27 November 2018

Note: New drafting in plain text; amendments within existing definitions/sections are tracked.

CODE MODIFICATION A091 and A093
INTRODUCTION OF RNG ENTRY POINTS

The Code of Operations shall be amended as follows to give effect to Code Modification A091 and A093.

Part A (*Definitions*)

The following new definitions shall be incorporated in Part A (*Definitions and Interpretations*) of the Code of Operations in alphabetical order.

New definitions

"**Delivery Facility Operator**" means the operator for the time being of a RNG Delivery Facility.

> **"Renewable Natural Gas"** or **"RNG"** is a fuel most commonly produced by anaerobic digestion of biodegradable matter and which is (or will be) prior to such gas being tendered for delivery to the Transportation System purified and upgraded to meet the applicable Gas Quality Specification~~.~~;

"**RNG Delivery Facility**" *means the plant and equipment constructed and/or installed immediately upstream of the Transportation System where quality parameters are measured and controlled and from which Renewable Gas which meets the Gas Quality Specification may be delivered to the Transportation System.*

"**RNG Entry Point**" means an Entry Point which is connected at the Connected System Point to a RNG Delivery Facility.

The following existing definitions in Part A (*Definitions and Interpretation*) shall be amended as follows:

Existing Definitions

The definition of "**Connected System**" shall be amended as follows:

> "means a transportation system and / or a RNG Delivery Facility physically connected to the Transportation System including, for the avoidance of doubt, any transportation systems or facilities upstream or downstream of the Transportation System which may not have been constructed or be in operation at the coming into force of this Code but excluding an~~but~~ Interconnected System. "

The definition of "**Connected System Operator**" shall be amended as follows:

> "means the operator of a Connected System and shall include for the avoidance of doubt the operator of a RNG Delivery Facility;"

The definition of "**Entry Point**" shall be amended by adding the following at the end of the existing definition:

> "*references to an Entry Point shall include a reference to an RNG Entry Point*."

The definition of "**Entry Capacity**" shall be amended as follows: " capacity at an Entry Point to the transmission system or at an RNG Entry Point required to take delivery of Natural Gas to the Transportation System and shall, save where the context otherwise requires exclude IP Entry Capacity".

The definition of "Natural Gas" shall be deleted and the following definition substituted for it:

> **""Natural Gas"** means any gas derived from natural strata (whether or not it has been subjected to liquification or any other process or treatment) and in this Code reference to natural gas may also be construed as including, where the Commission considers it appropriate and where, in the opinion of the Commission, such gas may be technically and safely injected into and transported through, the natural gas system, biogas, gas from biomass and other types of gas.**"**

Part D (*Nominations and Allocations*)

Amend Section 2.5.1 by adding the following:

"If there is an Allocable Quantity at an Entry Point for a Day on which there are no Shipper's Entry Nomination(s) at that Entry Point for that Day, the Allocable Quantity shall be allocated among all Shippers which are Registered Shippers at the Entry Point on that Day pro rata to the Shipper's Active Entry Capacity at that Entry Point and where all Shippers Active Entry Capacity is zero, the Allocable Quantity shall be allocated among such Shippers in equal shares.

Amend Part D (*Nominations, Allocations and NDM Supply Point Reconciliation)* Section 2.7.3(v), Formula as follows:

NDM = (CC + RNG) – (DS + LDM + DM)

and add the following to the legend:

RNG = the quantity of Natural Gas (in kWh) metered as delivered to the Transportation System at an RNG Entry Point downstream of the ~~Citygate~~city gate meters.

Part E (*Balancing and Shrinkage*)

Balancing

The table in Section 1.7.2 shall be amended by including the following:

RNG Entry	1.5%

The formula in Section 1.7.4 shall be amended by adding "*+ 1.5% of RNG_{al}*"

The legend to Section 1.7.4 shall be amended by including the following:

"*RNG_{al} means the Final Entry Allocation at each RNG Entry Point for a Shipper*".

Section 2.4.1 shall be amended by:

(a) deleting "." at the end of Section 2.4.1(c) and inserting "; and"

(b) including the following new sub-paragraph (d)
"(d) Shippers which are Registered Shippers at a RNG Entry Point shall be treated as Shippers on the Sub-Sea and Ireland Transmission System for the purpose of this Section 2.4.5."

