



Network Code on Interoperability and Data Exchange Rules for European Gas Transmission Networks

Supporting Document for Public Consultation draft Network Code

This document is deemed to be a supporting document for public consultation (hereinafter referred to as the 'Supporting Document') which accompanies a draft network code on Interoperability and Data Exchange Rules (INT0352-130227) developed by ENTSOG (hereinafter referred to as the 'Regulation'). This Supporting Document was developed for the purpose of the public consultation (hereinafter referred to as the 'Public Consultation') to be conducted during the preparation of all network codes developed pursuant to Article 10 of the Regulation (EC) No 715/2009¹ and Article 28 of ENTSOG's Rules of Procedure².

The Regulation was developed following an invitation letter of the European Commission (hereinafter referred to as the 'Commission') to draft a network code on interoperability and data exchange rules which was received by ENTSOG on 11 September 2012 (hereinafter referred to as the 'Invitation Letter').

The development of this Regulation is based upon the framework guidelines on interoperability and data exchange rules (hereinafter referred to as the 'Framework Guidelines') published on 26 July 2012 by the Agency for the Cooperation of Energy Regulators (hereinafter referred to as 'ACER') and upon the Invitation Letter.

This Regulation was developed from ENTSOG's Interoperability and Data Exchange Rules Launch Documentation, which was published on 9 October 2012 (INT0276-120611), and inputs from ENTSOG's members gathered through its Interoperability Working Group and from external stakeholders via the Stakeholders' Joint Working Sessions (SJWSs) held in November and December 2012. The materials from the SJWSs are available on ENTSOG's website: <http://www.entsog.eu/publications/interoperability>.

For the avoidance of doubt, the Supporting Document shall not be construed as part of the Regulation. Therefore, it is not deemed to be binding and is publicly disclosed to the market for information and consultation purposes only and without any commitment whatsoever from ENTSOG as to the final content of the Regulation.

Any and all interested parties, in their capacity as professional stakeholders, shall be responsible for seeking to obtain the accurate and relevant information needed for their own assessment and decision to respond to the consultation.

ENTSOG hereby disclaim all responsibility for any changes that will occur to the Regulation. Such changes may result from amongst others the results of the consultation or comitology procedure.

¹ Regulation (EC) No 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005, *Official Journal*, L211/36, 14 .08.2009.

² <http://www.entsog.eu/publications/statutes>

The content of Supporting Document should not be considered to give rise to any specific right or obligation whatsoever to ENTSOG or any of its members as to any stakeholders.

ENTSOG has sought to produce a Supporting Document which is both useful and relevant for parties which have an interest in the Public Consultation.

ENTSOG would like to thank those market participants who have contributed to date to the development of the Regulation. We hope that the publication of the Regulation, together with the Supporting Document, will prove a valuable step towards a workable, agreed set of rules that will significantly improve the functioning of the market.

A. Introduction

The Invitation Letter of the Commission clearly stated that the Regulation should cover the following areas: Interconnection Agreement, Units, Gas Quality (aspects not directly dealt with in the context of CEN mandate M/400), Odourisation and Data Exchange.

As to capacity calculation, it will not be included in this Regulation. Indeed it has already been addressed in the network code on capacity allocation mechanisms³ (hereinafter referred to as the 'CAM regulation') and it also is closely related to the Guidelines on Congestion Management Procedures⁴ (hereinafter referred to as the 'CMP Guideline'). Therefore the Commission considered it beneficial to explode the issue of capacity calculation by supplementing the relevant section of CAM regulation along the lines of the Framework Guidelines. In this respect the Commission is making use of its right of proposal to put forward a text for comitology.

The Regulation and the Supporting Document focus on the following issues:

- > General Provisions (Subject matter, Scope, Definitions)
- > Interconnection Agreements
- > Units
- > Gas Quality
- > Odourisation
- > Data Exchange
- > Dispute Resolution
- > Final Provisions (Implementation, Entry into force)

³ The text of the CAM network code is currently under comitology procedure

⁴ Annex 1 point 2 of the Regulation amended by the Commission Decision of 24 October 2012

For each of these issues the following information will be described in the Supporting Document:

- > Framework Guideline
- > Policy options and analysis of decisions
- > Questions for Public Consultation

ENTSOG welcomes responses to this Public Consultation on the Regulation and will take due consideration of all views submitted.

B. How to respond to this Public Consultation

ENTSOG welcomes all comments on the Regulation replying, in particular, to the specific questions raised throughout the Supporting Document.

Please use the on-line Consultation Response Form through www.surveymonkey.com/s/ENTSOG_DRAFT_INTNC_PUBLIC_CONSULTATION. Please submit your on-line response by 17:00 UTC on 26 April 2013.

To enable ENTSOG to consider responses as fully as possible, we would be grateful if respondents could:

- > consider fully this document, the Regulation (INT0352-130227) and the materials from the stakeholder joint working sessions;
- > provide responses that are as focused and succinct as possible;
- > provide full reasoning and supporting quantitative and/or qualitative evidence (where available) for responses; and
- > copy the original text of the Regulation and indicate/describe relevant changes.

If you wish any part of your response submission to be treated as confidential, please mark the relevant sections of your document clearly. Please note, however, that ENTSOG's approach to developing the Regulation relies heavily on transparent exchange of views across market participants. Therefore, we would encourage you to allow your full response to be made public, unless it is not possible due to the inclusion of commercially or otherwise sensitive information.

Any questions regarding the Regulation or the Supporting Document can be sent to interoperability@entsog.eu. Respondents also will have the opportunity to seek clarification on these documents at a consultation workshop to be held in Brussels on 20 March 2013. Initial views from respondents could also be expressed at that workshop and will also be taken into consideration in the further development process of the Regulation.

After the closure of this Public Consultation on 26 April 2013, ENTSOG will host an additional stakeholder workshop on 28 May 2013 where a summary of consultation responses received will be presented and where stakeholders will be able to express their final positions on key elements of the Regulation.

C. Procedural background and prior consultation with stakeholders

Organisation and timing

The Regulation and the Supporting Document have been prepared by ENTSOG, an organisation currently comprising 41 Members, 3 Associated Partners from 25 European countries and 4 Observers from EU-affiliate countries, in line with its tasks under Article 6 of the Regulation (EC) No. 715/2009.

Pursuant to the Invitation Letter, ENTSOG shall deliver the Regulation to ACER by 11 September 2013.

Consultation and expertise

In line with its internal process and in compliance with Regulation (EC) No. 715/2009, ENTSOG has been extensively engaged with market participants and participated in events in order to publicise the process and encourage stakeholder involvement.

ENTSOG has also invited third countries' transmission system operators to take part in the development process of the Regulation. In cooperation with Energy Community ENTSOG will organize a Workshop dedicated to the exchange of views with third countries' transmission system operators on 16 April 2013.

In the project plan consultation⁵, market participants were invited to register in order to participate to the development process. Respondents to that consultation, which included producers, traders, network users and end users expressed strong support for ENTSOG's proposed process.

Throughout the development process to date, stakeholders have also expressed their appreciation of the transparency of the process and the high level of consultation within: public consultation on project plan (13 September-11 October 2012), a kick-off workshop (26 September 2012), stakeholder joint working sessions (14 November, 28 November and 11 December 2012) Prime Mover meetings (7 November, 14 November, 5 December 2012 and 24 January 2013) and other meetings with key stakeholders to discuss specific issues in relation to this Regulation.

In parallel, ENTSOG has held regular trilateral meetings with the Commission and ACER (29 October, 30 November, 14 December 2012, 24 January 2013 and 11 February 2013) in order to clarify the intent of the Framework Guidelines and the drivers and expectations behind it. This aimed at ensuring the Regulation is, as far as possible, compliant with the provisions of the Regulation (EC) No. 715/2009 and in line with the Framework Guidelines as well as technically and legally workable and supported by stakeholders.

⁵ ENTSOG, Project Plan Developing the Network Code on Interoperability, INT0161-120711, 13 September 2012.

Stakeholders' views

In accordance with the Regulation (EC) No. 715/2009 and ENTSG's statutes, stakeholders' views have been taken into consideration during the development of the Regulation as described throughout the Supporting Document when explaining the rationale for the options selected.

Planning and next steps

Responses to this Public Consultation will help to determine the final approach taken by ENTSG when formulating a revised Regulation.

Key dates for the finalisation of the Regulation can be found in the table below.

Table 1: Key dates in the process to finalise the Network Code

28 February 2013	Public consultation on the Regulation launched
20 March 2013	Consultation workshop
16 April 2013	Workshop with Energy Community's members
27 April 2013	Deadline for responses to the Public Consultation
28 May 2013	Conclusions workshop
10 July 2013	Stakeholder Support Process ⁶ starts
23 July 2013	Stakeholder Support Process ends
11 September 2013	Final Regulation submitted to ACER

The next steps regarding the Regulation are defined under the Regulation (EC) No. 715/2009.

⁶ ENTSG, Rules of Procedure, Art. 26, paragraph. 4 and Article 28, paragraphs 6 and 7 (the Stakeholder Support Process is subject to ENTSG's Board's approval).

1. General Provisions/Dispute resolution/Final Provisions

> Framework Guideline

"The Network Code developed by the European Network of Transmission System Operators for Gas (ENTSOG) on the basis of these Framework Guidelines shall apply to TSOs, with the aim to reach full market integration. LNG operators and storage operators shall facilitate interoperability and support the provisions related to TSOs laid down in these Framework Guidelines, in line with Article 15(1)(b) of the Gas Regulation.

TSOs shall cooperate with stakeholders, including distribution system operators, in developing and implementing the Network Code. European TSOs are encouraged to co-operate as much as possible with TSOs from Third Countries on interoperability issues.

The overarching objective of the Network Code is the harmonisation of rules for the operation of transmission systems in order to encourage and facilitate efficient gas trading and transport across gas transmission systems within the EU, and thereby to move towards greater internal market integration. The Network Code must be compliant with the overall objectives of the internal energy market, including security of supply, the completion of the internal gas market, and delivering benefits to the consumers. The specific objective of the Network Code is to define consistently harmonised technical, operational, communication rules and rules for business conduct that will allow the achievement of the objectives as set out in the Framework Guidelines, as well as in the Third Energy Package. Interconnection Agreements, units, gas quality and odourisation, capacity calculation and data exchange are areas where barriers to the efficient functioning of the Internal Gas Market have been identified by the Agency and for which a common approach based on harmonised rules could smooth the interoperation of the systems, including communication.

The technological underpinnings of the interoperability and data exchange rules are subject to constant change. The operational, communication and business practices follow these developments. The Framework Guidelines set out principles and requirements taking into account these potential developments. Whereas the means and format through which necessary information is communicated between TSOs and between TSOs and counterparties, shall be defined in the Network Code on Interoperability as described in the section on Data Exchange, the precise content of the same information will be determined by other network codes as well.

The Network Code shall foresee that the TSOs shall comply with its requirements within 12 months after its entry into force, unless otherwise specified in these Framework Guidelines. Such compliance includes the adaptation or completion of existing contracts and agreements.

