LDZ Shrinkage Quantity
Initial Proposals
Formula Year 2009/10

National Grid
1 January 2009

National Grid LDZ Shrinkage Initial Proposals - Formula Year 2009/10

Contents

National Grid LDZ Shrinkage Proposal for Formula Year 2009/10

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 2009/10 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.

On 1 April 2008, Distribution Networks became subject to revised Licence Conditions covering the period 1 April 2008 to 31 March 2013. The revised Licence Conditions regarding Shrinkage, Special Condition E8, significantly changed the manner in which Shrinkage was to be calculated. UNC Modification Proposal 0203V was raised to align the UNC Shrinkage process to the new Gas Transporter Licences; subsequently being approved by Ofgem.

The most significant change to the Shrinkage process was that Shrinkage would no longer be considered to be throughput dependant and, therefore, would be procured on a flat daily basis throughout the year. The principle was adopted for the 2008/09 Gas Year LDZ Shrinkage Procurement.

An additional modification, UNC Modification Proposal 0225, was raised to further align the UNC process to the new Licence Conditions in respect of leakage calculations. Mod 0225 sought to align the UNC Shrinkage process to Formula Year rather than Gas Year so that it is consistent with the Shrinkage Revenue Incentive in the Gas Transporter Licences; this has now been approved by Ofgem. The outcome of this alignment to Formula Year means that it is necessary to project forward two years from an actual leakage assessment, i.e. these 2009/10 proposals are based on the 2007/08 leakage assessment.

National Grid's Initial LDZ Shrinkage Proposals for 2009/10 Formula Year have been determined in accordance with these principles.

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[1]. 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 2008/09 Gas Year (GWh)				Proposed Shrinkage Quantities 2009/10 Formula Year (GWh)			
	Leakage	OUG	Theft	Total	Leakage	OUG	Theft	Total
Eastern	250	5	10	265	230	5	10	245
East Midlands	359	8	15	382	336	8	15	359
North Thames	363	7	13	382	345	7	13	364
North West	471	9	17	496	432	9	17	458
West Midlands	408	6	11	425	381	6	11	399
National Grid	**1,850**	**36**	**65**	**1,951**	**1724**	**36**	**65**	**1824**

Table 1. Proposed LDZ Shrinkage Quantity values for the 2009/10 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.

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)
Eastern	670,314
East Midlands	983,143
North Thames	997,578
North West	1,255,171
West Midlands	1,092,120
National Grid	**4,998,325**

Table 2. Proposed LDZ Daily Shrinkage Quantity Values for 2009/10 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 2009/10 proposal.

3.1 Leakage

Leakage represents the largest component of the LDZ Shrinkage Quantity

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

[1] UNC Modification Proposals 0203V and 0225

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[2] specific information:

- Pipe asset data[3]
- Annual average system pressure in each network
- Measured concentration of Monoethylene Glycol (MEG) joint treatment chemical in the gas.

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[4]	GWh
Eastern	12,234	182
East Midlands	17,696	264
North Thames	18,705	278
North West	26,298	393
West Midlands	21,632	322
National Grid	**96,565**	**1,439**

Table 3. Estimated LDZ Low Pressure Leakage for 2009/10 Formula Year

[2] Network in this context relates to physically interconnected pipe systems, not National Grid's regionally based administrative structure.

[3] Actual asset data as at 31 March 2008 adjusted for completed and planned iron replacement to 31 March 2010.

[4] 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^3.

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

LDZ	Medium Pressure Leakage	
	Tonnes	GWh
Eastern	1,030	15
East Midlands	2,871	43
North Thames	1,834	27
North West	1,319	20
West Midlands	1,657	25
National Grid	**8,711**	**130**

Table 4. Estimated LDZ Medium Pressure Leakage for 2009/10 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[5]	
	Tonnes	GWh
Eastern	2,639	39
East Midlands	2,642	39
North Thames	2,548	38
North West	3,179	47
West Midlands	2,861	43
National Grid	**13,869**	**207**

Table 5. Estimated AGI Emissions for 2009/10 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 as a result of these events. (For the purpose of this paper the number of events in 2007 has been used for the analysis together with emergency personnel response times.)

