

**LDZ Shrinkage Quantity  
Initial Proposals  
Formula Year 2010/11**

**National Grid  
1 January 2010**

## National Grid LDZ Shrinkage Initial Proposals - Formula Year 2010/11

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## **National Grid LDZ Shrinkage Proposal for Formula Year 2010/11**

### **1. Purpose of Proposal**

The purpose of this paper is to present our proposals in respect of National Grid LDZ Shrinkage for the Formula Year 2010/11, as required under Section N of the Uniform Network Code.

Under Section N of the Uniform Network Code, National Grid has an obligation to estimate the LDZ Shrinkage Quantity values for the coming Formula Year and to present these to Users for consultation.

In April 2009, the Distribution Network Owners proposed a change to the leakage model that facilitated the recognition of the leakage reduction associated with the replacement of gas services. This change was progressed through the process outlined in Special Condition E9 of the Gas Transporter Licences, which required consultation with the industry and review by an 'Independent Expert'. In June 2009, Ofgem approved this change to the model. The revised model was used for the 2008/09 leakage assessment, which was used for the Shrinkage assessment for the period 1 October 2008 to 31 March 2009 issued in July 2009. These proposals utilise the revised model.

Following representations from Users, a further paper will be issued, by 1 March 2009, in which National Grid will set out its final estimate of its LDZ Shrinkage Quantity values.

For the purposes of this document, 'LDZ' refers to LDZs, as defined by Uniform Network Code, owned by National Grid.

## 2. Summary of Proposal

This proposal has been produced in line with the recent changes to the Shrinkage Proposal process within UNC<sup>1</sup>. The major difference between the new regime and the old is that Shrinkage is to be procured as a fixed daily LDZ Shrinkage Quantity throughout the Formula Year rather than a fixed proportion of daily throughput (formerly, the LDZ Shrinkage Factor) applied over the Gas Year.

The LDZ Shrinkage Quantity values, which are set out within Table 1 below, reflect the losses associated with Unaccounted for Gas (leakage & theft of gas) and Own Use Gas (gas used in the operation of the system). Details of how these Quantity values have been determined are included in this paper. The structure of the paper follows the format of a Network Code Modification report.

LDZ	Existing Shrinkage Quantities 2009/10 Formula Year (GWh)				Proposed Shrinkage Quantities 2010/11 Formula Year (GWh)			
	Leakage	OUG	Theft	Total	Leakage	OUG	Theft	Total
<b>Eastern</b>	230	5	10	245	230	5	9	244
<b>East Midlands</b>	336	8	15	359	312	7	13	333
<b>North Thames</b>	345	7	13	364	338	6	12	356
<b>North West</b>	432	9	17	458	418	8	15	441
<b>West Midlands</b>	381	6	11	399	345	6	10	361
<b>National Grid</b>	<b>1,724</b>	<b>36</b>	<b>65</b>	<b>1,824</b>	<b>1,642</b>	<b>33</b>	<b>59</b>	<b>1,734</b>

Table 1. Proposed LDZ Shrinkage Quantity values for the 2010/11 Formula Year

The calculations that were used to derive the Shrinkage Quantity values and a summary of the underlying information are set out in this proposal.

In addition to proposed investment in pressure management and forecast mains replacement for 2010/11, the reduction in leakage also reflects the impact of improved pressure management, improved MEG saturations and additional to planned mains replacement within the 2009/10 formula year.

The reduction in Own Use Gas and Theft of Gas is due to lower forecast demand levels.

The Daily Shrinkage Quantity values, in Table 2 below, will be used as the basis for National Grid's LDZ Shrinkage gas procurement during the Formula Year in question.

LDZ	Daily Shrinkage Quantity (kWh)
<b>Eastern</b>	668,963
<b>East Midlands</b>	912,152
<b>North Thames</b>	974,307
<b>North West</b>	1,207,682
<b>West Midlands</b>	988,253
<b>National Grid</b>	<b>4,751,358</b>

Table 2. Proposed LDZ Daily Shrinkage Quantity Values for 2010/11 Formula Year

## 3. Component Analysis

This section of the document presents an analysis of the components of LDZ Shrinkage that make up the estimates for the Formula Year 2010/11 proposal.

