

**LDZ Shrinkage Quantity  
Initial Proposals  
Formula Year 2011/12**

**National Grid  
1 January 2011**

## National Grid LDZ Shrinkage Initial Proposals - Formula Year 2011/12

<b>Section</b>	<b><u>Contents</u></b>	<b>Page</b>
<b>1.</b>	<b>Purpose of Proposal.....</b>	<b>1</b>
<b>2.</b>	<b>Summary of Proposal.....</b>	<b>2</b>
<b>3.</b>	<b>Component Analysis .....</b>	<b>2</b>
3.1	Leakage.....	2
3.1.1	Distribution Mains (and Services) Leakage .....	3
3.1.2	AGI Leakage and Venting.....	4
3.1.3	Other Losses.....	4
3.1.4	Leakage Reduction Initiatives .....	5
3.1.5	Total Leakage .....	5
3.2	Own Use Gas .....	6
3.3	Theft of Gas.....	6
3.4	LDZ Shrinkage Quantity Summary .....	7
<b>4.</b>	<b>Detailed Analysis .....</b>	<b>8</b>
4.1	Leakage.....	8
<b>5.</b>	<b>Extent to which the Proposal would better facilitate the relevant objectives .....</b>	<b>8</b>
<b>6.</b>	<b>The implications for National Grid of implementing the Proposal .....</b>	<b>8</b>
<b>7.</b>	<b>The implications of implementing the Proposal for Users.....</b>	<b>9</b>
<b>8.</b>	<b>Analysis of any advantages or disadvantages of implementation of the Proposal.....</b>	<b>9</b>
<b>9.</b>	<b>Summary of the representations (to the extent that the import of those representations are not reflected elsewhere in the Proposal).....</b>	<b>9</b>
<b>10.</b>	<b>Programme of works required as a consequence of implementing the Proposal.....</b>	<b>9</b>
<b>11.</b>	<b>Proposed implementation timetable (inc timetable for any necessary information system changes).....</b>	<b>9</b>
<b>12.</b>	<b>Recommendation concerning the implementation of the Proposal.....</b>	<b>9</b>
<b>13.</b>	<b>National Grid's Proposal .....</b>	<b>9</b>
<b>Appendix 1:</b>	<b>LP Pipe and Service Leakage Analysis 2010 to 2011 proposals by LDZ .....</b>	<b>10</b>
<b>Appendix 2:</b>	<b>Assumed Daily Weighted Average Calorific Values (CVs) for each LDZ .....</b>	<b>12</b>

## **National Grid LDZ Shrinkage Proposal for Formula Year 2011/12**

### **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 2011/12, 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.

Following representations from Users, a further paper will be issued, by 1 March 2011, 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

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 Quantities have been determined are included in this paper.

LDZ	Existing Shrinkage Quantities 2010/11 Formula Year (GWh)				Proposed Shrinkage Quantities 2011/12 Formula Year (GWh)			
	Leakage	OUG	Theft	Total	Leakage	OUG	Theft	Total
<b>Eastern</b>	230	5	9	244	221	5	9	235
<b>East Midlands</b>	312	7	13	333	304	7	13	325
<b>North Thames</b>	338	6	12	356	339	6	11	356
<b>North West</b>	418	8	15	441	406	8	14	428
<b>West Midlands</b>	345	6	10	361	334	5	10	349
<b>National Grid</b>	<b>1,642</b>	<b>33</b>	<b>59</b>	<b>1,734</b>	<b>1,603</b>	<b>32</b>	<b>58</b>	<b>1,692</b>

Table 1. Proposed LDZ Shrinkage Quantity values for the 2011/12 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 forecast mains replacement for 2011/12, the reduction in leakage also reflects the impact of improved pressure management, improved MEG saturations and additional mains replacement above that planned for the 2010/11 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>	642,318
<b>East Midlands</b>	886,705
<b>North Thames</b>	973,931
<b>North West</b>	1,168,764
<b>West Midlands</b>	952,576
<b>National Grid</b>	<b>4,624,294</b>

Table 2. Proposed LDZ Daily Shrinkage Quantity Values for 2011/12 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 2011/12 proposal.