The conduct of assessments and public consultations shall not impede the implementation of the Network Code, pursuant to the provisions of the Gas Directive, the Gas Regulation and the present Framework Guidelines.

The Network Code shall require TSOs timely to inform all concerned counterparties on the

possible consequences the implementation of the Network Code may have on their activities, to afford them time to adapt their practices.

The Network Code shall state that adjacent TSOs shall endeavour to resolve any dispute which may arise among them, while the relevant dispute settlement authorities, pursuant to Article 41(11) of the Gas Directive, shall, within their competence, act upon request of any of the TSOs, making every effort to reach a common decision on such disputes. Should the relevant dispute settlement authorities fail to reach such a common decision, the Agency shall take measures according to the provisions of Article 8 of the Agency Regulation."

> Policy options and analysis of decisions

General Provisions (Art. 1->3):

The Regulation develops rules applicable to transmission networks within EU to facilitate cross border trade. A list of definitions is included in the Regulation to clarify some terms. For the sake of consistency among the network codes to be developed by ENTSG in compliance with Article 6 of Regulation (EC) No. 715/2009, ENTSG's commitment was to align the definitions inserted in the various draft network codes as far as possible.

Dispute resolution (Art.12 and Art. 28):

Under Art. 12 of the Regulation a specific procedure for the settlement of disputes which may arise out of or in connection with the terms of any interconnection agreements is deemed as one of the mandatory terms to be included in each interconnection agreement. Such procedure shall be used to settle any dispute related to an interconnection agreement (including, but not limited to, its existence, validity, content, amendment or termination) which cannot be amicably solved between the contracting parties. As specified under the Regulation, the settlement of said disputes could be reached by designating the competent jurisdiction or, for instance, by referring to an expert (or a panel of experts) within the institutional framework or to be chosen on an *ad hoc* basis. Should the parties wish to refer to the expert(s) they shall define such procedure in the interconnection agreement, in particular by describing the way and the timing to designate the expert(s). Should the jurisdiction deem not to be competent or in case the contracting parties do not agree on designating the expert(s), the Regulation also foresees the application of the conflict-of-law as a default rule.

Under Art. 28 the Regulation foresees an overarching procedure either in case an interconnection agreement is not in force or in order to settle the disputes which may arise between adjacent transmission system operators from the implementation of the sections of the Regulation other than the 'interconnection agreement'. In particular, any disputes regarding the implementation of any other issues of the Regulation (units, gas quality, odourisation etc.) are to be solved via and in accordance with the existing dispute settlement mechanism(s) in place in the respective member states, if any. The Regulation

foresees the support of the national regulatory authorities acting as dispute settlement authorities and the involvement of the ACER in accordance with Regulation (EC) No. 713/2009.

Final Provisions (Art. 29 – 30):

Unless specifically otherwise stated, the Regulation proposes that transmission system operators should be compliant with its terms within 12 months from its entry into force. Additionally the Regulation foresees an obligation for the transmission system operators to inform in a timely manner all concerned counterparties of the possible consequences of the content of the Regulation on their activities.

> **Questions for Public Consultation**

- Do you agree with ENTSG's proposal for **General Provisions**?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree with ENTSG's proposal for **Dispute Resolution**?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree with ENTSG's proposal for **Final Provisions**?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

2. Interconnection Agreements

a. General Provisions (Art. 4)

> **Framework Guideline**

"The Network Code shall specify that the Interconnection Agreements contain the provisions necessary to facilitate commercial and operational cooperation between adjacent TSOs. Individual Interconnection Agreements shall be established on a mandatory basis by all concerned TSOs at all interconnection points.

As a general requirement, the Network Code shall ensure that Interconnection Agreements respect the following criteria:

- *Impose no restriction to cross-border trade;*
- *Promote the development of competitive and liquid markets at both sides of the interconnection points.*

“The Network Code shall outline the mandatory terms of the Interconnection Agreements, including minimum requirements, on at least the following:

- *Modification of Interconnection Agreements*
- *Rules for flow control*
- *Measurement principles of gas quantities and quality*
- *Matching*
- *Rules for the allocation of gas quantities*
- *Exceptional events*
- *Dispute resolution between TSOs”*

> **Policy options and analysis of decisions**

The Regulation defines which aspects of an interconnection agreement (hereinafter referred to as an ‘IA’) should be established on a mandatory basis by all transmission system operators in respect of all interconnection points (hereinafter referred to as the ‘IPs’).

The Regulation defines the topics where mandatory rules are necessary (7 identified topics, see list in excerpt of the framework guidelines above). This list was supported by stakeholders during the interactive development process of the Regulation. It was also discussed to include more than those 7 mandatory terms in an IA. E.g. terms like liability, confidentiality, demarcation, pressure etc. certainly have to be part of an IA. But in line with the framework guidelines it was decided to focus only on the 7 mandatory terms in this regulation.

Some mandatory terms could affect network users. The Regulation identifies the matching rule, the allocation rule and the communication procedure towards network users in case of an exceptional event as relevant issues where the network users have to be informed and in order to gather their feedback prior to the transmission system operators making any changes. A minimum timeframe of one month and a maximum one of three month is considered to be appropriate for gathering the aforementioned feedback of the network users. In case national rules are specifying other timeframes then those have to be applied.

New IAs or any amendments have to be communicated by the transmission system operator to their respective national regulatory authority upon signature or when requested by such national regulatory authority.

> **Questions for Public Consultation**

- Do you agree with the proposed 7 identified issues for mandatory terms in an IA?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).

- No (as described in section B of the Supporting Document).
- Do you agree with the proposed 3 identified issues where network users have to be informed and to gather their feedback within a timeframe between one and three months in case of changes?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

b. Development of new and alignment of existing IAs (Art. 5)

> **Framework Guideline**

"The Network Code shall detail the process for the development and conclusion of new Interconnection Agreements.

The Network Code shall specify that Interconnection Agreements are communicated to the concerned NRAs upon their conclusion and amendment, and at the NRAs' request.

The above mentioned terms and requirements shall apply to all Interconnection Agreements, as well as to every amendment/renewal of such agreements, concluded after the Network Code becomes effective.

The Interconnection Agreements existing prior to the entry into force of the Network Code shall be adapted or complemented, only insofar as the topics listed above are not addressed therein, and the terms and minimum requirements are not met."

> **Policy options and analysis of decisions**

In line with Article 29 of this Regulation, after a 12-month period from the date upon which this Regulation enters into force (implementation period), all IAs must be compliant with the provisions of the Regulation.

The development process of an IA contains:

- Development of IAs before gas is first flowing, whether it is virtually or physically, over new IPs on the basis of nominated quantities by network users when the Regulation enters into force or within the implementation period and without an existing IA in place:
 - The relevant transmission system operators shall be required to have signed the respective IA in respect of the IP by no later than the expiry of the implementation period.
- Development of IAs before gas is first flowing, whether it is virtually or physically, over new IPs on the basis of nominated quantities by network users after the implementation period:
 - The relevant transmission system operators shall use their reasonable endeavours to agree a plan for the development and timely conclusion of the IA and
 - Ensure that gas is not flowing, whether it is virtually or physically, over new IPs on the basis of nominated quantities by network users until and unless an IA has been agreed upon and signed by the relevant transmission system operators.

The adaption and alignment process of an IA contains:

- Adaption of existing IAs when the Regulation enters into force:
 - Within the implementation period all transmission system operators shall analyze and, if necessary, take appropriate actions to adapt their existing IAs by no later than the final date of the implementation period. To avoid any legal vacuum and prevent any disturbance in operation, the existing terms of IAs shall continue to be in force until the adaption comes in to force.

In the beginning of the Regulation development process there was a specific process for the adaption and alignment of existing IAs. During the course of the development process it was recognized and proposed by several stakeholders that it makes sense to deal with the adaption of existing IAs in the Chapter about the development of IAs as the timing has to follow the same rules. Therefore it was decided to combine the adaption and alignment process with the development process.

In case transmission system operators are unable to agree to fulfil all the above mentioned and described requirements, the involved transmission system operators shall, where there is an existing settlement of disputes procedure under existing IAs, commence such procedure. Where no such procedure is available under an existing IA or where no IA exists, the involved transmission system operators shall seek to settle their dispute to comply with the Regulation provision through any available dispute resolution mechanism in the concerned member state(s). For the mandatory terms included in the Regulation, the default rules prescribed in the Regulation will be applied during the dispute resolution period starting from the final date of the implementation period.

Transmission system operators shall communicate any IA upon signature to their own national regulatory authority (see Art. 4)

> **Questions for Public Consultation**

- Do you agree with ENTSG's proposal for the development and alignment of IAs?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

c. **Mandatory terms**

- i. Amendment to interconnection agreement IAs (Art. 6)

> **Framework Guideline**

"Modification of Interconnection Agreements: The Network Code shall specify that Interconnection Agreements define a transparent process for their modification."

> Policy options and analysis of decisions

■ Reasons for Amendment

Transmission system operators shall modify an IA in case of a change in applicable legislation affecting the IA.

Transmission system operators will also have to consider any need to ensure the good implementation of the IA and modify accordingly the IA to reflect such need for operational or commercial purposes. For example a new compressor station with ramp-up ramp-down times or new pressure requirements for the IP could lead to the necessity to amend existing IAs.

■ Amendment Process

The Regulation requires that the involved transmission system operators shall meet and discuss in good faith, in order to adapt or amend provisions of the IA, and to implement the required work or action, if need be. The transmission system operators involved are expected to act as reasonable and prudent operators.

In case the matching rule, the allocation rule and/or the communication procedure towards network users in an exceptional event are subject to the amendment of an IA then the relevant network users have to be informed in order to gather their feedback (for details please refer to 2 a).

Some stakeholders considered that a maximum timeframe should be established within which any amendments to IAs should be completed. Other stakeholders argued that with an existing IA in force there is no need for a certain time period in which amendments to IAs have to be finished as the terms of the existing IA are still valid and shall be used until the amendment comes into force. With this reasoning it is also not necessary to involve national regulatory authorities in this process in case a time issue occurs. Therefore it was decided that the amendment process should be finalized within a reasonable timeframe which should be agreed upon between the parties involved. In case there is any deadline imposed by legislation or regulatory framework then this deadline has to be followed.

If an agreement cannot be reached, the dispute shall be finally settled in accordance with the settlement of disputes procedure defined under the existing IA.

Any amendment has to be sent for information to the involved national regulatory authorities.

> Questions for Public Consultation

- Do you consider that the above proposals meet an appropriate degree of transparency for modification of IAs?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

ii. Rules for flow control (Art. 7)

> **Framework Guideline**

“Rules for flow control: The Network Code shall require that IAs set out the rules that require TSOs at the interconnection points to agree on the timing, direction and procedures for flow control.”

> **Policy options and analysis of decisions**

The reason for agreeing on rules for flow control in an IA for an IP is to facilitate a controllable and predictable flow across the IP for the benefit of both transmission system operators and network users. In order to meet these requirements the rules in the IA should therefore cover the following items:

- The reference period for the flow control target is the hour.
- The input parameters to be used when agreeing upon the target flow.
- The accuracy sufficient to minimize the difference between the measured flow and the target flow.
- The flow stability, i.e. acceptable deviations within the reference period from a constant flow.
- Any special rules concerning for instance: ramp-up, ramp-down, minimum flow, switch of flow direction, etc.
- The minimum and maximum pressure.