### 3.1 Leakage

Leakage represents the largest component of the LDZ Shrinkage Quantity

<sup>1</sup> UNC Modification Proposals 0203V and 0225

For the purpose of analysis, leakage may be conveniently split into three categories:

- Distribution Mains (including service pipes),
- Above Ground Installations (AGIs) and
- Other losses

Distribution mains and services leakage is a feature of normal system operation.

AGI leakage includes the routine venting of control equipment.

Other losses include gas lost as a result of interference damage and broken mains. These losses are caused by specific events and are not continuous.

### 3.1.1 Distribution Mains (and Services) Leakage

The leakage of gas from the Distribution Mains system, which includes service pipe leakage, is calculated by combining the results of the 2002/03 National Leakage Test programme with the following network<sup>2</sup> specific information:

- Pipe asset data<sup>3</sup>
- Annual average system pressure in each network
- Measured concentration of Monoethylene Glycol (MEG) joint treatment chemical in the gas
- Annual metallic service replacement

Leakage is calculated by multiplying the annual average mains pressure in each network by the Main and Service Pipe Leakage Factors determined by the 2002/03 National Leakage Test programme and the relative lengths of mains / numbers of services in each network. Where applicable, i.e. cast iron mains only, the Pipe Leakage Factors are adjusted to take into account the measured concentration of MEG.

Information relating to the National Leakage Test programme, the application of the results to calculate leakage and the external validation of the results has already been shared with Users and Ofgem; consequently, it is not proposed to include additional details in this paper.

A detailed comparison of changes in low-pressure leakage, which accounts for approximately 80% of leakage, from last year's proposal is included in Appendix 1.

Table 3 below shows the Low Pressure leakage on an LDZ basis:

LDZ	Low Pressure Leakage	
	Tonnes <sup>4</sup>	GWh
Eastern	11,901	179
East Midlands	15,849	238
North Thames	18,543	278
North West	24,109	362
West Midlands	19,233	288
<b>National Grid</b>	<b>89,635</b>	<b>1,345</b>

Table 3. Estimated LDZ Low Pressure Leakage for 2010/11 Formula Year

<sup>2</sup> Network in this context relates to physically interconnected pipe systems, not National Grid's regionally based administrative structure.

<sup>3</sup> Actual asset data as at 31 March 2009 adjusted for completed and planned iron replacement to 31 March 2011.

<sup>4</sup> Leakage figures in Tonnes are provided for information; it is not used in respect of Shrinkage Quantity calculations. Conversion to Tonnes is based on a gas density of 0.73kg/m<sup>3</sup>.

Table 4 below shows the estimated Medium Pressure leakage on an LDZ basis:

LDZ	Medium Pressure Leakage	
	Tonnes	GWh
<b>Eastern</b>	1,030	15
<b>East Midlands</b>	2,871	43
<b>North Thames</b>	1,834	28
<b>North West</b>	1,319	20
<b>West Midlands</b>	1,657	25
<b>National Grid</b>	<b>8,711</b>	<b>131</b>

Table 4. Estimated LDZ Medium Pressure Leakage for 2010/11 Formula Year

### 3.1.2 AGI Leakage

The figures for leakage from Above Ground Installations have been taken from the findings of the 2003 Above Ground Installation Leakage Test programme.

Information relating to the programme has already been shared with Users and Ofgem at the Shrinkage Forums held in 2003; consequently, it is not proposed to include significant detail in this paper.

Table 5 below shows the estimated AGI leakage on an LDZ basis:

LDZ	AGI Emissions <sup>5</sup>	
	Tonnes	GWh
<b>Eastern</b>	2,762	42
<b>East Midlands</b>	2,660	40
<b>North Thames</b>	2,446	37
<b>North West</b>	3,320	50
<b>West Midlands</b>	2,778	42
<b>National Grid</b>	<b>13,966</b>	<b>210</b>

Table 5. Estimated AGI Emissions for 2010/11 Formula Year

### 3.1.3 Other Losses

Gas may be lost from LDZ equipment as a result of specific events, namely broken mains and interference damage to plant, in addition to ongoing leakage. These losses are known collectively as 'other losses'.

