



Open Season for a **CO₂ transport infrastructure in Dunkirk**

7th of February 2023



Open Season for the construction of a CO₂ transport infrastructure in the port area of Dunkirk

Carbon Dioxide Specifications Proposal

Disclaimer

The CO₂ specifications presented in this document (the “**CO₂ Specifications Proposal**”) reflect the best knowledge available at the time of publication. These CO₂ quality specifications are subject to change, depending on the results of this market consultation, the evolution of treatment techniques, and possible publications or updates of standards on CO₂ transport infrastructures. The information contained herein reflects the current viewpoint of GRTgaz S.A. and is for information purposes only. It does not constitute any commitment on the part of GRTgaz S.A. and should not be viewed as giving rise to any contractual relationship whatsoever between GRTgaz S.A. and any interested party.

Introduction

CO2 specifications exist in the same way as for the transport of natural gas. These are needed to ensure the safe operation and interoperability of future CO2 transport infrastructure.

The purpose of these specifications, on the one hand, is to preserve the integrity of transport structures with regard to the risks of chemical reactions and changes to the physical characteristics of their constituent materials; and, on the other, to guarantee the transport to other CO2 infrastructures in accordance with the final requirements.

Any CO2 introduced into the CO2 transport network proposed in this Open Season must therefore comply with specifications in terms of:

- CO2 quality (composition) ;
- Pressure and temperature conditions.

CO2 quality

CO2 quality specifications will apply to the quantities of CO2 that will be injected into the transport infrastructure as well as to deliveries to export points, adjacent networks and CO2 usage sites.

These specifications are based on existing CO2 transport standards as well as published CO2 quality specifications of CO2 storage and transport projects.

Composés	Unités	Spécifications
CO ₂	% mol	> 95
H ₂ O	ppm mol	< 40
N ₂	% mol	< 2
CH ₄	% mol	< 1
H ₂	% mol	< 0,75
Ar	% mol	< 0,4
CO	ppm mol	< 750
O ₂	ppm mol	< 40
Incondensables (N ₂ +CH ₄ +H ₂ +Ar+CO+O ₂)	% mol	< 4
Total aliphatic hydrocarbons (C ₂ -C ₁₀)	ppm mol	< 1200
Total aromatic hydrocarbons (C ₆ -C ₁₀ , incl. BTEX)	ppm mol	< 0,1
H ₂ S	ppm mol	< 9
SO ₃	ppm mol	<0,1
SO _x	ppm mol	<10
Total sulfur (COS, DMS, H ₂ S, SO _x , mercaptans)	ppm mol	<20
NO _x	ppm mol	<10
Dew point (all liquids)	°C (on the whole operating pressure range)	< -10°C
NH ₃	ppm mol	< 10
Formaldehyde (CH ₂ O)	ppm mol	< 20
Acetaldehyde (C ₂ H ₄ O)	ppm mol	< 20

Ethanol	ppm mol	< 20
Methanol	ppm mol	< 620
Total volatile organic compounds Excl. methane, total aliphatic HC C ₂ to C ₁₀ , methanol, ethanol and aldehydes	ppm mol	< 10
Acides carboxyliques et amides totaux	ppm mol	< 1
Composés phosphorés totaux	ppm mol	< 1
HCN	ppm mol	< 2
Mercure (Hg)	ppm mol	< 0,03
Cadmium (Cd) + Thallium (TI)	ppm mol	<0,03
Amines	ppm mol	< 10

Summary table of CO2 quality recommendations

Pressure and temperature conditions

The operating conditions of the infrastructure, and in particular the minimum and maximum pressures and temperatures, will be defined in subsequent phases of the Open Season. This will be done in consultation with participants and according to the technical specificities provided by the emitters and the CO2 export or usage sites, and depending on the environment crossed.

At this stage, GRTgaz considers a transmission infrastructure for CO2 injected and transported in its gaseous phase.

As an indication and as a preliminary step, GRTgaz plans to study a maximum operating pressure for the infrastructure of around thirty bars. This maximum operating pressure will be assessed in greater detail depending on the environment and the system's operating conditions, which will be defined in the subsequent stages of the Open Season.