Joint Office of Gas Transporters

Review Group Report

Energy Market Issues for Biomethane Projects (EMIB)

Summary and Recommendations

The following recommendations have been accepted by National Grid, Scotia Gas Networks and Wales & West Utilities, each of whom intend implementing the recommended approach. However, Northern Gas Networks wish to retain responsibility for odorising gas and hence intend implementing a different approach to that of the other companies.

Area Reviewed	Group Conclusion	Action Required
GDN connection policies	Entry facilities should be provided as a competitive service; GDNs should provide a "minimum connection" (remotely operated valve and suitable telemetry); Entry facilities should comply with an industry standard functional specification; No case has been made to change the existing deep connection charging policy at present[1].	GDNs to develop Network Entry Agreements (NEAs) that reflect agreed approach. Functional Specification, to be maintained by GDNs and referenced in relevant NEAs. GDNs to specifically reference entry in Connection Charging Statements.
Network capacity availability	Firm capacity offered by GDNs should be limited to the minimum demand downstream of the entry point; Interruptible capacity should be offered if insufficient firm capacity is available to meet customer needs; Investment to meet existing firm capacity commitments should be regarded by	Entry capacity rights should be enshrined in the relevant NEA. Ofgem to confirm that investment to meet existing capacity commitments will be regarded in the same way as other economically and efficiently incurred network investment

[1] EMIB noted that a new transportation charge/credit has been proposed through UNC Modification 0391.

	Ofgem in the same way as other economically and efficiently incurred network investment.	
Technical standards for calorific value (CV)	CV determination devices with a maximum permissible error of +/-0.5 MJ/m^3 are recommended for entry flows up to 2.5 million m^3; A streamlined and well understood process should be established for approval of CV determination devices.	Interested parties to put forward suitable devices. GDNs to request that Ofgem approve suggested devices. Ofgem to develop an appropriate governance framework for approving CV determination devices.
Gas quality regulation	Risk assessment should determine which gas quality parameters should be monitored, the frequency of measurement and the speed of response of measurement systems; The recommended limit values should also be assessed by risk assessment; The water dew temperature specification should be relaxed; The GS(M)R less than 0.2% oxygen requirement should be reviewed following the conclusion of the current study into the possible effects on pipeline corrosion of elevated oxygen levels; Delivery facilities connected to gas distribution networks should be exempt from the need to hold a Gas Transporter Licence.	NEAs to specify relaxed water dew temperature specification. WWU to complete corrosion study and ENA to put appropriate oxygen level to HSE for approval. DECC to arrange for a Class Exemption from the Gas Transporter Licence in respect of delivery facilities connected to gas distribution networks

Data requirements and transmission	The Gas (Calculation of Thermal Energy) Regulations inappropriately presume GDN ownership of CV measurement equipment The Gas (Calculation of Thermal Energy) Regulations requirements to transfer and store large amounts of data are disproportionate for small entry points.	Ofgem and GDN lawyers to agree how the Regulations are to be applied in the context of biomethane entry. Dependent on the legal assessment, DECC to consider amending the Gas (Calculation of Thermal Energy) Regulations to recognise non-GDN ownership of CV measurement equipment; If the regulations are amended to apply to the proposed biomethane entry arrangements, the amendment should include a reduction in the data requirements. Pending any change to the Regulations, the Functional Specification and NEAs should include requirements that protect consumers appropriately.

Introduction

On 16 September 2011, Ofgem issued an invitation to join a Review Group on Energy Market Issues for Biomethane Projects (EMIB). The Joint Office of Gas Transporters was asked to provide a secretariat for the Review. This Report was drafted by the Joint Office and was approved at the 11 May 2012 EMIB meeting. Ofgem's invitation letter included Terms of Reference, which were accepted by the Group. These are attached as Appendix 1 below.

Six EMIB meetings were held to progress the Review, together with six supporting meetings of relevant experts to consider a range of issues. A generic risk assessment was also conducted to support development of a proportionate functional specification. A wide range of parties was involved in the discussions – Appendix 2 provides a list of attendees.

Context

The established requirements for entry to the GB gas network were developed primarily with major beach terminals in mind. Biomethane differs from this traditional entry expectation both in terms of scale and location, being embedded within local distribution networks rather than connected at the perimeter of the National Transmission System.

The first key issue raised in the EMIB discussions was the relative scale of expected biomethane entry. In broad terms, a typical entry point may be about 1,000th of the scale of a beach terminal. Given this, the proportion of costs accounted for by gas transporter requirements for the entry facility (e.g. metering and gas quality assessment and reporting) would be substantially higher if the defined standards and processes are the same as those at beach terminals. This cost, potentially together with complexity associated with entry arrangements, has the potential to deter entry. The group therefore challenged whether the requirements were proportionate in the context of numerous, relatively small, entry points. To the extent that entry costs can be lowered, this could encourage development of additional sources of biomethane, and would help to ensure that undue costs are not introduced to the market.