Statistics in respect of the number of routine broken mains and damages are used in conjunction with calculations of the amount of gas lost through each type of incident to derive the total amount of gas lost from these events. (For the purpose of this paper, the number of events in 2008 has been used for the analysis together with emergency personnel response times.)

In addition to the routine events in 2008, there were 69 gas release events where the total gas released was greater than 500kg. For these, the specific volume released, where calculated, was used. In total for National Grid, the energy loss resulting from these events was 5 GWh. Table 6 below shows the amount of gas lost because of other losses on a LDZ basis, which is proposed as the estimate for 2010/11:

<sup>5</sup> Includes leakage and routine equipment venting

LDZ	Interference Damage	
	Tonnes	GWh
<b>Eastern</b>	42	1
<b>East Midlands</b>	79	1
<b>North Thames</b>	55	1
<b>North West</b>	92	1
<b>West Midlands</b>	58	1
<b>National Grid</b>	<b>326</b>	<b>5</b>

Table 6. 2008/09 (and estimated 2010/11) Interference Damage

### 3.1.4 Leakage Reduction Initiatives

National Grid recognises that climate change is possibly one of the greatest challenges facing society in the 21<sup>st</sup> century. Natural Gas is composed primarily of Methane, which as a Greenhouse Gas is twenty-three times worse than carbon dioxide. National Grid has a climate change strategy that targets an 80% reduction in greenhouse gas emissions by 2050.

There are a number of initiatives being employed across the Company to achieve this aim, one of which directly impacts the leakage from low pressure gas distribution systems. Leakage from low pressure gas distribution systems contributes approximately 80% of all gas distribution leakage and the major controllable influence on this is the pressure at which the systems operate. Replacing old metallic pipe with plastic pipe will help reduce emissions; however, in order to achieve this in the most economic way, mains insertion techniques are used where possible and the impact of this is to drive operating pressures upwards. During 2008, National Grid embarked upon a programme of installing pressure profiling equipment, which is expected to result in lower average system operating pressures. In addition to installing additional pressure management equipment, National Grid has also upgraded its pressure control management system, which will enable improved monitoring, recording and reporting of system pressures.

Historically, there has been minimal change in Average System Pressures (ASP) from year-to-year. However, with the installation of profiling equipment, it is anticipated that ASPs will reduce significantly. Therefore, National Grid propose to include an estimate of leakage reduction associated with pressure management initiatives within the Shrinkage Quantity Proposals, so as to try to minimise the amount of post period adjustment associated with the Shrinkage Assessment and Adjustment process. UNC Modification Proposal 0203V changed the Shrinkage Assessment process such that all elements of the Shrinkage calculation are corrected for, hence, any estimated value will be replaced with an actual post period assessment and there will be an appropriate RbD reconciliation.

Table 7 below shows the anticipated impact on 2010/11 leakage of the Pressure Profiler Installation programme and software upgrade:

LDZ	Leakage Reduction	
	Tonnes per annum	GWh per annum
<b>Eastern</b>	437	7
<b>East Midlands</b>	651	10
<b>North Thames</b>	389	6
<b>North West</b>	1,040	16
<b>West Midlands</b>	683	10
<b>National Grid</b>	<b>3,200</b>	<b>48</b>

Table 7. Estimated 2010/11 Leakage Reduction Initiative Benefit

### 3.1.5 Total Leakage

Table 8 below shows the total amount of estimated leakage for Formula Year 2010/11 on an LDZ basis with the leakage expressed in Tonnes, GWh and as a flat daily Quantity in kWh.