In addition to the routine events in 2007, there were 110 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 lost as a result of these events was 7 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 2009/10:

[5] Includes leakage and routine equipment venting

LDZ	Interference Damage	
	Tonnes	GWh
Eastern	54	1
East Midlands	107	2
North Thames	130	2
North West	102	2
West Midlands	73	1
National Grid	**466**	**7**

Table 6. 2007/08 (and estimated 2009/10) 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 21st 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 should result in lower average system operating 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.

The anticipated impact of the Pressure Profiler Installation programme is shown in Table 7 below:

LDZ	Leakage Reduction	
	Tonnes per annum	GWh per annum
Eastern	511	8
East Midlands	786	12
North Thames	0	0
North West	1,870	29
West Midlands	624	10
National Grid	**3,791**	**58**

Table 7. Estimated 2009/10 Leakage Reduction Initiative Benefit

3.1.5 Total Leakage

Table 8 below shows the total amount of estimated leakage for Formula Year 2009/10 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	15,445	230	628,891
East Midlands	22,531	336	919,721
North Thames	23,217	345	944,343
North West	29,028	432	1,184,841
West Midlands	25,599	381	1,044,851
National Grid	**115,820**	**1724**	**4,722,648**

Table 8. Estimated 2009/10 Formula Year LDZ Leakage Summary

3.2 Own Use Gas

Under the new UNC regime for Shrinkage, Own Use Gas is treated differently to the previous regime in that, rather than being considered as a factor of daily throughput to be procured on a daily basis it 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 2009/10 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	48,772	5	14,698
East Midlands	74,673	8	22,504
North Thames	62,680	7	18,890
North West	82,808	9	24,956
West Midlands	55,655	6	16,773
National Grid	**324,588**	**36**	**97,821**

Table 9. Estimated 2009/10 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, under the new UNC regime for Shrinkage, Theft of Gas is treated differently to the previous regime in that, rather than being considered as a factor of daily throughput to be procured on a daily basis it 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 2007 are detailed in Table 10 below.

	2007	
	Total	**Transporter Responsible**
Reported incidents of Theft	726	73

Table 10. 2007 Theft of Gas Statistics

The statistics for 2007 indicate that, of the cases of confirmed theft made known to National Grid, 10.1% 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[6]. 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 2007 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. The estimated 2009/10 Theft of Gas Quantity Values are shown in Table 11 below.

LDZ	17 Year Seasonal Normal LDZ Consumption	ToG GWh per annum	ToG kWh per day
Eastern	48,772	10	26,724
East Midlands	74,673	15	40,917
North Thames	62,680	13	34,345
North West	82,808	17	45,374
West Midlands	55,655	11	30,496
National Grid	**324,588**	**65**	**177,857**

Table 11. Estimated 2009/10 LDZ Theft of Gas Quantity Values

3.4 LDZ Shrinkage Quantity Summary

The proposed LDZ Shrinkage Quantity Values for the Formula Year 2009/10, in GWh per annum, are presented in Table 12 below.

[6] Transporter Responsible Theft: 2002 – 4.4%, 2003 – 1.2%, 2004 – 4.0%, 2005 – 3.1%, 2006 – 5.4%

LDZ	Leakage (GWh)	OUG (GWh)	Theft (GWh)	Total (GWh)
Eastern	230	5	10	245
East Midlands	336	8	15	359
North Thames	345	7	13	364
North West	432	9	17	458
West Midlands	381	6	11	399
National Grid	**1724**	**36**	**65**	**1824**

Table 12. Estimated 2009/10 LDZ Shrinkage Quantity Values

The estimated Daily Shrinkage Quantity values, in kWh per day, applicable for the 2009/10 Formula Year are shown in Table 13 below:

LDZ	Leakage (KWh)	OUG (KWh)	Theft (KWh)	Total (KWh)
Eastern	628,891	14,698	26,724	670,314
East Midlands	919,721	22,504	40,917	983,143
North Thames	944,343	18,890	34,345	997,578
North West	1,184,841	24,956	45,374	1,255,171
West Midlands	1,044,851	16,773	30,496	1,092,120
National Grid	**4,722,648**	**97,821**	**177,857**	**4,998,325**

Table 13. Estimated 2009/10 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 0.2mbar.

There is an anticipated increase in MEG concentration of 8% in absolute levels (10% in 2007/08 to an anticipated 18% in 2009/10).

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 2009/10 leakage assessment; equating to approximately 3600km of iron main from April 2008, i.e. approximately 1800km 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 2009/10. 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[7] 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.

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 2009/10.

[7] 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.