The scale and number of potential entry points leads to the second key point, which is consistency. Uncertainty was identified as a barrier to entry, with potential entrants not knowing the conditions they have to meet. The REA (Renewable Energy Association) gave examples to the group of substantial variations in the terms and costs that have been quoted by GDNs (Gas Distribution Networks) to potential entrants. It was recognised that establishing a single national set of standards would remove uncertainty and hence a potential barrier to entry. It would also support the development of competitive infrastructure provisions since different providers could develop competing products to deliver the common specification, and cost reductions should also be delivered as a result of requirements being replicated at all sites.

Report on Areas Considered

The group considered each of the areas outlined in the Terms of Reference.

GDN connection policies

Understand how the existing connection policy operates and establish whether this introduces any barriers or uncertainty to facilitating connections to the grid.

The GDNs presented their existing connection policy, which is consistent across the networks. This is based on a deep connections approach – with those connecting to the network asked to meet the full cost of all the work necessary to support that connection, both at the connection point itself and within the network to the extent that investment is necessary to meet the requirements specified by the connecting party. In the context of biomethane entry, this would involve the connectee meeting the costs associated with developing the entry facility. In terms of deeper, within network, investment, the only potential cost foreseen is when there is insufficient downstream demand to accommodate the planned flow into the distribution network. In these cases, it may be possible for the planned flow to be accepted following investment in the network, such as compression, to support a change in flow patterns – with gas being moved upstream. It was accepted that, currently, it would be appropriate for any such investment to be funded by those benefiting from the change, and hence that a deep connections policy remains appropriate at the present time and is not an undue barrier to entry. It was also noted that a parallel UNC (Uniform Network Code) Modification had been proposed that would introduce a new transportation charge / credit, designed to take account of the network benefits from distributed gas connections, and any additional operating costs associated with the new connection.

Concerns were raised that it could be a barrier to entry if the GDNs were to be responsible for providing all aspects of the entry facility. EMIB considered that, as a general principle, market provision should be relied upon as far as practical. It was therefore felt that a minimum connection policy should be applied. This would involve the GDN undertaking the minimum level of investment needed in order to be able to comply with its obligations. In practice, the expected minimum connection would consist of suitable telemetry plus a remotely operable valve that would allow compliant gas to enter the GDN, but leave the GDN with an ability to physically isolate the entry point and exclude gas if compliance was not maintained. The GDNs may choose to compete to provide other aspects of the entry facility, but the connectee would be responsible for determining its preferred provider.

EMIB recognised that, in order to meet their obligations, the GDNs would wish to specify the requirements that any equipment installed at an entry point would be required to meet. To support this, the GDNs have developed a Functional Specification that sets out the requirements to be met at any entry point that is to be connected to a GDN. The intention is that this Functional Specification may need to be built on to include any specific requirements at a particular entry point, but would be a generic specification that would be referenced in all relevant Network Entry Agreements and be adopted by all GDNs in order to deliver a consistent approach. The proposed Functional Specification is attached (Appendix 3). This consistency was recognised as central to avoiding barriers to entry through uncertainty as well as by supporting competitive procurement, and consequently providing confidence about the level of costs incurred which would be subject to normal competitive pressures. It is recommended that, initially, this Functional Specification be maintained by the GDNs. In the future, following practical experience with its application to biomethane projects, the Functional Specification should be

adopted and maintained by IGEM (Institute of Gas Engineers and Managers).

While there was general agreement that the bulk of any entry facility could be owned and managed by the connectee, the process for adding odorant raised specific concerns. The GDNs can face cost increases if gas is over-odorised (since this is expected to lead to an increase in the number of public reported escapes). While any failure to odorise the gas can clearly create significant safety concerns, with leaks potentially being undetected, the impact of over-odorisation also raises safety concerns since an increase in the number of reported escapes can divert resources to low risk incidents and consequently have the potential for a delay in dealing with higher risk incidents. National Grid, Scotia Gas Networks and Wales & West Utilities accepted that this risk could be managed contractually, such that odorisation would be treated no differently to other aspects. However, Northern Gas Networks wish to retain responsibility for the addition of odor in all cases.

As noted above, the group agreed that, currently, it is appropriate for a deep connections approach to continue to apply to biomethane inputs in relation to the initial investment in entry facilities and network enhancement (if applicable). However, it has also been recognised that there are potentially additional network costs and benefits associated with distributed gas connections, compared with gas supplied to Local Distribution Zones (LDZs) from the National Transmission System (NTS). A new system entry charge/credit to reflect these costs and benefits has been developed by a UNC Workgroup (UNC391), meeting in parallel with EMIB, which has recommended the introduction of such a charge/credit. The proposals for a suitable charge will go to the UNC Modification Panel and wider consultation and, if agreed, are likely to be introduced sometime in 2013.