LDZ	Leakage		
	Tonnes per annum	GWh per annum	kWh per day
Eastern	15,298	230	630,079
East Midlands	20,808	312	854,889
North Thames	22,489	338	924,666
North West	27,799	418	1,144,141
West Midlands	23,045	345	945,106
<b>National Grid</b>	<b>109,438</b>	<b>1,642</b>	<b>4,498,882</b>

Table 8. Estimated 2010/11 Formula Year LDZ Leakage Summary

### 3.2 Own Use Gas

Own Use Gas is treated as a consolidated Quantity, calculated as a factor of 17-year seasonal normal annual LDZ consumption, to be procured on a flat daily basis.

In line with this methodology, National Grid proposes to apply a fixed LDZ Specific daily Quantity for OUG equivalent to 0.011% of 17-year seasonal normal LDZ consumption. This factor represents the estimated National average (to three decimal places as a percentage) that was determined by Advantica in 2002 and which has been applied since the 2005/06 Gas Year.

The estimated 2010/11 Own Use Gas Quantity values are shown in Table 9 below.

LDZ	17 Year Seasonal Normal LDZ Consumption	OUG GWh per annum	OUG kWh per day
Eastern	45,783	5	13,798
East Midlands	67,423	7	20,319
North Thames	58,448	6	17,615
North West	74,814	8	22,547
West Midlands	50,803	6	15,310
<b>National Grid</b>	<b>297,270</b>	<b>33</b>	<b>89,588</b>

Table 9. Estimated 2010/11 LDZ OUG Quantity Values

### 3.3 Theft of Gas

UNC Section N 1.3.2 states that LDZ Shrinkage shall include, and National Grid is therefore responsible for, gas illegally taken upstream of the customer control valve and downstream where there is no shipper contract with the end-user.

Historically, unidentified theft has been assumed to be 0.3% of LDZ Consumption.

As with Own Use Gas, Theft of Gas is treated as a consolidated Quantity calculated as a factor of 17-year seasonal normal annual LDZ consumption to be procured on a flat daily basis.

The responsibility for Theft of Gas is split between Gas Transporters and Shippers.

The statistics for confirmed Theft of Gas for 2008/09 are detailed in Table 10 below.

	2008/09	
	Total	Transporter Responsible
<b>Reported incidents of Theft</b>	3,842	499

Table 10. 2008/09 Theft of Gas Statistics

The statistics for 2008/09 indicate that, of the cases of confirmed theft, 13% was identified as being the responsibility of the Transporter.

Prior to 2005/06 Gas Year, Transporter responsible theft had been considered to be 10% of overall theft; however, in recent years, Transporter Responsible theft has been estimated, consistently, at 5% or below of total theft<sup>6</sup>. This led to the negotiation and, ultimately, adoption of a lower national ToG factor of 0.02% of throughput, which is equivalent to 6.67% of overall theft. Clearly, the Transporter / Shipper responsible split of actual theft will vary year-on-year and recent history indicates much lower levels of Transporter theft than the 2008/09 statistics. Therefore, we do not propose at this time to recommend a change to last year's agreement; consequently, we believe that it is appropriate for National Grid to assume responsibility for Theft of Gas equal to 0.02% of LDZ Consumption. Table 11 below shows the estimated 2010/11 Theft of Gas Quantity Values:

LDZ	17 Year Seasonal Normal LDZ Consumption	ToG GWh per annum	ToG kWh per day
<b>Eastern</b>	45,783	9	25,087
<b>East Midlands</b>	67,423	13	36,944
<b>North Thames</b>	58,448	12	32,026
<b>North West</b>	74,814	15	40,994
<b>West Midlands</b>	50,803	10	27,837
<b>National Grid</b>	<b>297,270</b>	<b>59</b>	<b>162,888</b>

Table 11. Estimated 2010/11 LDZ Theft of Gas Quantity Values

### 3.4 LDZ Shrinkage Quantity Summary

Table 12 below shows the proposed LDZ Shrinkage Quantity Values for the Formula Year 2010/11 in GWh per annum:

