RECOMMENDATIONS

TO TRANSMISSION SYSTEM OPERATORS ON THEIR TECHNICAL COOPERATION WITH DISTRIBUTION SYSTEM OPERATORS





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1 SUBJECT MATTER AND SCOPE

The purpose of this document is to provide recommendations to transmission system operators (TSOs) for the technical cooperation between TSOs and connected distribution system operators (DSOs).

The relationship between TSOs and DSOs forms the cornerstone of a secure, efficient, resilient and sustainable gas network. TSOs, together with DSOs, operating over 2,000,000 km of transmission and distribution grids in Europe and their direct connection to end-users, are indispensable collaborators in the energy ecosystem. DSOs and TSOs shape a resilient and future-proof gas infrastructure. Looking ahead, continued cooperation between TSOs and DSOs will support the timely decarbonization of approximately 90 million residential, commercial and industrial end-users. This strong collaboration supports the integration of renewable and low-carbon gases. By leveraging their combined strengths, TSOs and DSOs can address emerging challenges, create value for stakeholders, and add considerable flexibility to the European energy system. This document reaffirms the commitment to strengthening this partnership, recognizing DSOs as key contributors to the energy transition and vital collaborators in shaping the future of the joint European gas network.

The recommendations are adopted in accordance with Article 26, paragraph 3(d) Regulation (EC) No 2024/1789, which requires ENTSOG to adopt "recommendations to TSOs on their technical cooperation with distribution system operators and hydrogen network operators". The recommendations to TSOs on their technical cooperation with hydrogen network operators will be developed in the future as there is limited number of hydrogen network operators.

This document fulfils this requirement. These recommendations are not legally binding and the use of the word "should" throughout the document shall not be interpreted to suggest otherwise. TSOs and DSOs can jointly agree to deviate from the recommendations described therein.

Furthermore, one of the key findings from the development of this document is that the practices for technical cooperation between TSOs and DSOs vary significantly across Europe. This variation is attributed to several factors, including differences in legislation, the sizes of the TSOs and DSOs, and legacy practices that have proven to be the most efficient in their respective contexts. However, TSOs and DSOs are encouraged to follow the recommendations especially in cases when some of the below mentioned aspects of their technical cooperation are not yet established and/or formalised.

On the basis of national specificities concerning roles and responsibilities duly covered by legislation, it could be possible that other organisations fulfil roles, which in other cases are fulfilled by TSOs and/or DSOs themselves, namely a Market Area Manager or a Distribution Area Manager. This differentiation is left out in the following document. Even if in some countries these entities play roles that in other countries are played by TSOs or DSOs, the document still refers to these entities as TSO and DSO for simplification purpose.

For the development of this document, TSOs members and four EU associations representing DSOs (EUROGAS, CEDEC, GEODE, and GD4S) were consulted by ENTSOG.

2 KEY ASPECTS OF THE TECHNICAL COOPERATION BETWEEN TSOs AND DSOs

The TSOs should ensure that the following points are covered in respect of entry and exit points with the DSOs (hereafter "connection points"):







Rules for flow control

The TSOs and the DSOs at connection points should ensure that technical procedures and conditions (for example, the steering of the flow control unit, in cases where it's technically applicable) are established for the appropriate gas flow across the connection points.

Measurement principles for gas quantity and quality in case physical equipment is in place at connection points

In respect of the measurement principles for volume, energy, and gas quality, the TSOs and DSOs at connection points should ensure that:

- a) The details of the measurement standards applicable at the connection points are established.
- b) The TSO or DSO which is responsible for the installation, operation and maintenance of the measurement equipment is identified. This operator should make information and data (preliminary agreed) in respect of the measurement of gas flows at the connection points available to the other connected operator, in a timely manner and at a frequency specified.
- c) The procedure for inspections, calibrations, and expertise of gas measurement equipment is established.
- **d)** The procedures and measures that apply between the TSOs and DSOs in the event of failures and damages to metering devices.

The installation, operation, and maintenance of measurement equipment at connection points should meet the national and/or European requirements of respective technical regulations and standards.

The measurement principles at the connection points should include:

- a) the procedures and measures that may be used in case of the main measurement and analysis equipment failure;
- **b)** the relevant gas quality parameters, volume and energy that are measured, as well as the range and the maximum permissible error, the frequency of measurements, the units and conversion factors used;
- c) the procedures and methods that is used to calculate those parameters which could not be measured directly;
- **d)** a description of the method of calculation of energy flowing in respect of the maximum permissible error or uncertainty in the determination;
- e) the way data, including frequency and content, is provided, exchanged, and validated in respect of the measured parameters, such as gas quantity and quality, pressure, temperature;
- f) the specific list of signals and alarms to be provided by the operator of the measurement equipment to the connected operator;
- g) the method of determining a correction to a measurement and any subsequent procedures that may be necessary in a temporary situation where the data is missing or probably in error;
- h) the procedures that apply between the TSOs and DSOs for:
 - i. access to the measurement facility;
 - ii. additional verifications and inspections of measurement facility;
 - iii. modification of the measurement facility;
 - iv. attendance during inspections, calibration and maintenance work at the measurement facility.

Gas quality parameters at connection points

- a) The TSOs and DSOs should agree on the exchange of relevant gas quality parameters at connection points, particularly the Gross Calorific Value and Wobbe Index, and other parameters (e.g. water dew point, O₂, H₂), if required by regulation.
- b) The TSOs and DSOs should agree procedures in case gas quality parameters do not comply with expected values. It is recommended to prioritize the safety and continuity of gas flows to the DSOs as well as secure clarification of roles allocation as part of the agreed procedures.