The proposal is to introduce a new LDZ system entry commodity charge that would reflect:

- The additional forecast operating costs of the GDN-owned entry facility and those of any deep network assets directly related to the new entry flow;
- The deemed saving in the cost of booked NTS exit capacity for the DN, due to the forecast availability of gas flows at the new entry point leading to deemed lower levels of booked NTS entry capacity than otherwise; and
- The notional typical reduced usage of the LDZ system tiers by gas from the new entry point relative to gas from NTS offtakes into the LDZ system.

The proposed LDZ system entry commodity charge would be specific to each new entry point, and could be positive or negative depending on the relative magnitude of the factors outlined above. Following initial determination, the unit rate for future years would normally be determined by applying an RPI inflation factor (although redetermination from underlying costs and benefits could be carried out in the event that forecasts costs / flows were to change substantially).

Network capacity availability

Consider treatment of capacity for biomethane entry to GDN networks and consider areas for reform.

The group considered that a simple approach is desirable in order to minimize costs and avoid unnecessary barriers to entry. It was therefore recommended that entry capacity rights should be set out in the Network Entry Agreement (NEA) for the relevant entry point. Given that the requirement is generally for a steady flow at all times throughout a year, it was accepted that the maximum capability that could be offered will be equal to the minimum demand downstream of the entry point. It was envisaged that this should be sufficient to accommodate the majority of potential entrants, and that there was little alternative since gas can only enter the network if there is sufficient demand for that gas to be used. EMIB therefore supported capacity being made available up to the minimum demand level.

In addition, it was accepted that the GDNs should offer interruptible entry capacity. This is likely to be of value in cases where it enables a producer to deliver gas to the grid at most times, while being constrained off at times of particularly low demand – some producers may find this preferable to the cost of investment in light of an assessment of those cost and the probability of interruption.

The group recognised that changes in demand can occur over time. In these circumstances, it was recognised that it would not seem equitable for the entry agreement to be revisited and the amount of capacity available for entry to be reduced to the new minimum diversified demand – allowing this as a possibility would introduce uncertainty and be a barrier to entry. It was therefore felt that any necessary investment to allow continued entry should be treated in the same way as other network reinforcement. The group recommends that Ofgem confirm that they would expect any such investment to be regarded in the same way as other economically and efficiently incurred network investment.

An ENA position paper providing further information on capacity issues is attached at Appendix 4.

Technical standards for calorific value (CV)

Consider the implication for biogas injection in the context of the existing standards for biomethane CV measurement, and the associated governance regime.

Dave Lander Consulting undertook some analysis to address this issue. The full report, summarised below, is attached at Appendix 5. The analysis supports a view that, for all credible flows of biomethane into gas distribution systems, there would be no expectation of customers being unduly impacted if CV determination devices with a maximum permissible error of +/-0.5 MJ/m3 were considered acceptable. This would create the prospect of competitive development and provision of these devices, with consequential benefits for all parties. The group therefore recommended that all necessary steps should be undertaken to authorise devices that could demonstrate that they are capable of operating within this range. To provide confidence about how authorisation can be obtained, the group recommend establishment of a common specification covering accuracy, performance and functionality, plus the establishment of a common accreditation body to assess the compliance of any specific device at the request of any party. A potential governance model which Ofgem are invited to consider in this context has been provided [somewhere …..].

BACKGROUND

Estimates of the accuracy of domestic consumer billing have been made. The approach used is based on the principles given in a guidance note produced by Marcogaz and is based on estimates of sources of bias and uncertainty in bias of each of the steps used to derive consumers' energy bills. Such sources include measurement equipment (notably the domestic meter, NTS offtake meters and NTS offtake CV determination devices), assumptions behind the fixed factors used for volume conversion required by the Gas (Calculation of Thermal Energy) Regulations, and the variation in CV experienced by consumers in a particular charging area.

Having made estimates of consumer billing accuracy, the impact of reducing the accuracy CV determination for entry of small volumes of gas is estimated. The principal driver for reducing the accuracy of CV determination is to reduce obstacles to uptake of use of renewable gas supplies such as biomethane, but the approach is applicable to entry of small volumes of any gas.

CONCLUSIONS

1) For a typical LDZ, where uncertainty in bias in NTS offtake metering and CV determination are around ±4% and ±0.1 MJ/m3 respectively, the bias in domestic energy metering is estimated to be: -0.445% ±7.42%. The dominant sources of bias and uncertainty in bias are associated with fixed factors for conversion of actual domestic metered volume to reference temperature and pressure.
2) For a typical LDZ, the bias in LDZ energy is estimated to be: 0% ±2.04%. The bias in LDZ energy resulting from the LDZ model is zero because the model assumes that daily volumes and daily CVs are unbiased.
3) Current custom and practice is for CV determination equipment to meet a requirement that (absolute) error in CV should not exceed 0.10 MJ/m^3. This requirement results in insignificant impact on domestic energy metering.
4) Some relaxation in Maximum Permissible Error (MPE) in CV determination may be appropriate, particularly in low volume applications, such as biomethane injection, for which the anticipated daily volumes are so low as to make CV determination accuracy insignificant in respect of impact on the domestic consumer. The appropriate MPE should be decided by consideration of other regulatory issues (such as monitoring of compliance with the GS(M)R if shared duty is being practiced), or normal commercial factors for sale of energy. However, daily flows of up to 2.5 million m^3 could be measured with devices having an MPE of 0.5 MJ/m^3 with no material impact on accuracy of FWACV and hence domestic consumer energy billing.
5) In addition to MPE, a formal performance specification for CV determination devices should include a maximum bias shown by CV determination devices with gases that the instrument (or family of instruments) is likely to see.