For the predictability and efficiency of the transportation of gas and to meet the contractual pressure obligation a high level of accuracy and stability is desirable. The above mentioned rules determine that transmission system operators agree how to steer the flow and try to minimize the deviations for all network users.

Some of the above mentioned points will be explained in more detail:

- The input parameters to be used when agreeing upon the target flow.

When agreeing on the target flow for an hour transmission system operators shall take into account:

- The request of the network users expressed through their nominations and resulting in the confirmed quantities coming out of the matching process carried out by the transmission system operators.
- The need of the transmission system operators themselves relating to balancing account management. This is generally also part of the matching process.
- The gas transportation means available in the applicable transmission networks (such as compression) which are required to realize the requested gas flow. Issues such as ramp-up speed, ramp-down speed, minimum flow, flow direction reversal, etc. Such limitations may be covered by an operational balancing account in order to allocate gas according to the confirmed quantities of network users.

When agreeing on the target flow for an hour, transmission system operators may take into account:

- The planned (maintenance) and unplanned (exceptional event) limitations that may exist at the IP in either transmission network.
- Other issues such as safety, security of supply, emergencies or other considerations as specified by national rules applicable for each transmission system operator.

The matching process provides input through an automated process on an hourly basis. The other points may be more or less automated and can also have an ad hoc nature, for example: if an emergency shutdown of an installation results in a reduced flow over an IP.

- Accuracy of the measured flow when compared to the target flow.

The purpose of the agreement is twofold:

- An inaccurate flow would require the transmission system operators to compensate for the over-delivery or under-delivery at the IP in another manner in order to prevent imbalances in the gas transportation system which would lead to inefficiencies and e.g. system integrity
 - A flow which deviates from its target by more than the agreed upon accuracy is the first warning signal for a potential physical problem at the IP and allows the transmission system operators to take appropriate action in due time.
- Flow stability, i.e. acceptable deviations within the reference period from a constant flow.

Similarly to the accuracy, transmission system operators will agree to maintain flow stability for the same reasons as mentioned above.

- The aim is to keep the difference between the agreed target flow and actual flow as small as possible and the flow as 'flat' as possible.
 - An unstable flow would require the transmission system operators to compensate for the over-delivery or under-delivery at the IP in another manner which could lead to inefficiencies or endanger the transmission network integrity. An unstable flow which deviates from its target by more than the agreed upon stability is the first warning signal for a potential physical problem at the IP and allows transmission system operators to take appropriate action.
- Any special rules concerning for instance: ramp-up, ramp-down, minimum flow, switch of flow direction, etc.
 - The minimum and maximum pressure

A minimum and maximum pressure will need to be defined in order to meet the contractual obligations between the transmission system operators at an IP and in relation to transmission system operators and distribution system operators at other entry and exit points in the relevant grids of transmission system operators. The pressure range also has to reflect the technical design of the transportation networks.

- Default rules

There has been discussion with stakeholders about default rules for the flow control process. The principles described above were proposed as the default rule by ENTSG. However, some stakeholders considered that this was not specific enough. Especially the question

about which party is responsible for steering the flow and a clear-cut distinction between commercial and operational issues was missing. The two following rules are now inserted as default rules in the process of flow control:

- The transmission system operators controlling the flow control equipment shall, with the cooperation of adjacent transmission system operators, be responsible for steering the flow.
- Flow control actions taken at an IP are done only on an operational basis meaning that network users' confirmed quantities are not affected as long as an operational balancing account, as defined under Article 10 of the Regulation, is in place and any alteration action as described under paragraph 2, (c) of Article 7 of the Regulation doesn't have to be applied. Where no operational balancing account is in place network users' confirmed quantities will be affected only to the minimum extent possible.

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> Questions for Public Consultation

- Do you consider that ENTSGO proposal for rules concerning flow control is exhaustive?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

iii. Measurement principles for gas quantity and quality (Art. 8)

> Framework Guideline

“Measurement principles of gas quantities and quality: The Network Code shall ensure that Interconnection Agreements include provisions on methods and procedures for the measurement of gas quantities and quality, including harmonized conversion factors, as well as rules for the handling of differences in measurement and measurement corrections.”

> Policy options and analysis of decisions

The inclusion of measurement principles of gas quantities and quality in the IA provides for the agreement of these procedures between adjacent transmission system operators, thus improving the cooperation and coordination between them. Therefore, general rules and requirements about the content of these procedures have been defined, as follows:

- Adjacent transmission system operators shall agree on:
 - The measurement principles: there are several European, international and national standards in force related to measurement and quality issues that may be taken into consideration. The installation, operation and maintenance of measurement equipment shall comply with relevant national requirements of adjacent contracting parties. Discussions showed that this is an important point, because national regulatory rules can lead to a conflict at the interconnection point. One example for that: the measurement is performed by one of the

adjacent transmission system operators. The national regulatory authority under which the measurement performing transmission system operator resides does not allow investments or operational costs caused by the other national regulatory authority obligations (frequency of calibration of gas meters) which have to be applied by the other transmission system operator on the other side of the border at the IP;

- which transmission system operator is responsible for the installation, operation and maintenance of the measurement equipment;
- the means by which volume and energy delivered to/received from network users are to be measured at the interconnection point;
- which gas quality parameters are to be measured;
- for each parameter, the range and uncertainty over which the measurement equipment will operate, the frequency of measurement and in what units the measurement shall be made;
- the manner of data exchange between transmission system operators in respect of measurement data;
- arrangements that shall apply in the event of failure of the measurement equipment;
- the measurement validation arrangements and the quality assurance policy;
- the specific list of signals and alarms to be provided by the contracting party(ies) who own(s) and operate(s) the measurement equipment to the other contracting party(ies);
- Rules that shall apply between the contracting parties for access to the measurement facility, for additional verifications of the measurement facility, for modification of the measurement facility and for the attendance during calibration and maintenance work at the measurement facility.

Measurement principles within IAs should also contain rules to manage a situation where the volume and energy measurement equipment is found to be in error during the close-out period for allocations of gas to network users (either under-reading or over-reading outside of its defined uncertainty range). There was also a discussion to define a fixed timeframe as a close-out period for the final allocation between the relevant transmission system operators. But in line with the framework guidelines this is out of the scope of the Regulation and therefore it was decided to leave this out.

■ Default rule

As already mentioned above there are several European, international and national standards in force related to measurement and quality issues that may be taken into consideration. Internal discussions within ENTSG's members and external with stakeholders led to the proposal that where transmission system operators cannot agree on one of those measurement standards to be used for energy determination, then the latest

version of the European system standard EN1776 Functional Requirements for Gas Measuring Systems should apply as a default rule.

> **Questions for Public Consultation**

- Do you agree with the above proposals for measurement principles that should apply at an IP?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree that transmission system operators should be obliged to use the EN1776 standard as a default rule for energy measurement standard at an IP?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

iv. Matching (Art. 9)

> **Framework Guideline**

“Matching: The Network Code shall require that Interconnection Agreements include detailed Guideline regarding communication on the matching process between TSOs, as well as between TSOs and the relevant capacity booking platforms, with a view to assuring that confirmed quantities of gas are equal on both sides of the interconnection point. The Network Code shall define rules applicable to cases of mismatch, whereby the mismatch is either eliminated or otherwise reasonably resolved at least costs for TSOs and users.”

> **Policy options and analysis of decisions**

The Regulation requires all transmission system operators active at an IP to implement a matching process in order to manage network users’ nominations. The matching process describes the communication and processing of the relevant data among the transmission system operators to calculate the processed quantities and confirmed quantities of the network users and finally the resulting flow, which has to be used as one parameter amongst others as prescribed under Article 7 of the Regulation for the flow control at an IP.

In some countries the matching process is not carried out by the transmission system operators themselves but by appointed agents. Therefore the rules for the IA as part of the Regulation take account of this.

- Unbundled Capacity Products/Matching Process and Handling of Mismatches
 - Matching Rule

Flow is required to be calculated at both sides of an IP on an identical basis. Therefore, for the matching process adjacent transmission system operators mutually agree to apply a matching rule for that purpose. As default the lesser rule shall be applied. During the process of validating and confirming nominations, this rule will be applied, meaning that in case of different positions between delivering and receiving network users at the two sides of an IP, and in case neither of the two counterparties adjusts its position in due time, the higher of the two values will be reduced by the transmission system operator to the lower value in order to avoid a discontinuity over the IP.

Examples: Results of Lesser Rule		
Processed Quantity A	Processed Quantity B	Confirmed Quantity
100	100	100
-100	-120	-100
100	80	80
100	-50	0
100	Missing or wrong code	0

Figure 1: examples for the application of the lesser rule

Network users always have to know which rule is currently being applied in the matching process.

- Time Schedule Matching Process

Adjacent transmission system operators shall mutually agree in the IA on a time schedule for the matching process within the nomination and re-nomination cycle as well as on their roles in the matching process (e.g. which is the Initiating transmission system operator and which is the matching transmission system operator).

The timing of the communication process among the transmission system operators at an IP has to take into account the following points:

- The transmission system operators need to have all necessary data exchanged to inform the network users about their confirmed quantities before the end of the nomination/re-nomination cycle;
- Transmission system operators agree in the IA on a process to exchange the necessary data which allows them to do all calculation and communication steps in an accurate and timely manner.

The matching process which has to be performed within the nomination/re-nomination cycle of two hours has to be implemented with certain timing for each process step. The following time sequence can be considered to function as a default rule:

- Calculating and sending of processed quantity by Initiating transmission system operator within forty five minutes;
- Calculating and sending of confirmed quantity by matching transmission system operator within a further forty five minutes;
- Confirmation to network users and scheduling the network by all transmission system operators within a further thirty minutes;

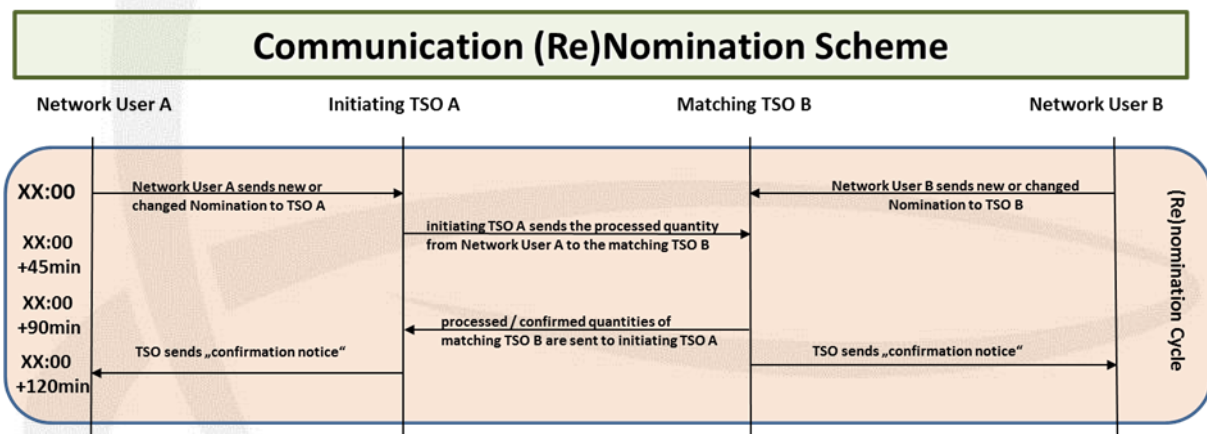


Figure 2: sequential timing of the matching process during a (re)nomination cycle

- Matching Process for Bundled Capacity Products

The aim of the matching process is merely to align the quantities in case of reduction of capacity on one or both sides of the IP, and/or to avoid differences due to mistakes during data communication. In case of bundled and unbundled capacity products at one IP, the matching process for bundled capacity products shall be integrated in the matching process for unbundled products in order to ensure that the flow at both sides of an IP is calculated on a consistent basis.