### 3.1 Leakage

Leakage represents the largest component of the LDZ Shrinkage Quantity. Leakage is estimated using the agreed leakage model, which is controlled under Special Condition E9 of the GDN Licences. Under Special Condition E9 (7), Distribution Networks have the obligation to annually review the leakage model to ensure that it meets the obligations, specified under section 4, of:

- (a) the accurate calculation and reporting of gas leakage from each of the LDZs operated by the licensee; and
- (b) being consistent with, and where reasonably practicable, identical to Leakage Models used by other DN Operators.

Any proposed modifications to the leakage model would be subject to consultation with the industry, be independently assessed and submitted to Ofgem for approval.

DNs also have an obligation by 31 July each year to assess and publish the leakage volume for the previous financial year; the latest approved model is used for this assessment.

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>1</sup> specific information:

- Pipe asset data<sup>2</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 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>3</sup>	GWh
Eastern	10,998	165
East Midlands	14,695	221
North Thames	18,468	277
North West	22,754	339
West Midlands	18,035	269
<b>National Grid</b>	<b>84,949</b>	<b>1,271</b>

Table 3. Estimated LDZ Low Pressure Leakage for 2011/12 Formula Year

<sup>1</sup> Network in this context relates to physically interconnected pipe systems, not National Grid's regionally based administrative structure.

<sup>2</sup> Actual asset data as at 31 March 2010 adjusted for completed and planned iron replacement to 31 March 2012.

<sup>3</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>	1,004	15
<b>East Midlands</b>	2,844	43
<b>North Thames</b>	1,693	25
<b>North West</b>	1,229	18
<b>West Midlands</b>	1,570	23
<b>National Grid</b>	<b>8,340</b>	<b>125</b>

Table 4. Estimated LDZ Medium Pressure Leakage for 2011/12 Formula Year

### 3.1.2 AGI Leakage and Venting

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 and venting on an LDZ basis:

LDZ	AGI Emissions <sup>4</sup>	
	Tonnes	GWh
<b>Eastern</b>	2,698	40
<b>East Midlands</b>	2,662	40
<b>North Thames</b>	2,402	36
<b>North West</b>	3,218	48
<b>West Midlands</b>	2,685	40
<b>National Grid</b>	<b>13,665</b>	<b>204</b>

Table 5. Estimated AGI Emissions for 2011/12 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 2009 has been used for the analysis together with emergency personnel response times.)

In addition to the routine events in 2009, there were 34 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 0.3 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 2011/12:

<sup>4</sup> Includes leakage and routine equipment venting

LDZ	Interference Damage	
	Tonnes	GWh
Eastern	30	0
East Midlands	55	1
North Thames	40	1
North West	53	1
West Midlands	50	1
<b>National Grid</b>	<b>229</b>	<b>3</b>

Table 6. 2009/10 (and estimated 2011/12) 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-one 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 has had a direct impact on 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. National Grid embarked upon a programme of installing pressure profiling equipment, with the aim of lowering 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; typically ASP had been in the order of 30mbarg. However, with the increased focus on pressure management, the installation of profiling equipment and system upgrade there has been a significant reduction in average system pressure in National Grid's mixed material networks. The calculated ASP in 2009/10 was 28.4mbarg and the forecast ASP for 2010/11, and that used for these proposals, is 27.8mbarg. This represents a 7% reduction in ASP resulting in a significant reduction in leakage in the current price control period.