LDZ	Leakage (GWh)	OUG (GWh)	Theft (GWh)	Total (GWh)
<b>Eastern</b>	230	5	9	244
<b>East Midlands</b>	312	7	13	333
<b>North Thames</b>	338	6	12	356
<b>North West</b>	418	8	15	441
<b>West Midlands</b>	345	6	10	361
<b>National Grid</b>	<b>1,642</b>	<b>33</b>	<b>59</b>	<b>1,734</b>

Table 12. Estimated 2010/11 LDZ Shrinkage Quantity Values

<sup>6</sup> Transporter Responsible Theft: 2002 – 4.4%, 2003 – 1.2%, 2004 – 4.0%, 2005 – 3.1%, 2006 – 5.4%, 2007 – 10.1%

Table 13 below shows the estimated Daily Shrinkage Quantity values applicable for the 2010/11 Formula Year in kWh per day:

<b>LDZ</b>	<b>Leakage (KWh)</b>	<b>OUG (KWh)</b>	<b>Theft (KWh)</b>	<b>Total (KWh)</b>
<b>Eastern</b>	630,079	13,798	25,087	668,963
<b>East Midlands</b>	854,889	20,319	36,944	912,152
<b>North Thames</b>	924,666	17,615	32,026	974,307
<b>North West</b>	1,144,141	22,547	40,994	1,207,682
<b>West Midlands</b>	945,106	15,310	27,837	988,253
<b>National Grid</b>	<b>4,498,882</b>	<b>89,588</b>	<b>162,888</b>	<b>4,751,358</b>

Table 13. Estimated 2010/11 LDZ Daily Shrinkage Quantity Values

#### **4. Detailed Analysis**

##### **4.1 Leakage**

In 2003, Advantica – on behalf of Transco – completed an extensive programme of Leakage Tests. The leakage tests were carried out on above ground installations and distribution mains and services. The results of the leakage tests and details of their verification have been shared with Users through the Shrinkage Forum and have formed the basis of our Shrinkage Proposals since 2003.

We believe that these test programmes still provide a firm basis for assessing the leakage from both the distribution mains and AGIs; consequently, National Grid has utilised the information as the basis for these proposals.

The results of the leakage testing programmes have been used in conjunction with our mains and other plant records, measurements of MEG concentration and system pressures to derive total leakage by LDZ.

As part of National Grid's endeavour to reduce greenhouse gas emissions, real-time estimation of leakage management performance, ASP and MEG, has been introduced; this keeps the focus on the emissions issue and enables any potential problems to be identified and addressed quickly. The output of this monitoring of ASP and MEG performance has been used as the basis for these proposals.

There have been significant changes in overall average system pressure the net effect of which is a decrease of 0.36mbar.

There is an anticipated minimal increase in MEG concentration of 0.8% in absolute levels.

In addition, there has been, and will continue to be, significant replacement of iron mains, in line with National Grid's mains replacement policy. These proposals assume an estimated amount of mains replacement applicable for the 2010/11 leakage assessment; equating to approximately 4000km of iron main from April 2009, i.e. approximately 2000km per annum.

The net effect of these significant elements has been to reduce the amount of leakage.

#### **5. Extent to which the Proposal would better facilitate the relevant objectives**

This proposal provides an accurate estimate of LDZ Shrinkage Quantity values for the Formula Year 2010/11. As a result, the gas usage and loss in transportation within the LDZs will be reflective of actual conditions. This in turn facilitates the achievement of efficient and economic operation of the system through effective targeting of costs.

It will also lead to better targeting of costs to Users through the RbD process and this is consistent with securing effective competition.

**6. The implications for National Grid of implementing the Proposal**

- a) **Implications for the operation of the System:**  
We are not aware of any such implications that would result from implementing this proposal.
- b) **Development and capital cost and operating cost implications:**  
The proposed LDZ Shrinkage Quantity values lead to a fair allocation of operating costs between LDZ systems.
- c) **Extent to which it is appropriate for National Grid to recover the costs, and proposal for the most appropriate way for National Grid to recover the costs:**  
It is appropriate for each LDZ to incur a share of the overall Shrinkage Energy dependent upon the actual shrinkage in that LDZ.
- d) **Analysis of the consequences (if any) this proposal would have on price regulation**  
None identified.