- Data exchange and content

The matching process implies the use of data communication between adjacent transmission system operators.

The Regulation defines the information to be exchanged for the matching process.

> **Questions for Public Consultation**

- Do you believe that the “lesser rule” fulfills the Framework Guidelines’ requirement to eliminate or otherwise reasonably resolve, at least costs for transmission system operators and network users, mismatches at IPs?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Is there any other information, in addition to the matching rule, that should be made available to network users?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

v. Rules for the allocation of gas quantities (Art. 10)

> **Framework Guideline**

“Rules for the allocation of gas quantities: the Network Code shall require that Interconnection Agreements stipulate how TSOs should cooperate and provide where necessary for consistent rules in the allocation of gas quantities to shippers in the interconnection point at both sides, as well as the solutions for managing gas quality differences, as detailed in section 4 below. Furthermore, the Network Code shall require TSOs to agree on business rules linked to the handling of steering differences, with an Operational Balancing Account as a standard preferred option.”

> **Policy options and analysis of decisions**

The allocation rules either side of an IP should not present a barrier to cross border trade and should ensure that all network users are informed about the allocation methodology in place. The allocation rules have to be consistent at both sides of an IP. Whenever an update of the allocation rule is needed, all involved network users need to be informed by the relevant transmission system operators well in advance. These rules have to be reflected in the transportation contracts between transmission system operators and network users. The allocation of energy takes place on the basis of confirmed or metered quantities.

There are 4 different allocation options that can be applied:

- 1) If the steering difference is allocated to the operational balancing account (hereinafter referred to as ‘OBA’), of the transmission system operators the confirmed quantities will be allocated to the network users;

Allocation Rule “OBA”

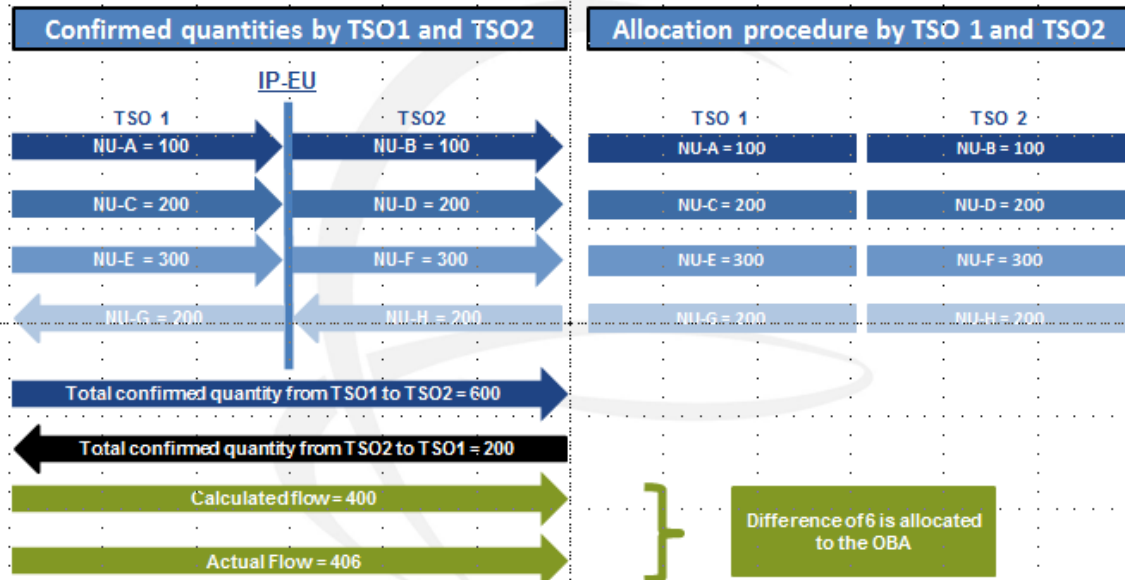


Figure 3: example for the allocation rule OBA

- 2) If the steering difference is allocated to a balancing network user, the confirmed quantities will be allocated to the non-balancing network users;

Allocation Rule “Balancing Network User”

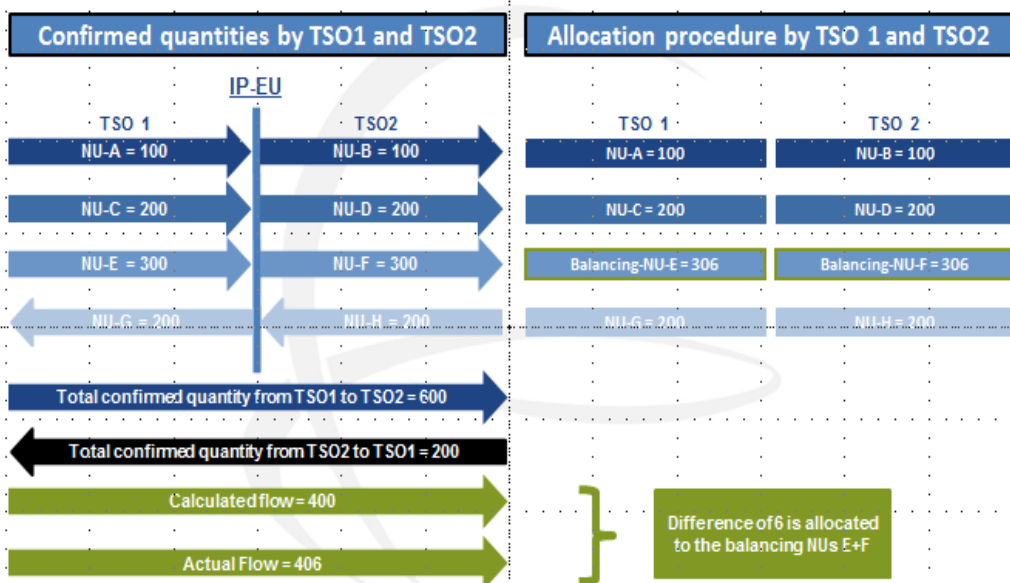


Figure 4: example for allocation rule balancing network user

3) The metered quantities are fully allocated on a “*pro-rata*” basis rule to all network users;

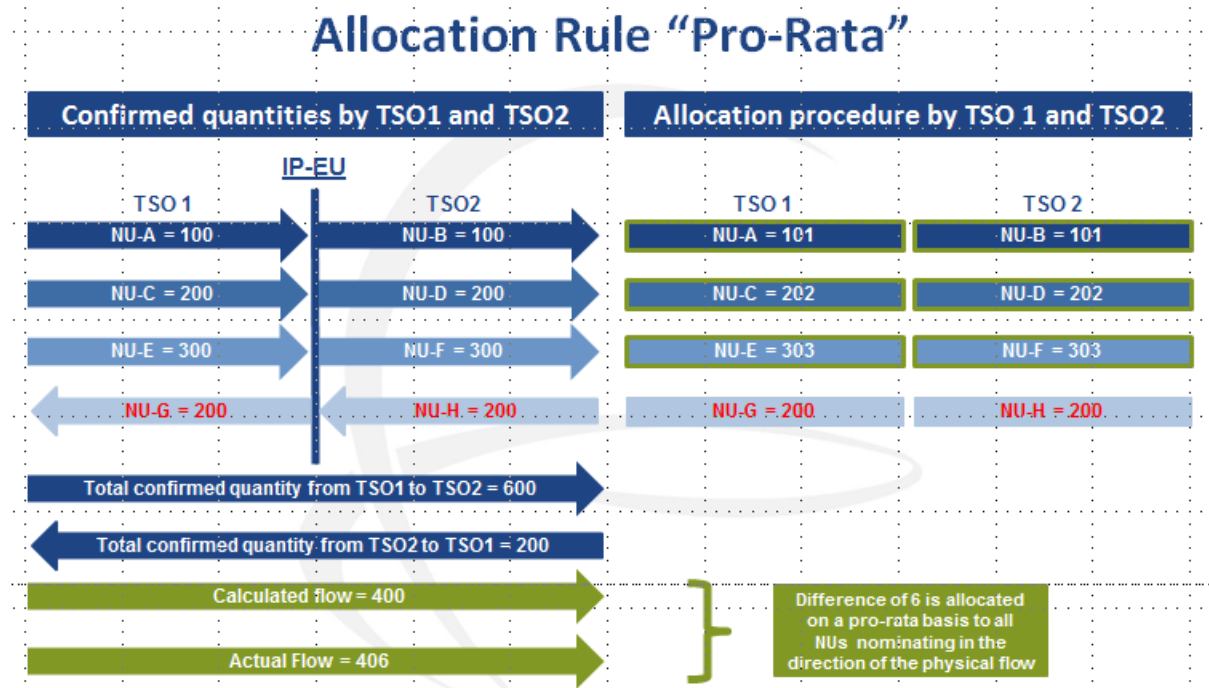


Figure 5: example for the allocation rule pro-rata

4) An allocation agent carries out the allocation functions appointed by the network users based on rules agreed between the agent and the network users.

During the SJWSs, stakeholders expressed a preference for an ‘allocate as nominate’ rule supported by OBA between the transmission system operators to manage any steering difference. Under this allocation regime, network users know exactly about the quantities entering into or withdrawing out of their portfolios at an IP. The risk of being affected by steering differences or other operational issues is thus reduced to a minimum extend possible. Also the Framework Guidelines identified OBA as the preferred allocation rule and unless another prevailing option in existing interconnection agreements is maintained or, following consultation for new interconnection agreements, the contracting parties choose another option, the OBA shall be the rule introduced in the IA.

ENTSO-G therefore proposes that the default rule to be applied will be the OBA type of allocation; however it was recognised that such a method could not be immediately applied because the terms of the OBA, notably the limits, need to be negotiated. The idea of default OBA limits was considered but ultimately rejected because there are many differing system characteristics within the 27 member states and in transmission system operators’ view a “one-size fits-all” OBA would not be appropriate. Therefore, where transmission system operators are unable to agree on an allocation rule, the OBA shall apply and transmission system operators will have to agree upon a certain size for the OBA within the

implementation period. If transmission system operators cannot agree on such a size by reason of the different characteristics of the relevant transport grids they have to involve the relevant national regulatory authorities in due time to justify their decision.