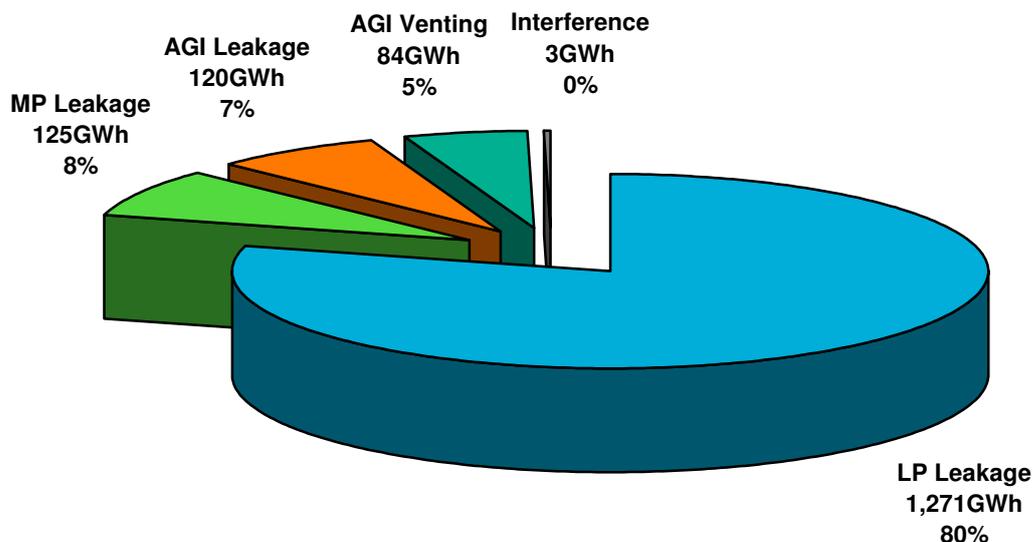
### 3.1.5 Total Leakage

Table 7 below shows the total amount of estimated leakage for Formula Year 2011/12 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	14,730	221	603,696
East Midlands	20,256	304	831,458
North Thames	22,603	339	925,245
North West	27,254	406	1,108,207
West Midlands	22,340	334	912,090
<b>National Grid</b>	<b>107,184</b>	<b>1,603</b>	<b>4,380,695</b>

Table 7. Estimated 2011/12 Formula Year LDZ Leakage Summary

The diagram below illustrates the relative proportions of the various elements that make up the leakage estimation for the 2011/12 Shrinkage proposals.



### 3.2 Own Use Gas

Own Use Gas is treated as a consolidated Quantity, calculated as a factor of 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 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 has been applied since the 2005/06 Gas Year.

The estimated 2011/12 Own Use Gas Quantity values are shown in Table 8 below.

LDZ	Seasonal Normal LDZ Consumption	OUG GWh per annum	OUG kWh per day
Eastern	45,599	5	13,705
East Midlands	65,226	7	19,604
North Thames	57,480	6	17,276
North West	71,497	8	21,488
West Midlands	47,800	5	14,366
<b>National Grid</b>	<b>287,602</b>	<b>32</b>	<b>86,439</b>

Table 8. Estimated 2011/12 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 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. In recent years, Transporter Responsible Theft has been deemed 0.02% of LDZ Consumption. For 2011/12, National Grid proposes to retain a Theft of Gas factor equal to 0.02%. Table 9 below shows the estimated 2011/12 Theft of Gas Quantity Values:

LDZ	Seasonal Normal LDZ Consumption	ToG GWh per annum	ToG kWh per day
Eastern	45,599	9	642,318
East Midlands	65,226	13	886,705
North Thames	57,480	11	973,931
North West	71,497	14	1,168,764
West Midlands	47,800	10	952,576
<b>National Grid</b>	<b>287,602</b>	<b>58</b>	<b>4,624,294</b>

Table 9. Estimated 2011/12 LDZ Theft of Gas Quantity Values

### 3.4 LDZ Shrinkage Quantity Summary

Table 10 below shows the proposed LDZ Shrinkage Quantity Values for the Formula Year 2011/12 in GWh per annum:

LDZ	Leakage (GWh)	OUG (GWh)	Theft (GWh)	Total (GWh)
Eastern	221	5	9	235
East Midlands	304	7	13	325
North Thames	339	6	11	356
North West	406	8	14	428
West Midlands	334	5	10	349
<b>National Grid</b>	<b>1,603</b>	<b>32</b>	<b>58</b>	<b>1,692</b>

Table 10. Estimated 2011/12 LDZ Shrinkage Quantity Values

The diagram below illustrates the relative proportions of the individual elements that make up the 2011/12 Shrinkage Quantity proposals.