**7. The implications of implementing the Proposal for Users**

This proposal improves the equability and accuracy of cost targeting across all Users.

**8. Analysis of any advantages or disadvantages of implementation of the Proposal**

- **Advantages:** Better reflective of the actual system usage and losses with improved cost targeting.
- **Disadvantages:** National Grid is not aware of any disadvantages.

**9. Summary of the representations (to the extent that the import of those representations are not reflected elsewhere in the Proposal)**

This paper outlines our Initial Proposals. We appreciate hearing the views of Ofgem and Users; these views will help inform our Final Proposals, which are due to be published on 1 March 2009.

Users wishing to discuss any matter can do so in private or at a Shrinkage Forum should the Industry require one to be convened.

It would be appreciated if Users could let us have any feedback that they would like to share with us before 1 February 2009<sup>7</sup> to enable us to better respond to any concerns.

**10. Programme of works required as a consequence of implementing the Proposal**

The only required modification is the input of LDZ Daily Shrinkage Quantity values into GEMINI.

**11. Proposed implementation timetable (inc timetable for any necessary information system changes)**

Following publication of our Final Proposals, Users will have until 15 March 2009 to request that Ofgem issue a Standard Special Condition A11 (18) disapproval of this proposal; this provision is in the Uniform Network Code Section N 3.1.8.

If no disapproval notice is issued beforehand, it will be our intention to implement revised LDZ Daily Shrinkage Quantity values from 06:00 hrs on 1 April 2009.

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<sup>7</sup> Due to the pressure of time, it will be difficult to respond to any points that might be raised during February because the Uniform Network Code requires National Grid to publish its proposals on 1 March.

**12. Recommendation concerning the implementation of the Proposal**

We recommend the proposed LDZ Daily Shrinkage Quantity values be implemented with effect from 06:00 hrs on 1 April 2009.

**13. National Grid's Proposal**

This report contains our Initial Proposals for the LDZ Daily Shrinkage Quantity values for the Formula Year 2010/11.

## **Appendix 1: LP Pipe and Service Leakage Analysis 2009 to 2010 proposals by LDZ**

This section of the document provides a comparison of the assessed levels of LP pipe and service leakage by LDZ. Users have requested more detail with regard to leakage assessment to be presented within National Grid LDZ Shrinkage Factor proposals.

Details of leakage in energy quantity, annual Average System Pressures (ASP) and Monoethylene Glycol (MEG) levels are presented for 2010/11 with 2009/10 for comparison purposes. The levels quoted are only those attributable to low pressure mains and service leakage; MEG Levels relate to the length weighted average saturation in low pressure networks where MEG is used.

National Grid has introduced real-time estimation of leakage management performance, ASP and MEG, in its endeavour to reduce greenhouse gas emissions; this keeps the focus on the emissions issue and enables the identification and resolution of any potential. These proposals utilise the output of this monitoring of ASP and MEG performance.

We have supplied specific information relating to the average pressure experienced by networks that contain metallic pipes, which excludes the all-PE networks that often operate at higher pressures but have very low leakage because of their superior performance. This should enable Users to better compare the effective operating pressures of the different LDZs.

### **A1.1 Eastern LDZ**

	<b>2009 Proposal</b>	<b>2010 Proposal</b>
<b>Leakage (GWh)</b>	182	179
<b>Annual Average System Pressure (mbar)</b>	32.3	32.1
<b>ASP (All-PE systems excluded) (mbar)</b>	31.4	31.1
<b>MEG Saturation Level</b>	0%	0%

**Table A1.1 Eastern LDZ**

There is an anticipated decrease of 0.3mbar in overall ASP for Eastern LDZ and more significantly, a decrease in ASP of 0.3mbar for mixed material networks.

This LDZ does not treat lead yarn jointed cast iron mains with MEG.