> **Questions for Public Consultation**

- Do you agree with the proposed default allocation rule (OBA)? Which reasons do you see for having another allocation rule as the default allocation rule (OBA)?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree with ENTSG's proposal for stakeholder consultation concerning non-OBA allocation rule options?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

vi. Exceptional events (Art. 11)

> **Framework Guideline**

"Exceptional events: the Network Code shall require that Interconnection Agreements include provisions on the way in which TSOs establish contact with the adjacent TSOs, as well as with network users and coordinate necessary actions in case of an exceptional event. The Interconnection Agreements shall in particular define the content and timing of information to be exchanged."

> **Policy options and analysis of decisions**

In case an exceptional event occurs the original confirmed quantities may no longer be transported and may have to be reduced. As the outcome of an exceptional event cannot be defined before the event occurs (as well as the technical difficulties to solve it), it is impossible to define harmonised timing for communication. As a general provision transmission system operators should be obliged to inform each other and network users with all necessary information as soon as possible. The priorities in case of such an event shall be the safety of people, then the security of the network and finally provision of information.

In the discussions about the information to be exchanged between the concerned parties it became clear that this can be harmonised only to a certain extent. There is a need to be flexible to cater for a range of events. The communication means should be easy-to-use and

should allow a fast and simultaneous communication to all concerned parties. The use of different electronic message types as well as the use of web based information provision, phone call, fax and emails as options were discussed. It was agreed that the fastest and easiest means of communication between transmission system operators is phone call. Therefore this is recommended as the first choice for the transmission system operator-transmission system operator initial information channel. This has limits in terms of informing a lot of network users in a very short time period. Therefore email or other electronic message can serve as the appropriate communication means. So depending on the number of network users which have to be informed, phone call and/or other electronic messages have to be used.

The Regulation does not cover any financial, commercial or legal consequences of an exceptional event.

- Communication and Coordination of Operation

The transmission system operators who is the owner of the transportation network in which the exceptional event occurs has to inform without delay the adjacent transmission system operator about the nature, the expected duration of the event, and the possible impact on the confirmed quantities of network users. It is proposed that both transmission system operators shall keep each other informed about all relevant issues and the progress in solving the consequences of the event and about any relevant changes in its magnitude. The common aim should be to mitigate the consequences of the event as much as possible and finalize it in the shortest possible time.

Both transmission system operators shall promptly inform their affected network users about the nature and expected duration of the event and any consequences for the confirmed quantities.

- Communication between transmission system operators

As previously mentioned the communication means should be adapted in terms of ease-of-use and efficiency. The means should be agreed and defined in the IA.

The first choice should be the faster means available of phone call. Afterwards following agreed usual business practices transmission system operators should confirm their actions taken in writing using fax, email or other agreed upon means for that. There should always be a fall-back communications solution to prevent any temporary failure, to be agreed by the contracting parties.

- Communication between transmission system operators and network users

Transmission system operators in their role as reasonable and prudent operators need to inform all relevant network users rapidly. However, as discussed above, timescales cannot be defined to cater for all exceptional events. Therefore the business rule "As soon as is reasonably practicable" after it becomes apparent to the transmission system operators that

the confirmed quantities of network users will be affected due to an exceptional event shall be applied meaning that both transmission system operators shall inform their network users with respect to the relevant IP about:

- the nature;
- the expected duration of the event; and
- any consequences for the confirmed quantities.

The communication means should be adapted for the purpose of ease-of-use and efficiency.

> **Questions for Public Consultation**

- Do you agree with ENTSG's proposal for exceptional events?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

vii. Settlement of disputes (Art. 12)

> **Framework Guideline**

"Dispute resolution between TSOs: the Network Code shall require that Interconnection Agreements outline a dispute resolution procedure between TSOs."

> **Policy options and analysis of decisions**

Please dispute resolution in Final provisions of the Supporting Document.

> **Questions for Public Consultation**

- Do you agree with the principle that disputes arising out of an existing IA could be settled by an independent expert where transmission system operators are unable to resolve between themselves?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you believe that national regulatory authority should be involved in the resolution of such disputes? If so to what extent?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

d. Default Rules

> Framework Guideline

“In addition, the Network Code shall provide for default rules on each of the above topics, to be directly applicable in the event the TSOs fail to reach a mutually acceptable agreement on any of these, within a period of 12 months.

Where a default rule implies that data is exchanged between TSOs or between TSOs and network users, the precise content of the information to be exchanged as a consequence of the default rule is to be set out in the Network Code.”

> Policy options and analysis of decisions

The Regulation defines to the extent feasible and reasonable a default rule for the mandatory items. Therefore where relevant, default rules are inserted in the Regulation. The content of the default rules needs to prescribe standard terms leaving where and to the extent necessary the sufficient flexibility to adapt the IA adequately to the needs of the parties involved taking into account any and all relevant specificities applicable at the concerned IP. For more details about the defined default rules see the relevant sections of the Regulation.

3. Units (Art 13 -> 15)

> Framework Guideline

“A lack of harmonisation with regard to the units used by TSOs along the gas value chain may constitute a barrier to cross-border trade and access to markets. The Network Code shall determine the use of harmonised units at least for energy, volume, pressure and gross calorific value, for the TSOs to use when communicating to counterparties.

Where the harmonisation of units has already been covered by EU legislation⁷ or in a Network Code adopted by ENTSOG under Art 8(2) of the Gas Regulation, the Network Code shall not duplicate these provisions, but shall introduce further harmonisation, insofar it is deemed necessary for the purposes of interoperability as defined in these Framework Guideline.”

> Policy options and analysis of decisions

In order to further harmonize and streamline the use of units along the whole gas chain the transmission system operators shall agree upon the use of a common set of units when communicating among each other or with counterparties.

⁷ See, for instance, Commission Decision of 10 November 2010 amending Chapter 3 of Annex I to Regulation 715/2009 of the European Parliament and of the Council on conditions for access to the natural gas transmission networks (2010/685/EU), OJL 293/67, 11.11.2010.

- **Common Set of Units**

ENTSOG proposes to extend the range of units indicated in the Framework Guidelines to include temperature and Wobbe index.

For pressure, it should be indicated in the IA whether it refers to absolute (bar(a)) or gauge (bar(g)). There were some discussions whether to go for one of the two reference options only. But, as the absolute reference is commonly used for billing purposes while the relative (above atmospheric) reference is more common and related to every day operation, it became clear that there is widespread use of both options and that it is appropriate to allow for both options.

There was also a lot of stakeholder involvement about the use of kWh and the reference temperature of 25°C. CEN stated that this is not consistent with the range of European Standards they have developed. These inconsistencies may lead to conversion differences.

- **Utilisation of Common Set of Units**

The common set of units shall be used for all communications in writing and which is related to the transportation of gas across an IP between adjacent transmission system operators and between transmission system operators and other counterparties or in respect of the publication of data on a common platform.

- **Utilisation of other Units**

The utilization of other units for data communication between adjacent transmission system operators where both parties agree and between transmission system operators and other counterparties shall be permitted in addition. Especially the use of CEN approved units according to the latest version of EN 437 shall be permitted but not in substitution to those provided in the common sets of units.

> **Questions for Public Consultation**

- Do you agree with the list of items for which common units are proposed? (pressure, temperature, etc.)
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree with the proposed common units for these items (bar, °C etc.)?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

- Do you agree with the proposed scope within which transmission system operators would be obliged to use common units?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Will in your opinion the identified difference between the reference conditions for parameters used in CEN-standards and the reference conditions defined in ENTSG's proposal represent a barrier?
 - Yes (please explain).
 - No (please explain).

4. Gas Quality

a. Handling Gas Quality Differences (Art. 16-17)

> Framework Guideline

"The Network Code shall specify that adjacent TSOs agree where necessary on the handling of gas quality differences at each side of a given interconnection point. The Network Code shall require that TSOs on either side of the interconnection point closely cooperate and work out technically feasible and financially reasonable solutions to handle gas quality issues. Possible solutions might include, but shall not be restricted to, swapping, co-mingling and flow commitments. The solutions shall be such that they support the removal of barriers to cross-border trade resulting from the different gas qualities. TSOs shall jointly determine the solutions facilitating cross-border trade based on a cost-benefit analysis and submit them for approval to the relevant NRAs⁸, following a public consultation with the market."

> Policy options and analysis of decisions

While the CEN mandate M/400 envisages gas quality harmonisation within the EU, the eventual standard is unlikely to be adopted by all member states at the same time; hence differences in gas quality specifications at cross border locations may persist.

Whilst the Cost Benefit Analysis on gas quality harmonization published by Pöyry⁹ identified relatively few cases where physical flow of gas was rejected by transmission system operators because of gas quality issues, some transmission system operators have actively

⁸ Articles 40 and 41 of the Directive No. 73/2009.

⁹ http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/2012_gas_quality_harmonisation_cost_benefit_analysis.pdf

managed gas quality on their networks to prevent constraints from occurring. ENTSG recognizes that gas quality differences could potentially prevent gas from flowing across borders, therefore there is a paragraph in the Framework Guidelines obliging transmission system operators to cooperate in order to identify where this might be an issue and if necessary find a technically feasible and cost-effective solution to address it. The scope of this work should be limited to physical flows of gas, where those differences might create a barrier to cross-border trade.

In line with the Framework Guideline, ENTSG has drafted a procedure in the Regulation under which transmission system operators would be obliged to regularly review whether gas quality either is, or could be, a barrier to cross border flows for their IPs.

First, adjacent transmission system operators would have to analyse each existing IP, where a physical flow of gas occurs and establish whether there are differences in gas quality limits and/or ranges for the various parameters (e.g. Wobbe index, GCV, total sulphur...) between the adjacent transmission networks at both sides of the IP. If so, transmission system operators should then proceed to analyse if there is, or could be, a barrier to physical cross-border gas flows taking into account the following criteria:

- frequency of occurrence of hampered flow (based on historical data);
- expected future gas flows and gas qualities (could be based on the Long term Gas Quality Monitoring Outlook done by ENTSG).

It should be noted that the existence of different specifications per se does not necessarily mean that a problem exists. For example, if gas could only physically flow in one direction across an IP from a network with a narrow specification to a network with a wide specification, this situation would not require any solution to be developed¹⁰.

If transmission system operators agree that the physical flow of gas either is or could in the future be hampered due to different gas quality specifications at either side of an IP and that a solution is required, transmission system operators should jointly investigate options to address the situation. ENTSG foresees a period of 12 months after the Regulation comes into force for transmission system operators to identify any barriers and to seek potential solutions to address them. Transmission system operators' assessments are envisaged to include the following criteria:

- Availability of technology (for physical solutions);
- Efficiency, cost and practicality of implementation;
- Investigation of the feasibility of commercial solutions.

Existing arrangements could serve as a benchmark for the potential solutions.

¹⁰Art.7 of Regulation 994/2010 requires all IPs in Europe to be physically bi-directional, however there are some exemptions that are currently in force.