Gas quality regulation

Develop an understanding of the current requirements and whether they remain fit for purpose for the injection of biogas.

To establish a consistent approach to gas quality regulation, with proportionate requirements, the existing requirements were reviewed and the Functional Specification (see Appendix 3) captures what the group regards as a fit for purpose regime that should be incorporated in individual NEAs. This specification will initially be maintained by the GDNs, but the group recommends that this becomes an IGEM standard in future. The proposed standards were informed by a generic risk assessment.

It is recommended that at any specific entry point, the biomethane producer and GDN should participate in a measurement risk assessment to determine which gas quality parameters should be monitored, the frequency of measurement and the speed of response of measurement system. The recommended limit values should also be assessed by risk assessment.

The initial risk assessment should set out those changes that will require review under the risk assessment. In the event of one or more such changes, the risk assessment should be reviewed. Where a particular parameter shows increased risk, then a change in the monitoring scheme may be appropriate.

While accepting that all current safety standards should apply, a question was raised over the costs and benefits of achieving the existing standard for oxygen content. Recognising that this is not a safety issue, Wales & West Utilities is conducting a study into corrosion in order to establish whether it will be acceptable to change the oxygen limits in gas specifications. It is recommended that the requirement in GS(M)R Schedule 3 for pipeline gas to contain less than 0.2% oxygen should be reviewed following the conclusion of the current study into the possible effects on pipeline corrosion of elevated oxygen levels. If the study demonstrates no material increase in corrosion rates with oxygen levels of up to 1%, the HSE should recommend relaxation of the oxygen limit in GS(M)R up to this level. This relaxation is critical to the development of biomethane being brought to the grid since removal of oxygen is not considered to be economic in many circumstances identified to date.

Dewpoint was also addressed in a paper produced by Dave Lander Consulting (see Appendix 6). In light of this analysis, it is recommended that the water dew temperature specification in respect of gas distribution systems should be relaxed from that which currently applies, which is appropriate to NTS pressures and is unduly stringent and costly to achieve for biomethane and other distributed gas inputs. The proposed specification is water dew temperature to be no greater than -10^{o}C:

- at 7 barg for injection into below a 7 barg distribution systems; or
- at the maximum anticipated pressure for injection onto an above 7 barg (7-16 barg) distribution system.

The group also noted that there is a potential requirement for biomethane producers to hold a Gas Transporter Licence. The activities that must be authorised by a gas transporter licence are set out in section 5 of the Gas Act, and include the following activity: “the arrangement with a gas transporter for gas to be introduced into, conveyed by means of, or taken out of, a pipeline system operated by that transporter.” This includes biomethane (and other gas) inputs into the gas distribution networks, leading to the potentially onerous requirement for biomethane producers (and other distributed gas producers) to hold a gas transporter licence.

However, the Gas Act provides the Secretary of State (for the Department of Energy and Climate Change) with the power to grant an exemption in respect of this activity (and other activities). The purpose of the exemptions is to reduce the regulatory burden for those people for whom holding a licence would be excessive, or onerous. This includes people whose business requirements involve the operation of a pipeline that is not truly part of the gas network, for instance a terminal operator operating a pipeline that connects the terminal with the National Transmission System (NTS). The exemptions associated with the NTS terminals are “Named Exemptions”, in other words, they relate to specific geographical locations. By analogy, it would be appropriate for producers operating delivery facilities that connect into the gas distribution networks to benefit from exemptions from the requirement to hold a gas transporter licence. However, as large numbers of such distribution network-connected delivery facilities are expected, it will be impracticable to operate a Named Exemptions regime. Therefore it would be desirable if a Class Exemption covering all distribution network-connected delivery facilities could be put in place, similar to the Class Exemptions that currently exist for conveying gas to/from a storage facility. To remove this potential barrier to entry, it is recommended that DECC arrange for a Class Exemption from the Gas Transporter Licence to be put in place in respect of all delivery facilities connected to gas distribution networks.

Data requirements and transmission

The current industry processes for transmitting flow / calorific value were designed for large offtakes. The group should consider potential alternatives for transmitting data for the purposes of settlement.