Appendix 1: LP Pipe and Service Leakage Analysis 2008 to 2009 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 2009 with 2008 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.

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.

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

A1.1 Eastern LDZ

	2008 Proposal	2009 Proposal
Leakage (GWh)	195	182
Annual Average System Pressure (mbar)	33.4	32.3
ASP (All-PE systems excluded) (mbar)	32.5	31.4
MEG Saturation Level	0%	0%

Table A1.1 Eastern LDZ

There is an anticipated decrease of 1.1mbar in overall ASP for Eastern LDZ and also, more significantly, a decrease in ASP of 1.1mbar 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, there is an anticipated benefit of 8GWh associated with planned Pressure Profiling Equipment installation.

The benefits of the mains replacement, decreased ASP and investment in pressure profiling equipment have led to an anticipated decrease in leakage equivalent to 13GWh.

A1.2 East Midlands LDZ

	2008 Proposal	2009 Proposal
Leakage (GWh)	275	264
Annual Average System Pressure (mbar)	34.0	33.7
ASP (All-PE systems excluded) (mbar)	32.1	31.8
MEG Saturation Level	22%	24%

Table A1.2 East Midlands LDZ

There is an anticipated decrease of 0.3mbar in overall ASP for East Midlands LDZ and also, more significantly, a 0.3mbar decrease in ASP for mixed material systems. There is a slight anticipated increase of 2% in MEG Saturation levels.

In addition, there is an anticipated benefit of 12GWh associated with planned Pressure Profiling Equipment installation.

The benefits of the mains replacement, decreased ASP, increased MEG Saturation and investment in pressure profiling equipment have led to an anticipated decrease in leakage equivalent to 11GWh.

A1.3 North Thames LDZ

	2008 Proposal	2009 Proposal
Leakage (GWh)	297	278
Annual Average System Pressure (mbar)	26.1	25.5
ASP (All-PE systems excluded) (mbar)	26.1	25.5
MEG Saturation Level	12%	19%

Table A1.3 North Thames LDZ

There is an anticipated decrease of 0.6mbar in ASP for North Thames LDZ and an increase of 7% in MEG Saturation levels.

The benefits of the mains replacement, decreased ASP, and increased MEG Saturation have led to an anticipated decrease in leakage equivalent to 21GWh.

A1.4 North West LDZ

	2008 Proposal	2009 Proposal
Leakage (GWh)	400	393
Annual Average System Pressure (mbar)	27.9	28.4
ASP (All-PE systems excluded) (mbar)	27.6	28.1
MEG Saturation Level	3%	6%

Table A1.4 North West LDZ

There is an anticipated increase of 0.5mbar in overall ASP for North West LDZ and also, more significantly, a 0.5mbar increase in ASP for mixed material systems. However, this is offset by an increase of 3% in MEG Saturation levels and an anticipated 29GWh benefit associated with pressure profiling equipment.

The benefits of the mains replacement, decreased ASP, increased MEG Saturation and investment in pressure profiling equipment have led to an anticipated decrease in leakage equivalent to 7GWh.

A1.5 West Midlands LDZ

	2008 Proposal	2009 Proposal
Leakage (GWh)	339	322
Annual Average System Pressure (mbar)	30.9	31.1
ASP (All-PE systems excluded) (mbar)	29.1	29.3
MEG Saturation Level	3%	19%

Table A1.5 West Midlands LDZ

There is an anticipated increase of 0.2mbar in overall ASP for West Midlands and also a 0.2mbar increase in ASP for mixed material networks. However, this is offset by an anticipated increase of 16% in MEG Saturation levels and an anticipated 10GWh benefit associated with pressure profiling equipment. Together with mains replacement, these factors have led to an anticipated decrease in leakage in West Midlands LDZ of 17GWh.

Appendix 2: Flow-Weighted Average Calorific Values (CVs) for each LDZ for 2006/07 and 2007/08

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 flow-weighted averages for 2007/08. These 2007/08 values have been applied to convert leakage estimates in volume terms to energy quantity for each LDZ; however, the actual average CV values over the period will be used for the assessment of the 2009/10 Formula Year. The values are presented in the table below with 2006/07 for comparison purposes.

LDZ	Average Calorific Values (MJ/m^3)	
	2006/07	2007/08
Eastern	39.5	39.1
East Midlands	39.6	39.2
North Thames	39.3	39.0
North West	39.5	39.2
West Midlands	39.4	39.2