ENTSO-G, in line with the views expressed in the SJWSs, believes that early involvement of national regulatory authorities in this process (transmission system operators informing national regulatory authorities when a barrier is identified) is crucial, because transmission system operators are not responsible for security of supply and may need to agree on the cost recovery mechanism with their national regulatory authority to support the process of exploring options. Whenever transmission system operators fail to reach agreement in identifying if a solution is required, then the dispute resolution rules of the Regulation should apply.

After identifying different options for a solution, it is proposed that transmission system operators shall launch a public consultation to seek stakeholder views on potential solutions. Taking account of such views (insofar as it is reasonably practicable to do so), transmission system operators should jointly agree on the solution and submit their proposal to the relevant national regulatory authorities for approval of the solution and the cost recovery mechanism.

ENTSO-G has identified a sample set of potential solutions/technologies as remediation for identified barriers, but their cost-efficiency may vary from point to point:

i. Commercial measures:

- **flow commitments:** are contractual arrangements between network users and transmission system operators providing the transmission system operator with the option to request network users to manage their inputs or off-takes resulting in gas flows within an agreed range at one or more entry or exit points, for the purpose of maintaining existing entry and exit capacities. ENTSO-G is not currently aware of any transmission system operators using flow commitment to address gas quality issues.

ii. Other potential solutions

- **swapping:** adjacent transmission system operators have the opportunity to swap amounts of gas on reasonable endeavors basis. Swapping nowadays is used mainly for optimization of flows through the networks, and also to minimize the impact of planned maintenance or in case of technical problems.

iii. Natural gas adjustment:

Natural gas adjustment can be achieved by mixing of different gas streams/sources in order to obtain gas which meets national specifications. This can be done by:

- **blending:** gas that is not compliant with a quality specification can potentially be mixed with other gases so that the resulting mix is within the gas quality specification range.
- **co-mingling:** this is a form of gas blending and refers to a situation where two or more gas streams blend fortuitously prior to the gas entering the network on which the gas quality limits apply with the aim of delivering an acceptable 'blended' gas. However where the blend of gases is not compliant, the non-compliant stream may need to be curtailed by the transmission system operator, therefore co-mingling can be thought of

as a blending arrangement which the transmission system operator provides no guarantee it can accommodate.

iv. Gas treatment:

Physical treatment of natural gas (injection or removal of certain compounds) requires the installation of specific processing facilities (for example, nitrogen ballasting of high Wobbe gases) for which there are both capital costs (CAPEX) and operational costs (OPEX).

ENTSOG recognizes that even though a solution may already be in operation, the gas quality differences may persist in the future due to further diversification of gas sources and/or changes to national specifications. Having this in mind, a review process every subsequent year is proposed, where transmission system operators should review any existing solution by checking if:

- the applied solution is efficient;
- there is a new constraint identified;
- changes in gas flows and qualities can be expected.

Some stakeholders considered that the Regulation should address the question of who is responsible for gas quality. Although it is an important issue, in ENTSOG's view, the Regulation is not the place to describe this, as it is not an interoperability issue nor is it included within the scope of the Framework Guidelines and furthermore the Regulation can only place obligations on transmission system operators.

Some stakeholders also considered that the Regulation should reference the CEN standard for gas quality that is currently under development under the EC mandate M/400. However, in ENTSOG's view this is out of scope for the Regulation based on the contents of the Framework Guidelines and because it will be a decision for each member state whether or not to adopt this standard and the Regulation should not make a reference to non-existing standards.

> **Questions for Public Consultation**

- Do you agree with the proposed process and timeline for transmission system operators to handle possible physical flow barriers due to difference in gas quality specifications?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

- Do you agree with the proposed way of early involvement of national regulatory authorities in the process?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

b. Short Term Monitoring (Art. 18-19)

> **Framework Guideline**

“The Network Code shall oblige TSOs to provide relevant network users with pertinent indicative information on Gas Quality and variations thereto. The Network Code shall classify the cases where it is necessary or useful to provide further information to end-users or suppliers on fluctuations of gas quality in order to allow them to take preventive measures. The Network Code shall identify the nature and frequency of submission of such information after duly consulting all concerned parties, so as to allow the concerned parties to take account of the gas quality variations.”

> **Policy options and analysis of decisions**

Framework Guidelines require ENTSG to seek the solution to inform sensitive end-users with pertinent gas quality variation information. However having received the feedback that the most sensitive industry sectors to gas quality variations are: power generation sector, chemical industries using gas as feedstock and industrial manufacturers, but having regard to the fact that this selection creates a potentially big list of eligible users (leading to difficulties in managing and high implementation costs), ENTSG proposes to define specific criteria to the extent reasonably possible which would serve as a basis to identify at national level more precisely those in real need of the quality information. Moreover nowadays there are only few cases when the real gas quality received by end-users is fluctuating from the lower to the upper limit of the national specification, but due to the future diversification of sources it may become more common. The complexity of the gas networks, diversified gas sources, whether the national specification is relatively wide or relatively narrow, real flows, complexity of equipment in operation as well as different location of industrial end-users in the selected gas networks supports the proposal for the selection process of relevant end-users to be at national level.

Moreover it was investigated whether this information provision can be harmonised by publishing on transmission system operators’ websites, zones with similar gas qualities and with updates of expected variations. In this case there would be no necessity to identify the sensitive eligible user. For complex systems, however, it is difficult to define such zones as they will expand and reduce according to prevailing flow patterns, and quality forecasting may require investments in new chromatographs, simulating tools and new IT systems by

transmission system operators. Through the consultation, ENTSOG has identified that even from end-users' point of view it is more useful for them to have direct information when there are big variations on gas quality parameters that may harm their operation.

ENTSOG as well as end-users believe that proper selection of parties eligible to potentially receive indicative gas quality information can be done effectively only on a case by case basis, by understanding the specific operation, capability of adjustment and specific sensitivity of individual processes and also that this is the most cost efficient way to identify requirements for this service. End-users agreed that the best solution can be chosen only case by case (tailor-made solution) depending on the network (i.e. meshed or transit).

Therefore after consulting with stakeholders, it was decided that information provision included in this Chapter shall facilitate better cooperation between transmission system operators and market participants, but should not incur additional costs to be borne by the transmission system operators. Hence information shall be provided using existing transmission system operator's equipment/infrastructure.

There are already a few examples in place of such cooperation between transmission system operators and parties eligible for receiving gas quality information in place. These are:

1. Belgium: development of an 'alert' system to be provided in reasonable time to selected sensitive end-users where gas quality may vary significantly and may influence their operation;
2. The Netherlands: publishing on the website real time information on gas quality parameters transmitted from existing measuring equipment from their network and identifying the map of zones indicating which chromatograph reading may be specific for which area.

Furthermore, stakeholders have widely expressed a wish for increased transparency regarding gas quality real time information. Therefore ENTSOG took this on board by proposing that transmission system operators publish near real time gas quality data at least once per hour for WI and GCV for gas entering a transmission system operator's network at a physical interconnection point. In ENTSOG's and end-users' opinion this can also be the solution for some sensitive eligible users located in countries with more stable gas quality and less complex networks or in some places where eligible parties to potentially receive indicative gas quality information users are located close to an IP. However, it would not be of value wherever a sensitive end user receives a commingled gas from more than one source. This additional proposal met the support from some stakeholders.

Therefore, ENTSOG proposes that the Regulation put an obligation on transmission system operators to define the list of parties eligible to potentially receive gas quality information at the national level and further to cooperate with the selected end customers for defining the details of this service including: the nature of indicative information, the frequency of update, the lead-time, how the information will be exchanged and the existing measurement point from the transmission system operators' network that will be relevant for specific end-customer. Moreover the Regulation obliges transmission system operators

to publish on their websites with a frequency of at least once per hour during the gas day near real time values of Wobbe index and GCV for gas entering their transmission networks at a physical IP.

Information provided by the transmission system operators will be indicative only, with no liability whatsoever inferred.

> Questions for Public Consultation

- Do you agree with the proposal of Regulation to define minimum list of requirements for short term monitoring at EU level and shift the selection process of eligible users at the national level?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Would you find it useful to have access to real time information on WI and GCV on IPs?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

c. Long Term Monitoring (Art. 20)

> Framework Guideline

"The Network Code shall propose rules to reinforce transparency as well as the cooperation of TSOs on the issue of gas quality in order to prevent differences in gas quality from creating an obstacle to gas market integration.

[...]

As part of the tasks described in Article 8(3) of the Gas Regulation, ENTSG shall, based on information provided by TSO's, submit an outlook, reviewed every two years, on the possible changes in gas quality within the major European regions [as defined within the Gas Regional Initiatives] for the next 10 years."

> Policy options and analysis of decisions

This part of the Framework Guidelines requires ENTSG to provide a view about the gas quality that could possibly be transported through transmission system operators' networks in the future (10-year outlook). Transmission system operators may be able to contribute general views and make assumptions about what this might mean for gas quality (e.g. a

growth in biomethane might be expected to reduce calorific value and Wobbe index), however this will ultimately be determined by the plans of upstream parties.

ENTSO-G therefore envisages that the report could be developed by building on the Ten Year Network Development Plan (TYNDP) experience and making additional assumptions about scenarios on the gas quality of every supply source. Expected results could be the identification of possible trends in the evolution of gas quality together with an overview of the possible evolution of Wobbe index variability at the level of major European regions. The interpretations of these results will have to be done having in mind their dependence on all the assumptions and methodologies.

ENTSO-G TYNDP's target is now rather well defined (Supply adequacy outlook, resilience assessment and identification of investment gaps and remedies) and the report is already extensive according to many stakeholders. Including the gas quality outlook in TYNDP could deteriorate the readability. ENTSOG proposes to make the gas quality outlook as a stand-alone report.

Based on the TYNDP-process the outlook will rely on flow pattern as deriving from scenarios, cases and methodologies defined with stakeholders. The approach is based on a range of extreme but still realistic scenarios ensuring the robustness of the report. The outlook of gas quality will require the development of scenarios on each gas quality parameter to be monitored. As for supply availability, it is possible to develop several scenarios for each parameter. In any case, these scenarios could be compared with the review of parameters value during the timespan between two consecutive reports.

The main challenge in the drafting of the outlook will be whether upstream parties who will hold information about potential future quality will be willing to share such information. The selected approach is forecasting approach based on the expected composition of each supply source in the future.

> **Questions for Public Consultation**

- Do you agree with the proposal of defining a stand-alone gas quality outlook, based on flow pattern scenario used by ENTSOG in TYNDP-process?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree that the report should focus on Wobbe index changes?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

- Do you find it useful to produce a long term gas quality outlook?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

5. Odourisation (Art. 21)

> Framework Guideline

“The Network Code shall ensure that cross-border flows are not hampered by differences in odourisation practices between adjacent systems.

