

CODE REVIEW PROPOSAL No 0251
Review of the Determination of Daily Calorific Values
Version 1.0

Date: 06/04/2009

Nature and Purpose of Proposal

Calorific value (CV) is a measure of the amount of energy (in the form of heat) that is released when a gas is burnt. Natural gas is predominantly a mixture of hydrocarbon gases and it is these which, when burnt, provide virtually all the liberated energy. The UK's gas comes from a variety of gas fields, each containing differing proportions of hydrocarbons, hence different CVs are seen at different network entry points and the CV of gas burnt by consumers also varies according to their location.

CV information is provided daily to gas shippers and suppliers and is used by them to bill their gas consumers for the energy they use. The methodology for calculating the daily CV within each charging zone is designed to ensure that gas consumers within a zone are not at material risk of being charged for energy not supplied due to local variations in the CV of the gas entering that zone.

The methodology that is currently used for determining the daily billable CV for each charging zone is enshrined within the Gas (Calculation of Thermal Energy) Regulations 1996 (as amended) (the "Regulations"). In summary, paragraph 4(A) of the Regulations says that the daily CV for a charging zone shall be the lowest of:

- The flow weighted average CV calculated across all of the inputs into the charging zone; or
- The average CV measured at any of the individual input points to the charging zone, plus 1MJ/m³.

This means that the daily CV used by shippers for billing gas consumers in each charging zone can be effectively capped at 1MJ/m³ above the lowest average CV source entering that charging zone, no matter how little the amount (volume) of low CV gas is delivered on that Day. Conversely, at entry, the energy associated with all inputs to the system is derived from actual measured CVs at each of the various delivery facilities. Therefore, a mismatch can arise between the total amount of energy (kWh) delivered into the system on a day and the total amount of energy that is deemed to have been offtaken by gas consumers, this difference being "unbilled" energy. Any such "unbilled" energy is procured by National Grid NTS to make up the shortfall in the daily energy balance. This is known as CV Shrinkage and a proportion of the cost of this energy procurement is currently redistributed to NTS shippers through NTS Commodity charges. In some instances, this proportion would be 100%.

Historically, UKCS production has been high and stable, which has meant that CV related shrinkage has been at relatively low levels. However, as the UK moves towards a greater diversity of supplies, this will almost certainly mean a greater variance in CV between different sources of gas imported from different countries. Furthermore, the development of biogas and coal bed methane projects in the UK is likely to introduce low volume, and potentially lower CV gas into the system which may lead to a greater propensity for CV capping effects under the current regime. Whilst at present such projects are at an early stage of development, a key enabler for them was the implementation of Modification 0154

“Enduring Provisions for LDZ Entry Points” in October 2007, which established an enduring framework for new entry and storage to connect directly into Distribution Networks.

The potential for greater volumes of unbilled energy to arise due to the changing topology of supplies to the network was first highlighted by National Grid NTS in its SO Incentives consultation document “National Grid Gas and Electricity System Operator Incentives, Initial Proposals Consultation, 7th December 2007” (pages 53-55). As a result of its analysis presented in that document, National Grid NTS considered that it may be timely to review the CV capping rules – a view supported by a number of respondents to that consultation. In addition, Ofgem has called for this review in its last two sets of final proposals for SO Incentives¹ and has also made clear who it expects to be involved. In its decision letter for Modification Proposal 0236, Ofgem stated, “As part of NGG’s consultation on the system operator (SO) incentives scheme from April 2009, it has indicated that it will look to take this issue forward via the appropriate workstream. However in order to enable this to be effective it is necessary for gas distribution owners to also be involved in this process. Ofgem would welcome this initiative and would urge distribution and transmission companies to work with shippers via a workstream to identify a way forward”.²

National Grid NTS therefore proposes that the industry reviews the current methodology for determination of daily billable CVs. The review will, implicitly, include a review of the CV shrinkage calculation.

It is therefore proposed that a Review Group be established to:

- review the existing flow weighted average CV and CV shrinkage arrangements;
- consider the issues which impact on the accuracy of the flow weighted average CV methodology when comparing actual energy delivered to the system against that which is billed to gas consumers;
- develop potential solutions to resolve any issues identified;
- if necessary, explore the process for amendment to the Regulations; and
- develop relevant amendments to the Regulations and UNC to deliver any proposed changes to the current arrangements.

It is anticipated that the timescales over which the review will run will enable an amendment to the Regulations and any consequential UNC Modification Proposals to be raised and implemented prior to 1st April 2010.

Draft Terms of Reference for this Review Group have been attached to this Review Proposal though it is anticipated that an initial task of the Review Group will be to review and amend these Terms of Reference where necessary prior to their formal approval at a subsequent UNC Modification Panel.

Furthermore it is recommended that an offer to participate in this Review Group be extended

¹ ‘National Grid Electricity Transmission and National Grid Gas System Operator Incentives from 1st April 2008, Final Proposals Consultation, 27th February 2008’ p.27 and ‘National Grid Electricity Transmission and National Grid Gas System Operator Incentives from 1st April 2009, Final Proposals Consultation, 27th February 2009’ p.35.

² Modification Proposal 0236, “Amendment to Px (TGPP) Limited Network Entry Agreement”, Ofgem decision letter, 27th January 2009.

beyond current UNC signatories to include Ofgem and any other parties having an interest. This could include the government Department of Energy and Climate Change (DECC), gas consumers and their representative bodies.

