

# Quality and Delivery Specifications

1 October 2023

Natural Gas received, transported and redelivered in the Danish Gas System under a Capacity Agreement or storage agreement shall at all times comply with the Danish gas regulation (Gas-sikkerhedsloven) and the following Quality Specifications.

## 1. Quality Specifications

Wobbe Index: During normal operation the Wobbe Index for the Natural Gas shall not be lower than 50.76 MJ/m<sup>3</sup> or higher than 55.8 MJ/m<sup>3</sup>. During abnormal state of operation, the Wobbe Index for the Natural Gas shall not be lower than 50.04 MJ/m<sup>3</sup> or higher than 55.8 MJ/m<sup>3</sup> and requires a preparedness plan that is approved by The Danish Safety Technology Authority (Sikkerhedsstyrelsen). A preparedness plan for the Entry Point at Ellund has been approved.

Relative Density: The Relative Density of the Natural Gas shall not be lower than 0.555 or higher than 0.7.

CO<sub>2</sub>: The CO<sub>2</sub> content of the Natural Gas shall not exceed 2.5 mol-%.

O<sub>2</sub>: The O<sub>2</sub> content of the Natural Gas shall not exceed 0.1 mol-% on a 24-hour basis for the Entry Points, the Transit Points and the Storage Points. The O<sub>2</sub> content of the Natural Gas/Bio-methane shall not exceed 0.5 mol-% for the Transition Points and the Metering Points for Bio-methane.

H<sub>2</sub>S and COS: The content of H<sub>2</sub>S + COS in the Natural Gas measured as sulphur shall not exceed 5 mg/m<sup>3</sup>. However, under extraordinary operating conditions in relation to the Entry Points, the Transit Points and the Storage Points, the H<sub>2</sub>S + COS content may for a period of maximum 2 hours constitute up to 10 mg/m<sup>3</sup>, although not more than 5 mg/m<sup>3</sup> on a 24-hour basis.

Mercaptans: The mercaptans content of the Natural Gas measured as sulphur shall not exceed 6 mg/m<sup>3</sup>.

Total sulphur content: The total sulphur content shall not exceed 30 mg/m<sup>3</sup>.

Water dew point: The water dew point of the Natural Gas shall not exceed minus 8 °C at any pressure up to 70 bar absolute pressure.

Hydrate formation: The Natural Gas must not form hydrates at temperatures of minus 8 °C or higher at any pressure up to 70 bar absolute pressure.

Hydrocarbon dew point: The Natural Gas must not form liquid hydrocarbons at temperatures of minus 2 °C or higher at any pressure up to 70 bar absolute pressure.

Dust and liquids: The Natural Gas shall be technically free of gaseous, solid or liquid substances to the extent that this may involve a risk of blocking and malfunction or corrosion of ordinary

gas installations and standard gas equipment. This provision does not apply to such liquid formation that occasionally occurs in Natural Gas in the form of very small droplets and that cannot be removed from it.

Odourisation: The Natural Gas shall be delivered unodourised at the Entry Point. Odourisation of the Natural Gas shall take place at the Transition Point, when the Natural Gas is delivered from the Transmission System to the Distribution Network. Traces of odourant up to 1 mg/m<sup>3</sup> may be present in gas in the Transmission System due to reverse flow from the Distribution Network at the Transition Point. However, under extraordinary operating conditions in relation to the reverse flow facilities increased levels up to 2 mg/m<sup>3</sup> for a period of up to 24 hours may occur.

Other components and contaminants: The Natural Gas shall not contain other components and/or contaminants to an extent which may imply that it cannot be transported, stored and/or marketed without further adjustment of the quality or treatment of the Natural Gas.

The gas quality of Renewable Gas shall fulfil all requirements from the Danish gas regulation regarding biomethane and E-methane.

## **2. Delivery specifications**

Temperature: The temperature of the Natural Gas during normal operation shall be no lower than 0 °C and no higher than 50 °C; however, under extraordinary operating conditions or due to bona fide technical circumstances, the temperature of the Natural Gas may be as low as minus 10 °C for periods of up to two hours.

## **3. Revision of Appendix 1**

This Appendix 1 is subject to regular revision by Energinet, Gas Storage Denmark and the Distribution Company in step with changes in the General Terms and Conditions for Gas Transport and/or changes in the quality and delivery specifications typically applying in Europe.