The Network Code shall encourage TSOs at each interconnection point to reach an agreement to address effectively barriers resulting from differences in odourisation practices. The Network Code shall specify that, if the relevant TSOs, within six months after the entry into force of the network code, fail to reach such an agreement or if the agreement is deemed by the concerned NRAs to be not sufficiently effective in addressing barriers resulting from differences in odourisation practices, the TSOs, by cooperating with relevant Member State Authorities, are required to define, within the following twelve months, a detailed plan to implement a shift towards physical flows of non-odorised gas at the specific cross-border interconnection point, using the most cost-effective option. The assessment leading to the choice of option for shifting towards physical flows of non-odorised gas shall take the implementation time into account and be submitted to the concerned NRAs for approval. The network code shall indicate that Article 7(4) of Regulation (EC) No 713/2009 applies to the determinations of NRAs referred to above.”

> Policy options and analysis of decisions

Since flows can be impeded due to different odourisation practices in the member states across EU cross-border, the Framework Guidelines require that relevant transmission system operators work to resolve the issue either via bilateral agreements or by taking steps, by cooperating with relevant authorities, to facilitate a shift towards transportation of non-odourised gas at the relevant IPs. The cooperation with the authorities is required, since transmission system operators cannot decide unilaterally to change odourisation practices on its own. ENTSG believes that shift towards flows of non-odourised gas should not exclude de-odourisation solutions, but further analysis is needed in order to identify a cost efficient and proven technology and possible acceptance of the level of odourant after the de-odourisation process.

During the SJWSs some stakeholders expressed their concern that shifting the odourisation practices from transmission system operator’s entry point to transmission system operator’s

exit point will affect distribution system operators and create additional investments and costs. It was expressed as well that transmission system operator, when agreeing that odourisation practices create a barrier to trade, should actively identify and give an assessment of the impacts related to the eventual flow of odourised gas and evaluate local solutions to mitigate those impacts and at last define the level of odourant in the gas below which those impacts are acceptable. Because of that during the 6-months period of trying to reach bilateral agreement, transmission system operators should produce an assessment of those impacts to encourage adjacent transmission system operators to reach bilateral agreements.

Most of the countries do not odourise gas at the transmission level, but on the distribution level. However, there are some countries that do odourise gas at transmission level due to safety issues and/or economic reasons (France, Spain, Ireland and Hungary).

Where there are different odourisation practices by transmission system operators either side of an IP, transmission system operators should have 6 months in order to reach bilateral agreement.

As it is written in the Framework Guidelines and the Regulation, transmission system operators shall actively cooperate in order to ensure that cross-border flows are not impeded by these differences and also taking into account the stakeholders' views expressed during the SJWSs, transmission system operators are encouraged to collaborate in the identification and assessment of the consequences related to receive flows of odourised gas into the non-odourised network and in the definition of the possible acceptable level of odourant permitted in case of de-odourisation. At this stage, neighbouring transmission system operators that might receive these flows of gas, shall be involved in this process. As it is established in the Framework Guidelines such agreement has to be submitted to national regulatory authorities for approval.

If transmission system operators fail to reach a bilateral agreement within 6 months or the agreement is deemed by national regulatory authorities, within 12 months transmission system operators have to submit detailed planning how the goal of shifting towards cross border flow of non-odourised gas can be reached.

Moreover, there are different odourants used across the EU. As it has been reported in the Marcogaz' paper GI-OD-12-03 from October 2012¹¹, usually no masking effects are reported from mixture of different sulphur odorants, even if it can be hypothesized some effects of enhancement of the odour in mixtures between sulphides and mercaptans (for example in

¹¹ Marcogaz GI-OD-12-03_D129 Odourisation and interoperability Final document 09-10-2012:
http://www.marcogaz.org/index.php/component/docman/doc_download/1308-gi-od-12-03d129-odourisation-and-interoperability-final-document-09-10-2012?Itemid=135

mixtures containing TBM and MES) which make it difficult to predict the strength of smell of the mixture. In case of mixtures of sulphur odorants and sulphur free odorants, no public data are available yet and it could be necessary to perform olfactory tests to know the behaviour of the mixture in terms of odour. The masking effects may cause safety issues.

> **Questions for Public Consultation**

- Do you agree with ENTSOGs' proposal that if cross-border flows are hampered by differences in odourisation practices between adjacent systems and transmission system operators cannot reach a bilateral agreement they should shift towards flow of non-odourised gas?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you think that ENTSOGs' proposal encourage transmission system operators at each interconnection point to reach an agreement to address effectively barriers resulting from differences in odourisation practices?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

6. Data Exchange (Art. 22-> 27)

> Framework Guideline

"Without prejudice to existing legislation, the Framework Guideline aim at extending harmonisation of data exchange solutions to all areas where TSOs exchange data among themselves or communicate data to counterparties.

The Network Code shall foresee a common set of data formats, data network and exchange protocol ('data exchange solution') for the reliable, secure and smooth exchange of information among TSOs, as well as from TSOs to relevant counterparties.

The selection of such a Data Exchange solution by ENTSOG shall be based on a cost-benefit analysis subject to public consultation. This analysis, as well as the subsequent selection process will take into account in particular the following considerations:

- *best available technologies, particularly in terms of security and reliability;*
- *the actual spread (whether the solution considered is widely used) of the solutions considered;*
- *the volume of data traffic required to transfer information;*
- *the costs of first introduction and cost of operation;*
- *the potential for discrimination of small shippers or new market entrants;*
- *the synergies with current electricity Data Exchange rules;*
- *the compatibility with counterparties' Data Exchange solutions."*

> Policy options and analysis of decisions

General provision - Data network (Art. 22):

Seeing the need for a non-discriminatory European wide and unlimited accessibility for all market participants on one hand, and the proven availability and the still increasing bandwidths allowing future growing data volumes for communication on the other hand, ENTSOG considers that the **Internet** should be the network for the common data exchange solutions arising from the Regulation (EC) No. 715/2009 and network codes developed to supplement it.

Common data exchange solutions (Art. 23)

▪ Communication types:

The most common way today to communicate between parties is document based, mainly because of historical reasons. By documents we have to understand what is meant by electronic text files that can be printed out.

Interactive data exchanges i.e. browsers became a new common way of exchanging data since the emergence of the Internet. Also new applications in the gas business offer this. The selection of the appropriate common communication solution type(s) will be defined case by case, depending on the communication requirements for the corresponding business process.

In cases where a very intense dialogue is required between systems, integrated data exchange is an appropriate solution. This is the most direct way to communicate between IT systems and end-users and offers more query flexibility. ENTSG has considered using only core web services and has discounted this in favour of the ebMS framework.

■ **Data content format standard:**

Today data formatting standards are applied on a voluntary basis between TSOs and are based on best practices. The only standardisation initiative that took place in Europe was and is still maintained by the Edig@s workgroup of EASEE-gas. This was initially based on a subset of the EDIFACT coding standard and is now on XML based defined schemas. The strength of XML is that it is an IT standard that is well integrated in IT development tools that are available on the market today.

Initial assessment to define the data exchange solution:

As defined in the Framework Guidelines, the selection of a data exchange solution by ENTSG shall be based on a cost-benefit analysis taking into account a list of criteria.

In the following paragraphs an initial assessment has been carried out, based on a relative comparison of the different solutions in relation with the requirements described in the Framework Guidelines.

■ **Synergies:**

Today there are different solutions implemented for document based data exchanges in the different segments of the energy business. EFET (European traders association) uses ebMS-v2 while ENTSG-E (European Network of Transmission System Operators for Electricity) has developed its own communication standard MADES (based on web services) and offers a communication platform ECP which is based on that standard. However, MADES is not implemented by all transmission system operators.

Although both systems from EFET and ENTSG-E are functional equivalent, it is not possible to merge the solutions into one common solution due to the different concepts put in place.

With respect to data formats, ENTSG sees no benefit in a common data content format for both energy sectors because of a substantial higher maintenance cost. The main reason is that if data formats are modified for new requirements in one sector, it would also require update activities in the other energy sector without any added value but with also a higher cost for coordination. Also a higher risk for failures due to a more complex data format would be expected.

■ **Document based data exchange protocol:**

Multiple communication protocols are used today as there are FTP (file transfer protocol) over ISDN, SFTP (secure FTP) over ISDN and Internet, AS2 over Internet, e-mail attachments,

ebMS, HTTPS (web services) and interactive solutions (web browsers). All of these solutions are functionally compatible but incompatible from a technical point of view.

The following communication protocols have been selected for evaluation based on actual spread, offered functionalities and current technological and security standards:

- AS2
- ebMS (subset of ebXML)
- AS4

Evaluation results: Please refer to Appendix A1, A2 and A3 for details about the technical evaluation.

○ Technical evaluation results:

AS4 has the best score; offers more options for the future mainly for the following reasons:

- Rich Meta Data in message header (e.g. service, action)
- Reception awareness
- Duplication detection
- Pull functionality (*)

(*) Pull functionality offers the possibility to the recipient of the message to request it at a time when he is ready to process it, so he does not need to be permanently on-line. Today there is no need for this functionality but excluding it now would mean that no business application would be able to use it in the future.

○ Cost evaluation:

- The operational and maintenance cost is considered independent of the selected solution since it concerns updating address list and other communication data parameters, a task that has to be performed in all cases.
- The cost for implementation of the communication solution depends on the platform that is already installed. In some cases, it is a matter of configuring a new communication channel in an existing product; in other cases it is implementing a new communication interface. The cost for a product licence depends on the choice made; it can vary from freeware to a full supported product. However the implementation cost for the compared protocols based on the same approach is expected to be equal.
- Expected life cycle: AS4 received a better score for this point. It is expected that the most recent technology will remain longer in operation which gives a longer period for amortization of the investment (implementation cost)

○ Risk evaluation: The following conclusions came out of the comparison:

- AS2: lower implementation risk, proven technology
- ebMS: technology well known but many options possible (used by EFET)
- AS4 - based on ebMS:
 - ✓ Higher risk since no experience by transmission system operators;
 - ✓ Risk can be minimized by installing an ENTSOG group to support the implementation and share experiences

○ Proposed solution: Taking into consideration the above criteria, **AS4¹² is the proposed preferred common communication protocol for document based data exchanges**. ENTSOG will manage and coordinate the implementation process.

■ **Overview cost benefit:**

The table below shows the different possibilities for harmonisation for document based data exchange.

The table is split in two parts;

- the top section contains the Data Format comparison
- the bottom section shows the communication protocol harmonisation comparison

The columns contain the following pieces of information:

- the option that is evaluated in the following columns;
- a qualitative score for the cost impact of the option. A correct quantitative cost is very difficult seeing the number of involved European parties on one hand and the different systems and different communications methods used today in the member states on the other hand;
- compliancy evaluation with the Framework Guideline from ACER;
- conclusion about the usefulness of the option taken into consideration.

¹² Final preferred data exchange protocol for document based data exchange will be defined by ENTSOG based on a Cost Benefit Analysis as requested in the Framework Guidelines.