The existing approach was clarified and has been captured in the Functional Specification. This involves the capture of considerable quantities of data and its transfer into GDN computer systems. This is designed to deliver compliance with the Gas (Calculation of Thermal Energy) Regulations. However, these Regulations were written on the basis that only GDNs own and operate CV measurement equipment. As such, it is not clear that the Regulations would apply to Biomethane producers under the approach envisaged by EMIB, whereby the producer owns and operates the CV measurement equipment. At an EMIB meeting, Ofgem had indicated that they would envisage biomethane entry points being "directed" sites in that letters of direction would be issued in accordance with the Regulations. Given the potential uncertainty about the applicability of the Regulations and Ofgem's consequent ability to issue letters of direction in respect of biomethane sites, the EMIB Chair wrote to Ofgem, on behalf of EMIB, to invite them to consider whether they would wish to promote an early change to the Regulations, and so provide increased certainty for the industry. A copy of this letter has been included as Appendix 7.

Given the lack of clarity regarding the applicability of the Regulations, the group recommends that Ofgem and GDN lawyers seek to agree how the Regulations are to be applied in the context of biomethane entry. Dependent on the conclusions and recommended way forward developed as a result of this legal interpretation of the Regulation, and in view of the earlier EMIB recommendation that entry facilities (including CV measuring equipment) should be provided as a competitive service, the group recommends that DECC consider amending the Gas (Calculation of Thermal Energy) Regulations to recognise non-GDN ownership of CV measurement equipment that is subject to Directions by Ofgem

If the regulations are amended to apply to the proposed biomethane entry arrangements, the amendment should include a reduction in the data requirements.

While believing that there is a case for the Regulations applying to biomethane sites, the group did not consider that the full range of information provision is appropriate. The present application of the Regulations may be regarded as over-specifying the amount of data that needs to be transferred to the GDNs' systems, such that the hardware/software required can, in practice, only be provided by one supplier and is arguably more expensive than necessary to protect customer interests. Estimates from potential suppliers have indicated that, compared to a specification that provides core data on a daily basis in a standard format, the current requirements may add as much as 20% to the cost of an entry facility. This is a substantial cost for which no clear benefit has been identified, and hence it is recommended that proportionate requirements are implemented as part of any change to the Regulations, recognising the low risk imposed by relatively small biomethane sites operating with an obligation to supply gas in line with the flow weighted average CV. Further detail is provided in Appendix 7.

The group therefore recommends that, if the regulations are amended to apply to the proposed biomethane entry arrangements, the amendment should include a reduction in the data requirements. Pending any change to the Regulations, the Functional Specification and NEAs should include requirements that protect consumers appropriately, reducing the need for transfer and storage of large amounts of data from the biomethane facility to the GDN systems on within day CV values and

validation of instrument health, which causes unnecessary costs and prevents competition in the provision of data transfer facilities.

Appendix 1: Terms of Reference

Purpose

To provide a forum for informed debate on the potential barriers to the commercial development of biomethane projects within the energy market and the appropriate means of addressing such barriers, including but not limited to the following areas:

GDN connection policies - understand how the exiting connection policy operates and establish whether this introduces any barriers or uncertainty to facilitating connections to the grid.

Network capacity availability - Consider treatment of capacity for biomethane entry to GDN networks and consider areas for reform.

Technical standards for calorific value (CV) - Consider the implication for biogas injection in the context of the existing standards for biomethane CV measurement, and the associated governance regime.

Gas quality regulation - Develop an understanding of the current requirements and whether they remain fit for purpose for the injection of biogas.

Data requirements and transmission - The current industry processes for transmitting flow / calorific value were designed for large offtakes. The group should consider potential alternatives for transmitting data for the purposes of settlement.

Membership

By invitation. To include a range of stakeholders with an interest in biomethane injection issues and expertise or views which are directly relevant to the purpose of the group.

Meetings

Monthly or less – with the option of sub-groups being formed. Agendas, presentations and minutes will be published on the Joint Office of Gas Transporters website.

Secretariat

The Secretariat will be provided by the Joint Office of Gas Transporters.

Deliverables

The work of the group will be summarised in a report and published on the Joint Office of Gas Transporters website.

Appendix 2: Meeting Attendees

EMIB Meetings

Adam Baisley	Agri Energy
Alex Ross	Northern Gas Networks
Andrew Grigsby	Arup
Andrew Moore	Northumbrian Water
Chris Bielby	Scotia Gas Networks
Chris Phillips	CRS BIO
Dave Lander	Dave Lander Consulting
David Pickering	National Grid
Gareth Mills	Northern Gas Networks
Ian Gardner	Arup
James Lewis	Calor Gas Ltd
Joanna Ferguson	Northern Gas Networks
John Baldwin	CNG Services / REA
John Cornes	Atlas Copco
John Williams	Poyry
Jonah Anthony	DECC
Lesley Ferrando	Ofgem
Mark Bugler	British Gas
Matt Hindle	ADBA
Mike Berrisford (Secretary)	Joint Office of Gas Transporters
Pat Howe	SSE
Paul Holland	EffecTech
Peter Hardy	IGEM
Richard Fairholme	E.ON UK
Richard Lewis	Arup
Richard Pomroy	Wales & West Utilities
Richard Street	Corona Energy
Roger Warren	Enzen Global
Stephen Skipp	Scotia Gas Networks
Steve Rowe	Ofgem
Steven Sherwood	Scotia Gas Networks
Stuart Bennett	Heat and Power Services
Stuart Gibbons	National Grid Distribution
Tim Davis (Chair)	Joint Office of Gas Transporters
Tim Slaven	AMEC