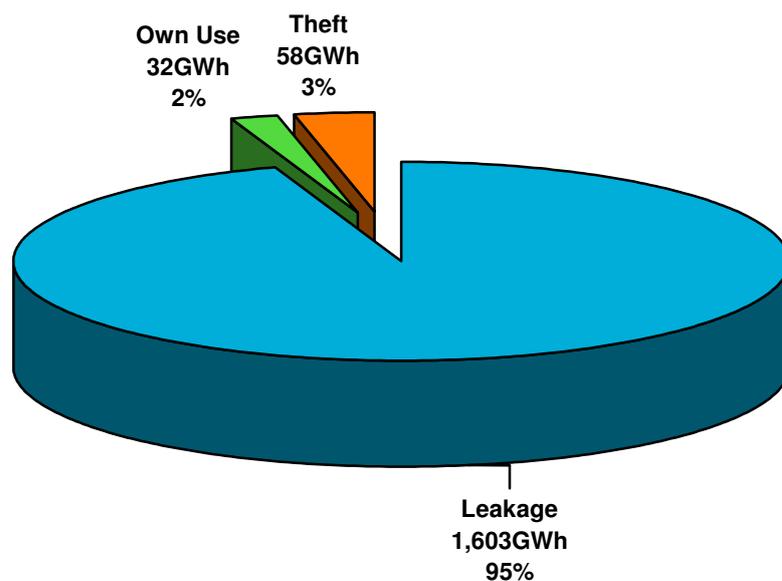


Table 11 below shows the estimated Daily Shrinkage Quantity values applicable for the 2011/12 Formula Year in kWh per day:

LDZ	Leakage (KWh)	OUG (KWh)	Theft (KWh)	Total (KWh)
<b>Eastern</b>	603,696	13,705	24,917	642,318
<b>East Midlands</b>	831,458	19,604	35,643	886,705
<b>North Thames</b>	925,245	17,276	31,410	973,931
<b>North West</b>	1,108,207	21,488	39,069	1,168,764
<b>West Midlands</b>	912,090	14,366	26,120	952,576
<b>National Grid</b>	<b>4,380,695</b>	<b>86,439</b>	<b>157,159</b>	<b>4,624,294</b>

Table 11. Estimated 2011/12 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; these 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 and, 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 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 2011/12 leakage assessment; equating to approximately 4000km of iron main from April 2009, i.e. approximately 2000km per annum.

#### 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 2011/12. 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 2011.

Users wishing to discuss any matter can do so either 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 2011<sup>5</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 2011 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 2011.

**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 2011.

**13. National Grid's Proposal**

This report contains our Initial Proposals for the LDZ Daily Shrinkage Quantity values for the Formula Year 2011/12.

---

<sup>5</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.

## **Appendix 1: LP Pipe and Service Leakage Analysis 2010 to 2011 proposals by LDZ**

This section of the document provides a comparison of the estimated levels of LP pipe and service leakage by LDZ; LP Leakage accounts for approximately 80% of total leakage.

Details of leakage in energy quantity, annual Average System Pressures (ASP) and Monoethylene Glycol (MEG) levels are presented for 2011/12 with 2010/11<sup>6</sup> estimates 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>2010 Proposal</b>	<b>2011 Proposal</b>
<b>Leakage (GWh)</b>	179	165
<b>Annual Average System Pressure (mbar)</b>	32.1	30.1
<b>ASP (All-PE systems excluded) (mbar)</b>	31.1	28.8
<b>MEG Saturation Level</b>	0%	0%

**Table A1.1 Eastern LDZ**

In comparison to last years anticipated leakage performance, there is an anticipated decrease of 1.1mbar in overall ASP for Eastern LDZ and a 2.3mbar decrease in ASP for mixed material networks. This, together with anticipated mains replacement, is expected to deliver a leakage reduction of 14GWh.