Part G (*Technical*)

Amend Part G (*Technical*) Section 1 as follows:

1.1.1 Natural Gas delivered to, or tendered for delivery at, an IP Entry Point or an Entry Point shall (notwithstanding the provisions of any Interconnection Agreement or CSA) comply with the specification for Natural Gas entering the Transportation System as outlined in Appendix 1 ("**Entry Specification**"). A CSA may specify additional gas quality parameters (which may for the avoidance of doubt be sub-sets of the parameters set out in Appendix 1) and associated limits in respect of such parameters to apply at an individual RNG Entry Point or a category of RNG Entry Point(s) in which case the Gas Quality Specification in respect of such RNG Entry Points shall include gas quality parameters so specified in addition to the parameters set out in Schedule 1).[1] ~~provided however w~~Where an Interconnection Agreement or a CSA in respect of any IP Entry Point, Entry Point or Bi-Directional CSP provides for a gas quality specification which is more restrictive than that outlined in Appendix 1 then the Entry Specification with respect to such IP Entry Point, Entry Point or Bi-

[1] Explanatory Note: GNI expects to undertake an assessment to consider the implications for the Transportation System of the introduction of RNG, any such assessment may indicate additional parameters/limits depending on the nature, source of such renewable Natural Gas.

Directional CSP shall be as specified in the applicable Interconnection Agreement, or CSA as notified by the Transporter to Shippers.

Amend Section 1.1.4 by inserting on the second line after "at an Entry Point" the words "other than an RNG Entry Point" and adding at the end of Section 1.1.4 "provisions for the monitoring of the quality of Natural Gas delivered to or tendered for delivery at an RNG Entry Point may be included in any applicable CSA."

Measurement provisions;

Amend Part G (*Technical*) Section 3.1.4 as follows:

3.1.4 Each Shipper acknowledges that the volume, quantity and Delivery Characteristics of Natural Gas which it delivers to, or tenders for delivery to the Transportation System at, an IP Entry Point or at an Entry Point (by Shippers in aggregate) ~~to the requirements at an IP Entry Point~~ including as set out in any applicable Interconnection Agreement, ~~Transportation System,~~or CSA and the compliance or non-compliance with the applicable Entry Point Requirements or Entry Specification in respect thereof, shall be established in accordance with the Natural Gas Emergency Plan and/or the Procedure for the Monitoring and Management of Gas Quality and/or the procedures and standards for monitoring and management of gas quality as provided for in any applicable CSA at an RNG Entry Point and subject thereto by the Transporter and the Adjacent TSO (in accordance with the Interconnection Agreement) or Upstream Operator or Connected System Operator (pursuant to the Entry Point Requirements set out in Part H (*Operations*) Section 3.1 (*Entry Point Requirements*) or Section 5.2 (*Bi-Directional CSP Requirements*)) as the case may be in accordance with the applicable Measurement Provisions at the IP Entry Point or Entry Point and by means of the Measurement Equipment, and each Shipper shall be bound (for the purposes of this Code) by what is so established.

Amend Part G (*Technical*) by:

(i) deleting the existing Appendix 1 and substituting the attached Appendix 1 for it;

(ii) deleting the existing Appendix 2 and substituting the attached Appendix 2 for it.

Part H (*Operations*)

The following new Section 3.1.10 shall be included:

"The Transporter shall be entitled to refuse to accept quantities of Natural Gas tendered for delivery at an Entry Point on a Day on which there are no Registered Shippers at the Entry Point."

The following new Section 3.2 (which Section 3.2 is currently designated "not used") as follows:

3.2 **RNG Entry Points**

3.2.1 RNG Entry Points may be connected to the Transmission System or may be connected to the Distribution System.

3.2.2 Natural gas shall be deemed to enter the Transportation System at a RNG Entry Point.

3.2.3 The Transporter will not enter into any OBAs at RNG Entry Points.

3.2.4 The Transporter does not anticipate the development of offtake profile notices at RNG Entry Points. The Transporter may enter into agreements with the Delivery Facility Operator in connection with the determination of the quantities of Natural Gas to be delivered to the Transportation System at an RNG Entry Point for any Day.

3.2.5 The provisions of Section 3.8 (*Administrative Procedures at an Entry Point*) shall not apply to RNG Entry Points.

The following new Section 3.7.6 shall be included after Section 3.7.5:

"3.7.6 The Transporter may where technically and operationally feasible and in order to facilitate new RNG Entry Point(s) enter into such arrangements as the Transporter acting as a Reasonable and Prudent Operator considers appropriate to facilitate the commissioning of any proposed new RNG Entry Point."