Expert Group

Bob Fletcher (Secretary)	Joint Office of Gas Transporters
Brian Durber	EON UK
Chris Bielby	Scotia Gas Networks
Colin Stock	Wales & West Utilities
Dan Anderson	National Grid
Dave Lander	Dave Lander Consulting
David Pickering	National Grid
Helen Cuin (Secretary)	Joint Office of Gas Transporters

Iain Ward	REA/CNG Services
Ian Taylor	Northern Gas Networks
James Clarke	Skanska Utilities
Joanne Parker	Scotia Gas Networks
John Baldwin	CNG Services / REA
John Edwards	Wales & West Utilities
Jonathan Wisdom	RWE npower
Lesley Ferrando	Ofgem
Mike Berrisford (Secretary)	Joint Office of Gas Transporters
Olu Ajayi-Oyahire	IGEM
Paul Holland	EffecTech
Peter Hardy	IGEM
Richard Lewis	Arup
Richard Pomroy	Wales & West Utilities
Steve Armstrong	National Grid Distribution
Stephen Skipp	Scotia Gas Networks
Steve Howells	Scotia Gas Networks
Steve Rowe	Ofgem
Steven Sherwood	Scotia Gas Networks
Stuart Gibbons	National Grid Distribution
Tim Davis (Chair)	Joint Office of Gas Transporters
Will Guest	Northern Gas Networks

Appendix 3: Requirements for Integrated Biomethane to Grid Injection Facility Functional Specification

Published as separate file alongside this Report

Appendix 4: ENA Capacity Position Paper

Capacity for distributed gas entry

Gas Act obligation
Gas Act section 9 obliges transporters to develop an economic and efficient system.
Standard Special Condition D12 3b requires the DN to offer the maximum flow rate that is ava
from time to time.

Current method of capacity analysis
The DNs will analyse capacity using the following principles.

Analyse available capacity on day of minimum demand using network analysis models assum
appropriate proportion of peak day flow for that network and pressure tier. We would use moc
the period up to the end of the next Forecast Year 1. A check will be performed to ensure that
capacity is not reliant on a few large loads. Relying on large loads is not a tenable strategy as
can be no guarantee that the demand will always match the supply for example due to short t
long term plant shutdowns.

- Where there is sufficient capacity the available capacity will be offered
- Where there is insufficient capacity to meet the entrant's request, the entrant may ask
  to consider other measures to provide the requested capacity. The entrant would ne
  pay for the feasibility study to determine what options are available and any measur
  taken to provide capacity which would be chargeable to the connecting party

Methods of providing increased network capacity
Networks can provide increased entry capacity by the following methods which may not be av
in all circumstances.

- Changing current network dynamics
- Linking two networks
- Within network compression

Changing current network dynamics
This allows the distributed gas injection to be the "lead" and to back out the gas from the NTS.
are cost implications for on going analysis, control centres and operations. This solution may
detrimentally affect pressures at times of high demand.

Linking two networks
In this case two adjacent networks could be linked to provide a larger network to take the avail
gas. Each case would need to be examined on a case by case basis and there is likely to be

Within network compression
This might be possible in the future if the within-network compression IFI project produces pos
results. A compressor would be installed to pump gas up to a higher pressure level at times o
demand on the network to which the distributed gas source is connected.

Changes in available entry capacity after the connection is made
If the exit demand on the local network to which the entrant is connected reduces at some poi
the future then in some cases the entrant may not be able to inject gas. If it is possible to rein
the network to allow the entrant to continue to inject gas then either

- The entrant pays for the reinforcement
- The reinforcement is treated as general reinforcement

Entrant pays for the reinforcement
In this case the entrant takes on an open ended liability to pay for reinforcement for the life of t
plant. This would be inconsistent with the approach taken for Exit demands where a gradual ir
in demand leads to general reinforcement. If this approach is adopted it seems likely that the r
of distributed gas schemes implemented will reduce as only those where there is plenty of cap
will be viable. This solution is likely to become complex if two or more entrants share inject ga
the same network.

The reinforcement is treated as general reinforcement
This seems to be the only realistic option. This would be consistent with the treatment of exit.

Proposal
Following the successful connection of a distributed gas connection any future reinforcement of the Network to provide the contracted capacity should be treated as general reinforcement and included within the DN's RAV.

General reinforcement to support entry would be defined as reinforcement caused by changes in exit demand that means that there is no longer sufficient entry capacity available to enable gas entrants to continue to inject gas at the rate agreed at the time of connection and for which there was sufficient entry capacity at the time of connection over the DN'sTs planning horizon (up to the end of Forecast Year 1).