### **A1.2 East Midlands LDZ**

	<b>2010 Proposal</b>	<b>2011 Proposal</b>
<b>Leakage (GWh)</b>	238	222
<b>Annual Average System Pressure (mbar)</b>	33.2	32.2
<b>ASP (All-PE systems excluded) (mbar)</b>	31.2	30.4
<b>MEG Saturation Level</b>	23%	23%

**Table A1.2 East Midlands LDZ**

In comparison to last years anticipated leakage performance, there is an anticipated decrease of 1.0mbar in overall ASP for East Midlands LDZ and a 0.8mbar decrease in ASP for mixed

<sup>6</sup> The 2010 proposal parameters and quoted leakage shown do not reflect within-year pressure management investment; this was taken into account as a separate adjustment to the final leakage estimate. However, the difference in leakage will include the impact of this.

material networks. This, together with anticipated mains replacement, is expected to deliver a leakage reduction of 16GWh.

### A1.3 North Thames LDZ

	2010 Proposal	2011 Proposal
Leakage (GWh)	278	276
Annual Average System Pressure (mbar)	25.6	26.1
ASP (All-PE systems excluded) (mbar)	25.6	26.1
MEG Saturation Level	11%	9%

**Table A1.3 North Thames LDZ**

In comparison to last years anticipated leakage performance, there is an anticipated increase of 0.5mbar in ASP for North Thames and a 2% decrease in MEG Saturation. Anticipated mains replacement, being offset by the change in operating performance, is expected to deliver a net leakage reduction of 2GWh.

### A1.4 North West LDZ

	2010 Proposal	2011 Proposal
Leakage (GWh)	362	339
Annual Average System Pressure (mbar)	28.1	27.8
ASP (All-PE systems excluded) (mbar)	27.7	27.4
MEG Saturation Level	12%	12%

**Table A1.4 North West LDZ**

In comparison to last years anticipated leakage performance, there is an anticipated decrease of 0.3mbar in overall ASP for North West and a 0.3mbar decrease in ASP for mixed material networks. This, together with anticipated mains replacement, is expected to deliver a leakage reduction of 23GWh.

### A1.5 West Midlands LDZ

	2010 Proposal	2011 Proposal
Leakage (GWh)	288	273
Annual Average System Pressure (mbar)	29.6	28.3
ASP (All-PE systems excluded) (mbar)	27.2	26.7
MEG Saturation Level	21%	21%

**Table A1.5 West Midlands LDZ**

In comparison to last years anticipated leakage performance, there is an anticipated decrease of 1.3mbar in overall ASP for West Midlands and a 0.5mbar decrease in ASP for mixed material networks. This, together with anticipated mains replacement, is expected to deliver a leakage reduction of 15GWh.

## **Appendix 2: Assumed Daily Weighted Average Calorific Values (CVs) for each LDZ**

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 estimate daily weighted averages for 2010/11 to date. These values have been applied to convert leakage estimates in volume terms to energy quantity for each LDZ for these proposals; however, the actual daily average CV values over the period will be used for the assessment of the 2011/12 Formula Year. The table below shows the values applied for these proposals and those used for the 2010/11 proposals, for comparison purposes.

<b>LDZ</b>	<b>Average Calorific Values (MJ/m<sup>3</sup>)</b>	
	<b>2010/11 Proposals</b>	<b>2010/11 to-date</b>
Eastern	39.5	39.4
East Midlands	39.4	39.5
North Thames	39.4	39.4
North West	39.5	39.1
West Midlands	39.3	39.3

**Table A2.1 CV Comparison**