	Options		Cost	Compliant with FG	Conclusion	remark
Data format	1	keep existing formats	no cost	no harmonization; incompatible solutions in EU --> not compliant	not compliant with FG	
	2	implement all existing formats	high cost for all parties to maintain all data formats	Barriers removed for interoperability No common set of data formats --> Not compliant	not cost efficient	
	3	Harmonisation : develop Business Requirements Specifications and common data formats	Minimal cost: All parties implement the same business model and data formats	full compliant	best solution for a minimum cost	Central governance of data formats required: ENTSOG-EASEE-gas cooperation on the EDIGAS-XML data format
Comm. Protocol	1	keep existing situation: different (incompatible) protocols in use	no cost	Limited communication possible between TSOs and CP	not compliant with FG	
	2	implement all existing protocols	high cost for all parties to maintain all protocols	Partial interoperability: no common agreement -->No harmonization	not compliant with FG	
	3	one protocol	cost for all parties to implement the protocol	Full interoperability	Not realistic seen the high number of local communications in some member states. Only a limited number of them need to communicate with other TSOs.	
	4	common protocol: co-existence with existing (local) protocols	All TSOs and only CP that do not support the current protocol need to implement the "common" protocol.	Full interoperability	Most cost efficient seen the limited number of implementations --> best solution for a minimum overall implementation cost	It is expected that the common solution will replace over time all existing solutions

Table 2: cost-benefit analysis data exchange protocol and data format

The outcome is that one **common protocol** for each type of data exchange in combination with the **Edig@s-XML**¹³ data format standard could be the most realistic approach, as indicated in the green colour boxes. However, the communication solutions in place today can still be used on a bi-lateral basis as long as they are functionally compliant with the requirements of the corresponding network codes.

A Cost Benefit Analysis (CBA) in line with the identified criteria in the Framework Guidelines will be established by ENTSG and the outcome will be taken into account in the Regulation. A specific Workshop to present the draft CBA will be organised by ENTSG on 23 April 2013.

¹³ The consistency to foresee inside an EU Regulation an obligation to use a specific trademark/supplier ('Edig@s') is subject to further legal assessment.

Data exchange system security and availability (Art. 24):

This article defines the obligations and responsibilities with respect to data and system protection of the parties involved. It also defines the responsibility of the transmission system operators with respect to system availability and planned interventions on the IT communication system.

As the interest from malicious parties for IT systems and exchanged information over internet increases and more and more systems are compromised by hackers, the communicating parties are required to put in place appropriate security measures on their own system. In this way they will prevent intrusion from malicious parties and prevent that confidential, commercial information will fall into the wrong hands.

Communication systems with high availability are crucial to an open and good functioning market. For this reason parties should lift as much as possible single-points of failure and arrange for the highest **availability** within reasonable cost.

In case transmission system operators (or service providers acting on their behalf) need to stop their communication systems for **maintenance** reasons or when there is a disruption of the service, they shall be obliged to inform all communication partners in a timely manner prior to the scheduled interruption or as soon as the disruption occurs. Furthermore they shall undertake all reasonable endeavours to minimize the duration of the interruption of the data exchanges in order to minimize the impact on the gas operations.

Implementation (Art. 25):

The Framework Guidelines limits the implementation period to 12 months regarding the provisions on **common data exchange solution**.

Today there are different communication technologies implemented all over Europe for data exchange, going from different types of document based data exchanges to the use of web browsers.

Given the high number of data exchanges that takes place today between transmission system operators and their counterparties in the different member states, it is not realistic to implement, test and convert all parties to one solution for data exchanges in a 12-month time.

The following approach is proposed in order to meet the requirement of the Framework Guideline to **remove potential barriers** for free gas flow in EU member states due to data exchange technology:

- Transmission system operators (and parties operating on behalf of transmission system operators) shall implement the common data exchange solution that is described in the Regulation within the imposed 12 month time frame.
- Counterparties who need to communicate with transmission system operators that do not support their existing communication protocol shall implement the common data

exchange protocol to exchange data with those transmission system operators.

Exception to the implementation schedule shall be allowed in the following cases:

- Counterparties of transmission system operators can still continue to communicate with these transmission system operators after the 12 month implementation time period with the existing solution in place, as long as that solution meets the communication requirements for the business processes of the corresponding Network Codes and, as long as both parties agree to use that solution for data exchange.
- Data exchanges that are out of scope of the network codes or other EU regulations can be agreed bilaterally by both parties (e.g. meteorological data that are exchanged between meteo-offices and transmission system operators to transmit forecasted and recorded meteorological data).

However, exceptions should only be used for a shortest period of time as possible and will only be allowed with approval of the national regulatory authorities

Technology evolution (Art. 26):

Since IT technology is in a constant evolution, ENTSG will follow up changes and evolutions in IT technology for data exchange and take appropriate initiatives. If required a public consultation involving all stakeholders shall be organised to present the alternative solutions based on a cost-benefit analysis and to collect information.

In case ENTSG identifies that there is a merit in evolving the common data exchange solutions defined under the Regulation, ENTSG shall submit a proposal to ACER containing the amendment, the rationale and the possible cost-benefit analysis.

Development process for data exchange requirements related to regulations developed under Regulation (EC) No. 715/2009 (Art. 27):

This article describes the role of ENTSG related to the development process for data exchange requirements for business processes related to regulations developed under Regulation (EC) No. 715/2009.

ENTSG proposes to develop in line with Regulation (EC) No. 715/2009 a common network operation tool (CNOT) to define an open and transparent development process based on the development of Business requirement specifications for these data exchange requirements and to maintain all detailed information related to data exchange requirements. All relevant information shall be made available on ENTSG's website.

Business requirement specification

The business requirements specification BRS describes in a top down approach the different components of the business process, based on the related network code. The outcome is a detailed description of the whole business process, including a detailed data format description of the exchanged information between the different actors for each step in the

process. This document can be used as a reference by all the concerned parties to adapt their IT systems for the implementation of the corresponding network code.

Maintenance of data exchange requirements:

Data exchange and Business requirements will change over time. These changes will have an impact on the information and data formats that need to be exchanged.

> Questions for Public Consultations

- Do you agree with the proposed rules for data exchange in the Regulation?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).
- Do you agree with the approach of the initial assessment to define the data exchange solution?
 - Yes.
 - Yes, but with minor refinements (as described in section B of the Supporting Document).
 - No (as described in section B of the Supporting Document).

ANNEX A1 – Technical evaluation - protocols for document based data exchange
Timing & security criteria

Technology Category	Driver	AS2	AS4	ebMS v3 Core	Comments
Timing	Real-time delivery of information	Asynchronous messaging protocol, MDNs can be exchanged synchronously	AS4 profile is limited to asynchronous communication for business responses; receipts and errors can be exchanged synchronously, similar to Push and Pull and different combination of	Sync and Asynch supported, also for business messages	
Supported MEP (Message Exchange Pattern)					
Security	Encryption of message (envelope + payload)	3des/certificates	ws-security/certificates	Push and Pull and different combination of them	
	Signature of message (envelope + payload)	sha1	ws-security (username-token or #509)	ws-security	certificates are preferred above username password
	Non repudiation [Proof of Receipt]	MDN	Yes	Yes	
	Acknowledgement of receipt	Yes	Yes	Yes	
	Clarification				
	The protocol has to return to a correct state in case of communication problems (eg by roll back). Systems should allow configurations whereby redundant systems are installed and failover can take place at Sender or Receiver side. It is the sender's responsibility to check for the correct delivery of the data (eg by ACK confirmation, MDN,...)				
	Fault tolerance				
	Identification of Participants (Company Identification, IT System Identification)	Basic system identifiers	Yes (ebMS header has rich metadata including From and To party, service, action, correlation and	Yes (ebMS header has rich metadata including From and To party, service, action, correlation and conversation information	
	At-Lease-Once Message delivery by a recipient	Current implementations of AS2 do not provide a standard method to prevent the same message (ie-transmitted by the initial sender) from reaching back-end business applications at the initial receiver; there is an extension called AS-Reliability which is not yet standardized and not supported by all AS2	Provided by AS4 feature which provides retries and duplicate elimination. AS4 feature is similar to functionality in ebMS 2.0. (configurable)	Yes (multiple options)	

ANNEX A2 – Technical evaluation - protocols for document based data exchange
Technical Payload and traceability criteria

Technology Category	Driver	AS2	AS4	ebMS v3 Core	Comments
Technical	Run over the Internet	Yes	Yes	Yes	
	Transport Protocol	Yes	Yes	Yes	
	Encryption Supported	Yes	Yes	Yes	
	Ping/Pong ("keep alive" status message)	send zero content msg	send zero content msg	Yes	
	Messaging Sequencing NOT A CRITERIA FOR EVALUATION	No	No	Yes	requires more complicated processing (useful?) Allows to send multiple or separate messages and a processing priority
	Duplication Detection				
	Agnostic to the type of information carried	Yes	Yes	Yes	
	Support for Multiple payloads transmitted (e.g. binary and XML)	Yes	Yes	Yes	all data files related to the same subject in one interchange is preferred
	Compression	yes	Yes	Yes	
	Messaging Bundling	yes	yes	yes	multiple small messages in one interchange - NOT DESIRED FOR REASON
Traceability	Size of document payload	less overhead	Product dependent, no limit in protocol	Note: Tested up to 50MB	no difference between solutions
	Large Payload Support		No (but multiple options in ebMS3 Part 2, Advanced Features)	No (but multiple options in ebMS3 Part 2, Advanced Features)	
	Payload Encryption	yes	Yes	Yes	
	Payload Signing	yes	Yes	Yes	preferred way - to be discussed during technical
	Status of the exchange must be traceable (Document Exchange, Information Exchange, Interactive Exchange)	yes	Yes	Yes	
	Clarification Logging on both sides (sender/receiver) of the data that are exchanged, content and date/time of transmission (sent/received)				

ANNEX A3 – Technical evaluation - protocols for document based data exchange
Risk criteria

Risk		AS2	AS4	ebMS v3 Core	EFET
Category	Driver				
Scalability	Implementation or alternative solution for disconnected small use(s) (PULL function)	no	AS4 profile is not specifically designed for DTEs	Yes (pull feature added)	
	Solutions must be able to satisfy small scale setups but also very high volume information exchanges.		No limitations in protocol that prevent this. Products can use active/active clustering for horizontal scalability (adding extra servers, processor cores etc.). In some products the scalability is determined	As in AS4	
Products	System or solution has to be able to grow Cost to increase capacity, ease etc...	As in AS4	See separate document	See separate document AS4 is the most widely implemented profile of ebMS3	
	Ready to use solutions available on the market - Hardware based solution - Software based solution	Very mature technology with many implementations	Interop services will be provided in 2013. Implementation is mostly dependent on product rather than protocol		
Cost	Implementation & testing Interop testing	Commercial contomance and interop testing services available. Implementation is mostly dependent on product rather than protocol	Interop services will be provided in 2013. Implementation is mostly dependent on product rather than protocol		
	Maintenance	Mature technology, some maintenance work in ETF	Actively maintained by OASIS ebXML Messaging TC (I am a member of this TC)	Actively maintained by OASIS ebXML Messaging TC (I am a member of this TC)	
	Protocol Support	Protocol designed in the late nineties using then current technology	based on webservice	New protocol based on state of the art underlying technology and standards	
	Life cycle - expected lifetime				