Joint Office of Gas Transporters

Appendix 5: Accuracy Of CV Determination Systems For Calculation Of FWACV

Published as separate file alongside this Report

Appendix 6: Specification Of Water Dew Temperature Of Biomethane Injected Into Gas Distribution Systems

Published as separate file alongside this Report

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Appendix 7: Gas (Calculation of Thermal Energy) Regulations

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Telephone: 0121 623 2115

E mail:
enquiries@gasgovernance.co.uk

24 Hour gas escape number 0800 111 999*

* Calls will be recorded and may be monitored

20 April 2012

Dear Steve,

Recommendations from EMIB Expert Group relating to Gas (Calculation of Thermal Energy) Regulations and data transfer requirements for small entry flows

We had a useful discussion at the EMIB Expert Group on 16th April relating to the energy measurement and data transfer requirements for small entry flows which are driven by the requirements of the G(COTE) Regulations and the Ofgem Letters of Direction / Letters of Approval. As a result of the discussion we agreed it would be very helpful if you could initiate a number of actions; some relating to recommendations for changes to the Regulations themselves (which we recognise would need to be considered / sponsored by DECC and would take some time to implement), and some relating to Letters of Direction / Approval which would be within Ofgem's power (possibly following consultation) to implement in a shorter timescale.

We believe there needs to be urgent action on the following high level points:

- As the Regulations apply only to Gas Transporters, if Ofgem intends that CV measurement at system entry should continue to be subject to Directions this is not compatible with third party ownership of equipment. It would not make economic sense to install two assemblies of CV measuring equipment, but as this equipment makes up a large proportion of the grid injection facilities it would effectively limit ownership of such facilities to GTs, which was not the intention of EMIB. Therefore the Regulations need to be changed,

- The current requirements in the Regulations and Letters of Direction / Approval imply the need for transfer and storage of large amounts of data from the site to the GT's systems on within day CV values and validation of instrument health, which causes unnecessary costs and prevents competition in the provision of data transfer facilities. These requirements should be changed to reduce costs and allow competition.

In relation to costs / competition, preliminary enquiries have indicated that if some of the current required functionality could be relaxed in the case of small entry flows of less than say 250,000 m3 / day, this could lead to cost savings of between £25 – 50k per installation (up to 20% of the costs of the equipment), thereby reducing barriers to entry to biomethane and other sources of distributed gas.

The detailed recommendations are as follows:

Gas (Calculation of Thermal Energy) Regulations 1996 (and the 1997 Amendments)

1. Currently there is a requirement in Regulation 6(c) for **the gas transporter** to "provide and maintain such … apparatus and equipment for the purpose of making such determinations as the Director may direct". We believe that this requirement is potentially at odds with the agreement at EMIB by the Gas Distribution Networks that third parties such as biomethane producers should be allowed to own and operate energy measurement equipment at system entry. We considered whether "provide and maintain" could be construed to mean "procure others to provide and maintain", but were concerned that this was at best open to legal challenge.

   The assumption that it is the gas transporter that is always responsible for measurement and calculation of CV runs throughout the Regulations (see, e.g. 4(3) and 4A(7)), and our view was that the Regulations should recognise a distinction between the responsibility for site measurement of CV at an input point (which in future could be the responsibility of a biomethane producer) and the responsibility of calculating the flow weighted average CV (which would stay with the GT)

   Therefore we would be grateful if you would raise the profile of this issue with DECC. The options for solving the problem appear to be:
   a. Do nothing: this would not support the EMIB agreement on third party ownership of grid injection equipment, as volume and CV measurement form a large part of such equipment
   b. Obtain a legal opinion that "provide and maintain" may be interpreted as "procure the provision and maintenance of" in relation to energy measurement equipment: this would support third party ownership, but might not provide sufficient certainty for project developers against the risk of potential future regulatory action
   c. Change the Regulations to accommodate third party ownership of energy measurement equipment: **this is the recommended option**, but the EMIB group recognised that it was not a short-term solution
   d. In the short term obtain an exemption from the Regulations from DECC to allow third party ownership: this could be an interim solution in the period leading up to a change in the Regulations.

2. There is a requirement in the Regulations for a gas transporter (which would need to be amended to owner of the equipment in the light of the above) to carry out tests on CV measurement equipment at least every 35 days and to notify the results of such tests to the Director within 7 days of the end of the calendar month in which the tests were completed (Regulation 6(e) and (f)). We proposed that the requirement to notify the results of **all** tests to Ofgem was unduly onerous, and that, whilst their should continue to be a requirement for tests to be carried out, **it should be sufficient to report within 7 days only those incidences where the equipment was outside its permitted tolerance** (which, if other EMIB recommendations are accepted, would be

+/-0.5 MJ/m3).

