respect of gas transported from a LDZ System entry point to a DN Supply Point reflects the different typical system utilisation.

The latest LDZ System charges (post-April 2012) are based on the methodology consulted on within DNPC08 and reflect analysis of LDZ System tier costs and usage for each DN individually. The derived charges are based on tier costs for each of the main tiers (and sub-tiers for the Low Pressure tier) and so it is proposed that these main tier costs are used as the credits for LDZ System entry points, appropriately scaled.

Since it is proposed that the unit credits are commodity based it is appropriate to base them on the commodity unit costs of each tier in the DNPC08 analysis scaled to the LDZ System charges for the appropriate period. In addition, the unit commodity costs from the DNPC08 analysis were based on the LDZ System commodity charges recovering 5% of the LDZ System revenue and so since the credits are based 100% on commodity it is necessary to scale the DNPC08 unit commodity costs by 20 times to give 100% revenue equivalent levels.

The DNPC08 analysis showed that the typical use of the different pressure tiers varied with the size of the Supply Point. However, most of the variation is in the use of the Low Pressure tier and the use of the MP, IP and LTS tiers is fairly stable across most of the Supply Point sizes. It is appropriate therefore to use the typical costs for these tiers as the basis for the credits.

Using West Midlands DN as an example, the tier costs in the DNPC08 analysis which underlie the domestic commodity rate are as shown below, scaled to the level of the April 2012 charges, and multiplied by a factor of 20.

Unit Cost of each System Tier		
	At 5% level	**At 100% level**
	p/kWh	p/kWh
LTS	0.0026	0.0520
IP	0.0006	0.0114
MP	0.0042	0.0840
LP	0.0200	0.4005
Total	**0.0274**	**0.5480**

The Unit Rate for LDZ System Credit would be calculated as:

Highest Utilisation Tier	**Unit Rate Credit**
LTS	Zero
IP	LTS Utilisation Rate
MP	IP plus LTS Utilisation Rates
LP	MP plus IP plus LTS Utilisation Rates

For the West Midlands DN example, the credits would therefore be as shown below.

LDZ System Credit	
LDZ System Entry Point Highest Utilisation Tier	p/kWh
LTS	Zero
IP	0.0520
MP	0.0634
LP	0.1475

where the Highest Utilisation Tier is defined as the higher (in terms of pressure) of:

- the tier at which gas enter into the LDZ system from the LDZ System Entry Point;
- the tier which gas from the LDZ System Entry Point is, via within-network compression, moved to (this is not applicable for gas which is not subject to within-network compression).

This example illustrates that, since the costs attributed to the Low Pressure tier typically make up at least 70% of the LDZ System tier costs, the maximum LDZ System utilisation credit would be no more than 30% of the equivalent LDZ System commodity charge rate if scaled to recover 100% of the LDZ System revenue.

Determination of Overall LDZ System Commodity Charge

The LDZ System Commodity Charge would be calculated as:

Unit Rate for Opex Costs + Unit Rate for ECN Credit + Unit Rate for LDZ System Credit

The Opex Costs unit rate will always be zero or a positive amount whereas the other unit rates, being credits, would always be negative or zero, and so the overall commodity charge could be either positive (a charge) or negative (a credit).

Appendix A: Extract from Ofgem Consultation 114/09, September 2009

Electricity distribution structure of charges project: DNOs' proposals for a common methodology at lower voltages

Generator charging

2.28. In our decision documents we stated that distributed generation (DG) should receive credits where they provide benefit to the network. Such benefit will generally be incurred in a demand dominated network, where network incremental costs are driven by demand, and DG export offsets some of the demand, thereby deferring reinforcement investment.

2.29. Under the assumption that the network is demand dominated we specified that a credit should be given to DGs in respect of every network level above their level of connection in recognition of the benefit DGs provide to the network. We provided the following base formula for the calculation of pre-scaled charges for generation:

DG network level yardstick (k/kWh) = -F_Factor * DRM_Yardstick(£/kWh)

2.30. The formula above applies to each network level above the level of connection of the generator. The formula implies that generators receive a credit equal to the network level yardstick scaled down by a technology specific F factor[9] in recognition that not all of it can be relied on to commence output during system peak. To work out the total credit in respect of each network level, this negative charge can be multiplied by the generator's installed capacity.

2.31. Early in the development of the CDCM, the DNOs put forward arguments against the reliance on F factors and installed capacity. Their arguments, as summarised in paragraph 140 of the CDCM report, are:

- (a) Capacity-based payments would require DNOs to collect and validate information about installed generation capacities. (They say that using export capacities was not a viable alternative as it would lead to a perverse treatment of reactive power and potential perverse incentives to book unnecessary capacity).
- (b) Capacity-based payments would be open to fraud or gaming, e.g. from generators stating or installing capacity in excess of what they actually use (and therefore in excess of what actually provides benefits to the network).
- (c) Capacity-based payments would reward rarely used generators (e.g. stand-by generators) as much as regularly operating generators, even though the latter provide more benefits to the network.
- (d) To apply capacity-based payments, it is necessary to allocate generators into categories and to allot estimated F factors to each category, opening the door to disputes and perverse boundary effects. Responses to the generation consultation highlighted the large approximations that would be involved in using generic estimated F factors.

2.32. The DNOs presented an alternative method where credit to generators was based on units distributed (kWh) rather than on installed capacity (kW). According to the alternative approach, generators charges at each network level are determined according to:

$$\text{DG charge (£)} = -\text{DRM\_Yardstick (£/kWh)} * \left[\text{F\_Factor} * \frac{\text{Annual\_units\_distributed (kWh)}}{\text{Assumed\_load\_factor} * 24 * 365}\right]$$

9 The F factor represents the probability of a generator of a certain technology commencing output. Their values, as set out in Engineering Recommendation P2/6, have been determined for network system planning and security of supply purposes.

2.33. Intuitively, as both the F factor and load factor measure availability their ratio should be very close to unity. In order to simplify the calculation, and arguably without loss of cost reflectivity, the DNOs made the assumption that, for a given technology, the F factor and load factor are equal. With this assumption, the equation above reduces to the following:

$$\text{DG charge (£)} = -\text{DRM\_Yardstick (£/kWh)} * \left[\frac{\text{Annual\_units\_distributed (kWh)}}{24*365} \right]$$

2.34. We note that this equation calculates DG credit in respect of kWh export. The final generator charge may include a small, positive, fixed component in respect of operation and maintenance of dedicated assets. See the section on service models in this document for further discussion on this issue.

2.35. We note that our October 2008 decision document sets out that generator charges be applied above the voltage of connection and that the CDCM refers to the voltage of supply.

Our minded to decision

2.36. We believe that the high-level method described above provides the right incentive (pre scaling) for distributed generation both to connect to the network and to commence output. In addition, we believe that the working assumption that the F factor and load factor are equal is reasonable. We note that this method is a deviation from the method we prescribed in our October 2008 decision document but we consider this method to be appropriate and are minded to accept this high-level element of the methodology without condition.