APPENDIX 1
QUALITY SPECIFICATION OF NATURAL GAS AT IP ENTRY POINTS AND ENTRY POINTS

Parameter	**Entry**
Total Sulphur	< 50mg/m^3 (including H_2S)
Oxygen	≤ 0.2 mol% *See biomethane notes.
Carbon Dioxide	≤ 2.5 mol % See Note 1 of CER/09/035
Hydrogen Sulphide	≤ 5mg/m^3
Water Content	≤ 50mg/m^3
Gross Calorific Value (Real Gross Dry)	36.9 - 42.3 MJ/m^3
Wobbe Index (Real Gross Dry)	47.2 – 51.41 MJ/m^3
Contaminants & Odour	See Notes 2 and 3 of CER/09/035
Incomplete Combustion Factor	< 0.48
Delivery Temperature	1 ^{o}C to 38 ^{o}C
Hydrogen	< 0.1 mol%
Soot Index	< 0.60
Organo Halides	< 1.5 mg/m^3
Radioactivity	< 5 Becquerels/g
Ethane	< 12 mol%
Nitrogen	≤ 5 mol %
Hydrocarbon Dewpoint	≤ - 2 ^{o}C up to 85 barg

Note 1 The CO2 limit of 2.5% will not be considered breached if the total inerts (including CO2) in the gas is less than 8% where:
"inerts" in natural gas means carbon dioxide(CO2), nitrogen(N2), helium(He), argon(Ar), and oxygen(O2).

Note 2 Natural Gas shall not contain solid liquid or gaseous material which may interfere with the integrity or operation of pipes or any Natural Gas appliance which a consumer or transporter could reasonably be expected to operate. With respect to Mist, Dust,
Liquid, gas delivered shall be technically free in accordance with BS3156 11.0 [1998].

Note 3 Natural Gas shall have no odour that might contravene the obligation of theTransporter to transmit gas which possesses a distinctive and characteristic odour.
Where the Transporter requires gas to be odourised, the gas shall be odourised in accordance with the following specification:
- Odour intensity of 2 olfactory degrees on the SALES Scale (Ref-IGE/SR/16/1989), or
- such other specification determined by the Transporter acting as an RPO

Emergency Gas Quality Specification
In the event of an Emergency, and at the sole discretion of the National Gas Emergency
Manager, gas outside of the Entry Specification may be admitted to the system. Without
prejudice to the generality of this, the emergency limits as outlined in the [Gas Safety
(Management) Regulations 1996 of the UK (UK Statutory Instrument 1996 No. 551)] may be adopted by the Transporter.

Biomethane Notes

1. Oxygen content for gas derived from renewable gas produced from biomethane facilities at an RNG Entry Point connected to the Distribution System shall be up to < 1 mol% where there is provision for automatic discontinuation of gas flows for non-compliance with the applicable gas quality specification (Code Modification 3).

2. The CSA in respect of any RNG Delivery Facility may specify additional gas quality parameters (which may for avoidance of doubt be subsets of the parameters set out above) and associated limits in respect of such parameters to apply at the individual RNG Entry Point or category of RNG Entry Point in which case the gas quality parameters so specified shall (subject to Biomethane Note 1 above) apply at such RNG Entry Point(s) in addition to the parameters set out above. [***Note: Refer Part G (Technical) Section 1.1.1***.]

APPENDIX 2

QUALITY SPECIFICATION OF NATURAL GAS AT OFFTAKE POINTS OR CSEP

(A) Gas Combustion Characteristics

Type of Gas	2nd Family Group H
Wobbe Index	45.7 to 54.7MJ /m^3 (Real Gross Dry)

(B) Upper Limits of Natural Gas Impurities

Hydrogen Sulphide Content	Not more than 5mg/m^3
Total Sulphur Content	Not more than 50mg/m^3
Oxygen Content	(i) Not more than 0.2% (molar) (for Offtake Points and CSEP's connected to the Transmission System) ~~(i)~~(ii) Not more than 1.0% (molar) for Offtake Points connected to the Distribution System.
Contaminants	Natural Gas shall not contain solid matter which would have a material adverse impact on the ability to use Natural Gas at an Offtake Point.

(C) Reference Conditions

All measurements at 15ºCelsius and 101.325kPa.