Finally in relation to Regulation 6 we noted that the requirements in (d) and (g) to make available for inspection by the public and by licence holders (shippers) the results of CV determinations or tests was redundant and pure "red tape", as, to our knowledge, the opportunity for inspection of these results has never been exercised. Therefore **these provisions should be recommended for removal and replaced by an obligation on the equipment owner to store the data (on site) for a particular time and make it available on request.**

The same comment applies in relation to Regulation 5(a) and (c), and Regulation 13, where the requirements for the GT to make CV / testing data available for inspection, or to send calculations of daily CVs to owners / occupiers has never, to our knowledge, been invoked. **These provisions of the Regulations could also usefully be removed and replaced by a similar obligation for on site data storage / retrieval.**

The above recommendations for changes to the Regulations, if implemented, would have the effect of reducing the requirement for data items to be communicated back from individual sites into the computer systems of the GTs thus simplifying the data transfer process with an associated benefit in terms of cost reduction. The intention would be that, rather than communicating vast amounts of (largely irrelevant) CV-related data to the computer systems of the GT and storing such data centrally, it would instead be held securely in the equipment at the site, and would be available for retrieval by the owner of the equipment (biomethane producer or GT as applicable) in the (unlikely) event that it was required for inspection. In this regard, any requirements in the regulations for communication of data to Ofgem (or any other non-GT party) should apply to the owner of the equipment rather than to the GT.

Letters of Direction / Approval

1. Current Letters of Direction require that the average calorific value for each gas day shall be determined by aggregating the values of discrete measurements of calorific value of the gas at regular intervals, not exceeding one hour, during the gas day. The averaging is currently carried out by the end of day averaging software. Uploading of individual CV/flow data is currently carried out to permit re-constitution of data in the case of metering errors and to permit details of how daily average CV was calculated.

   We agreed that, at least in relation to small gas inputs of less than say 250,000 m3 / day, daily average CV and daily volume should continue to be calculated at site and this minimum dataset should be sent back to the GT (plus a flag indicating validity of the CV. Data transmission would continue to use the existing CSV format, so whilst the process would be simplified in terms of data volumes there would be no need for changes in the existing systems. The existing requirements for the calculation of average CV to exclude CV values which are invalid / associated with zero flow would remain, but the records of excluded values would be stored locally rather than delivered into the GT's systems.

2. We had a lengthy discussion on how the current requirement in Regulations 4(3) and 4A(7) to use alternative CV determination methods in cases where the "apparatus … fails to determines accurately, or at all, calorific values for a continuous period exceeding eight hours in any gas day…" might be met, where such measurements were

not being continuously loaded into the GT's systems. We came to the conclusion that as it would not be possible for a third party equipment owner to rely on calculated values of CV to be provided by the GT (this is an offline process within NG Transmission) the only alternative appeared to be for **arrangements to be put in place to shut off the flow of gas if it appeared likely that the eight hour inaccuracy criterion might be breached.** For example, the DFO could be required to shut off after [seven] hours, with the backstop of the GT having the right to operate the ROV before the eight hour condition came into play.

3. We also noted that some of the requirements in the current Letters of Direction / Approval relate closely to the existing approved instrument (the Danalyser); e.g. the demonstration that the calibration gas employed is suitable during the 35 day test. It is possible that a different instrument may not have such requirements (or might have different ones) and so would need to be developed at the time of approval of the instrument. For this reason it is difficult to fully specify which data and files are required for upload to HPMIS to an agreed format until an alternative instrument is approved. **However, if it were possible to store much of the data locally and to upload only end of day volumes and CVs into the GT's systems, then much of this data transfer complexity could be avoided.**

Information security issue

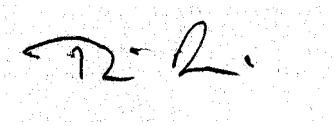
You should also be aware of a further issue in relation to security aspects of data transfer. National Grid's IS department has identified a possible IT security risk issue in relation to data transfer from third-party owned equipment into GDN's SCADA by means of the current ethernet connectivity and HPMIS systems by means of the current RemoteWare server / ISDN connectivity. NG IS has recognised that the IP connectivity between the systems could provide unauthorised access to the GDN's Critical National Infrastructure (Distribution Network Control Centre systems) and to the GDN's business networks, and so it is essential to develop a solution for business to business data transfer that mitigates this risk. NG IS is currently scoping out possible solutions to this problem, but developing an alternative to the current continuous data transfer link into HPMIS (e.g. transfer of end of day readings only) could be helpful in this regard.

In conclusion, we would appreciate your support in relation to the proposals outlined above. In particular we invite you to progress these issues with DECC where appropriate, and to consider changes to letters of Direction / Approval to accommodate simplification of CV measurement for small input flows, with consequential benefits in relation to costs and competition in provision.

We note that there are two biomethane projects currently being built on the pre EMIB basis of the GDN providing entry facilities (with some IFI funding). However, a number of projects are aiming for approval in the next six months, for completion by summer 2013, and they have been progressing on the basis of the biomethane producer providing the entry facilities. Hence this gives a degree of urgency to addressing the G(COTE) point.

Please give these matters your urgent consideration; we would we would appreciate your feedback prior to finalising the recommendations for inclusion in the final EMIB report.

Yours sincerely



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On Behalf of EMIB Expert Group