Any further information (Optional)

Code Concerned, sections and paragraphs

Uniform Network Code

Transportation Principal Document

Section(s) UNC Principal Document Section N

Proposer's Representative

Phil Hobbins

Proposer

National Grid NTS

Draft Terms of Reference v0.1

UNC Modification Reference Number 0251

Review of the Determination of Daily Calorific Values

Purpose

This Review Proposal seeks to investigate the appropriateness of the current methodology for calculating daily billable calorific values and its impact on CV Shrinkage. Where issues are identified the Review Group should explore options and make recommendations to resolve them.

Background

The calorific value (CV) of natural gas determines the amount of energy transported. CV information is provided daily to gas shippers and suppliers and is used by them to bill their gas consumers for the energy they use. The methodology for calculating the daily CV within each charging zone is designed to ensure that gas consumers within a zone are not at material risk of being charged for energy not supplied due to local variations in the CV of the gas entering that zone.

The methodology that is currently used for determining the daily billable CV for each charging zone is enshrined within the Gas (Calculation of Thermal Energy) Regulations 1996 (as amended 1997) (the “Regulations”). In summary, the methodology detailed in paragraph 4(A) of the Regulations says that the daily CV for a charging zone shall be the lowest of:

- The flow weighted average CV calculated across all of the inputs into the charging zone; or
- The average CV measured at any of the individual input points to the charging zone, plus 1MJ/m^3 .

This means that the daily CV used by shippers for billing gas consumers in each charging zone can be effectively capped at 1MJ/m^3 above the lowest average CV source entering that charging zone, no matter how little the amount (volume) of low CV gas is delivered on that Day. Conversely, at entry, the energy associated with all inputs to the system is derived from actual measured CVs at each of the various delivery facilities. Therefore, a mismatch can arise between the total amount of energy (kWh) delivered into the system on a day and the total amount of energy that is deemed to have been offtaken by gas consumers, this difference being “unbilled” energy. Any such “unbilled” energy is procured by National Grid NTS to make up the shortfall in the daily energy balance. This is known as CV Shrinkage and a proportion of the cost of this energy procurement is currently redistributed to NTS shippers through NTS Commodity charges. In some instances, this proportion would be 100%.

Historically, UKCS production has been high and stable, which has meant that CV related shrinkage has been at relatively low levels. However, as the UK moves towards a greater

diversity of supplies, this will almost certainly mean a greater variance in CV between different sources of gas imported from different countries. Furthermore, the development of biogas and coal bed methane projects in the UK is likely to introduce low volume, and potentially lower CV gas into the system which may lead to a greater propensity for CV capping effects under the current regime. Whilst at present such projects are at an early stage of development, a key enabler for them was the implementation of Modification 0154 “Enduring Provisions for LDZ Entry Points” in October 2007, which established an enduring framework for new entry and storage to connect directly into Distribution Networks.

National Grid NTS first drew attention to the potential need for reform in this area in December 2007 and has since been supported by Ofgem and others. Indeed, Ofgem have recently urged National Grid NTS, Distribution Network Operators and shippers to work together to explore the issues.

Scope and Deliverables

The Review Group’s remit will be as follows:

- Consider the current rules for calculating daily billable CVs based on the current gas supply topology;
- Explore future gas network flow scenarios associated with:
 - potential new sources of gas entering the NTS and/or directly entering DNs;
 - deliveries from existing sub-terminals if all were to adopt the full range of gas quality parameters as set out in the Gas Safety (Management) Regulations 1996 and in Appendix 5 of National Grid NTS’s Ten Year Statement;
- From the identified future gas network flow scenarios, forecast levels of unbilled energy based on the current rules for calculating daily billable CVs;
- Analyse the cost impacts of the future unbilled energy scenarios, in particular, assessing whether any parties may be unduly disadvantaged;
- Develop alternative methodologies for the calculation of daily billable CVs, forecast their cost impact on the various parties and explore the pros and cons of each;
- Consider the appropriateness of current CV measurement processes within the DNs;
- Identify the governance arrangements associated with a change to the Regulations and process for implementation;
- Develop, by consensus, any relevant amendments to the Regulations and to UNC to deliver any proposed changes to the current arrangements; and
- Identify the impact on processes and procedures associated with the implementation of any alternative methodologies.

The Review Group will provide a written report to the UNC Panel and the final target deliverable shall be to submit any proposed changes to the Regulations and UNC that have received consensus approval within the Review Group to the UNC Panel by 1st April 2010.

Limits

The Review Group shall focus on changes to the Regulations and, if necessary, to the UNC, pertaining to the calculation of daily billable CVs. If, during the course of this review, it becomes apparent that other industry arrangements have potential interactions with the outputs from this Review Group, the Review Group may consider the effects that those arrangements may have on this Group's deliberations.

The Review Group will focus on developing proposals for change that efficiently address any issues identified in a proportionate and cost effective manner.

Composition of Review Group

Since the potential impacts of changes to the daily CV calculation methodology could be wide-ranging and are as yet uncertain it is desirable that the composition of the Review Group covers as many interested parties as possible. It is proposed that, as a minimum, the Review Group is comprised of representatives from National Grid NTS, other Transporters, UNC Users and Ofgem. Representatives from DECC, gas consumers and their representative bodies would also be most welcome.

Timetable

It is proposed that a total period of 6 months be allowed to conclude this review.

Although the frequency of meetings will be subject to review and potential change by the Review Group it is suggested that the frequency of the meetings be once a month.

Meetings will be administered by the Joint Office and conducted in accordance with the Chairman's Guidelines.

Name	Organisation
Phil Hobbins	National Grid NTS