It should be noted that mains replacement has also affected leakage by substituting new, better performing PE pipes for older metallic ones.

In addition to the above, there is an anticipated benefit of 7GWh associated with planned Pressure Profiling Equipment installation and the pressure monitoring system upgrade.

### A1.2 East Midlands LDZ

	2009 Proposal	2010 Proposal
Leakage (GWh)	264	238
Annual Average System Pressure (mbar)	33.7	33.2
ASP (All-PE systems excluded) (mbar)	31.8	31.2
MEG Saturation Level	24%	23%

**Table A1.2 East Midlands LDZ**

There is an anticipated decrease of 0.5mbar in overall ASP for East Midlands LDZ and, more significantly, a 0.6mbar decrease in ASP for mixed material systems. There is a slight anticipated decrease of 1% in MEG Saturation levels.

In addition, there is an anticipated benefit of 9GWh associated with planned Pressure Profiling Equipment installation and the pressure monitoring system upgrade.

### A1.3 North Thames LDZ

	2009 Proposal	2010 Proposal
Leakage (GWh)	278	278
Annual Average System Pressure (mbar)	25.5	25.6
ASP (All-PE systems excluded) (mbar)	25.5	25.6
MEG Saturation Level	19%	11%

**Table A1.3 North Thames LDZ**

There is an anticipated increase of 0.1mbar in ASP for North Thames LDZ and a decrease of 8% in MEG Saturation levels, which is anticipated to offset the benefits of mains replacement.

In addition, there is an anticipated benefit of 6GWh associated with the pressure monitoring system upgrade.

### A1.4 North West LDZ

	2009 Proposal	2010 Proposal
Leakage (GWh)	393	362
Annual Average System Pressure (mbar)	28.4	28.1
ASP (All-PE systems excluded) (mbar)	28.1	27.7
MEG Saturation Level	6%	12%

**Table A1.4 North West LDZ**

There is an anticipated decrease of 0.3mbar in overall ASP for North West LDZ, a 0.4mbar decrease in ASP for mixed material systems and an anticipated increase of 6% in MEG Saturation levels.

In addition to the above, there is an anticipated benefit of 16GWh associated with planned Pressure Profiling Equipment installation and the pressure monitoring system upgrade.

### A1.5 West Midlands LDZ

	<b>2009 Proposal</b>	<b>2010 Proposal</b>
<b>Leakage (GWh)</b>	322	288
<b>Annual Average System Pressure (mbar)</b>	31.1	29.6
<b>ASP (All-PE systems excluded) (mbar)</b>	29.3	27.2
<b>MEG Saturation Level</b>	19%	21%

**Table A1.5 West Midlands LDZ**

There is an anticipated decrease of 1.5mbar in overall ASP for West Midlands, a 2.1mbar decrease in ASP for mixed material networks and an anticipated increase of 2% in MEG Saturation levels.

In addition, there is an anticipated benefit of 10GWh associated with planned Pressure Profiling Equipment installation and the pressure monitoring system upgrade.

**Appendix 2: Daily Weighted Average Calorific Values (CVs) for each LDZ for 2008/09 and 2009/10 to-date**

The daily flow weighted average Calorific Values for each LDZ, determined in accordance with the Gas (Calculation of Thermal Energy) Regulations, have been used to determine daily weighted averages for 2009/10. These values have been applied to convert leakage estimates in volume terms to energy quantity for each LDZ; however, the actual daily average CV values over the period will be used for the assessment of the 2010/11 Formula Year. The table below shows the applied values with 2008/09, the values used for the 2009/10 proposals, for comparison purposes.

LDZ	Average Calorific Values (MJ/m <sup>3</sup> )	
	2008/09	2009/10 to-date
Eastern	39.1	39.5
East Midlands	39.2	39.4
North Thames	39.0	39.4
North West	39.2	39.5
West Midlands	39.2	39.3

**Table A2.1 CV Comparison**

There has been a general increase in Calorific Value across each of the LDZs.