Gas odorisation requirements

Gas entering or exiting the DSO's network should apply odorisation requirements and responsibilities in accordance with current regulatory and technical documents in a Member State.

The TSOs and DSOs should set the mechanisms necessary to ensure appropriate odorisation of the gas flow in accordance with the rules established within their Member State.



Gas pressure

The TSOs and DSOs should define the minimum and maximum required gas pressure at connection points and establish procedures for sharing gas pressure information.

The TSOs and DSOs should agree on measures and procedures in case gas pressure at connection points is different from the defined values.



Gas flows measurement range and gas temperatures

The TSOs and DSOs should define the technical specifications regarding the design and operation of the measurement and pressure reduction stations at connection points according to their local needs and considering the legislation in place.



Common set of units

The TSOs and DSOs should agree on a common set of units to be used in communications, agreements, contracts, other documentation for the parameters such as pressure, temperature, volume, gross calorific value, energy, Wobbe-index, and/or other that are considered relevant. Whenever TSOs communicate data on volume, GCV, energy, Wobbe index, or other relevant parameters, the TSOs and DSOs should specify the reference conditions under which these values were calculated.



Safety requirements

The TSOs and DSOs at connection points should follow national and European safety requirements of hydrocarbon transport pipelines and equipment. Furthermore, TSOs and DSOs should coordinate with each other and continuously improve their safety measures and learn best practices to ensure the highest levels of safety.



Gas pressure regulating stations

EN 12186:2015 "Gas infrastructure – Gas pressure regulating stations for transmission and distribution – Functional requirements" can be applied for planned (new) gas pressure regulating stations. The TSOs and DSOs should coordinate in advance regarding the equipment to be used and act as considerate operators.



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Protection of metering equipment

The TSOs and DSOs should ensure that the owner of metering equipment in cooperation with connected party establishes procedures to protect the metering devices from interference by unauthorized persons.

Operational changes in gas demand of network users connected to DSOs

The TSO and DSOs should establish procedures for exchanging information about expected significant changes in the gas demand during a day of DSO network users. This procedure should be established as needed, tailored to specific regional or local situations and technical conditions, ensuring it is fit for purpose. This will help TSOs, on operational level, to prepare their networks for changes in gas flow patterns and ensure more efficient operations. In addition, TSOs and DSOs can define additional information about expected daily gas demand and potential peak offtakes if deemed necessary.

Communication procedures in case of an event causing interruption

The TSOs and DSOs should ensure that communication procedures which facilitate communication in case of an event causing interruption of gas flows via connection points are established. The TSOs and DSOs should perform all necessary measures to eliminate any accident or failure, with the aim to quickly restore gas flows.



3 REVERSE FLOWS

The TSOs and DSOs should ensure that the points covered in other chapters of this document can be applied to flows from DSOs to TSOs, when relevant.

- The TSOs and DSOs should work together to enable relevant reverse flows or to ensure the integration of the distribution system through alternative means (e.g. such as market measures), equivalent in effect, to facilitate the market integration of renewable gas and low-carbon gas.
- The TSOs and DSOs should closely collaborate when designing and establishing technical solutions for gas flows from the DSOs to the TSOs. The parties should specify the technical requirements of the project in detail. Below are some examples of information that may be included:
 - Minimum gas pressure requirements and conditions for the TSO network to ensure effective transportation.
 - Technical equipment requirements for increasing pressure, including installation locations and the operator responsible for its management.
 - Gas treatment facilities (including deodorization).
 - Gas flow metering facilities.
 - Gas quality monitoring facilities.
 - Means of power supply under normal and emergency power supply conditions.



4 EXCHANGE OF INFORMATION ON INFRASTRUCTURE

The Directive (EC) No 2024/1788 provides concrete cooperation rules between TSO and DSO in the chapter III on integrated network planning. Through the implementation of articles 55, 56, and 57 into national legislation until 5 August 2026, the framework of future planning cooperation between TSO and DSO will be defined catering to the specific structures and needs of each member state.

The information exchanged should be limited and specified to the extent necessary, and relevant to the connection points between TSOs and DSOs. For example, regarding the development of renewable and low-carbon gas, information exchange should be restricted to aspects that have an impact on the connection points between TSOs and DSOs.

Furthermore, TSOs and DSOs should be able to preserve the information exchange systems in place to the extent that those systems are sufficient to meet exchange of information requirements.

It should also be noted that legislation or applicable agreements in place, in particular for commercially sensitive information, should be followed when exchanging information.





- The TSOs and DSOs should share the schematics of their networks with each other, covering areas where they are interconnected and where such schematics are beneficial to both operators.
- If it's not publicly available, the TSOs and DSOs should exchange information about existing technical capacities of gas pressure regulating stations operated by them and/or about technical capacities of the TSOs pipelines connected to the gas pressure regulating stations.
- The TSOs and DSOs should cooperate in sharing information about the capacities of significant consumers connected to DSO systems and, if available, the total capacity of connected customers.
- The TSOs and DSOs should share information about their network development plans and notify, according to defined procedures and/or national legislation, when new infrastructure is commissioned which may potentially impact capacities and gas flows regimes between TSOs and DSOs.
 - The DSOs should inform TSOs about developments of renewable gas and low-carbon gas production facilities on the DSO side, including maximum production capacity, maximum potential flows from the DSOs to TSOs, gas quality parameters of production facilities, timelines of commissioning, seasonal fluctuations.
 - The TSOs and DSOs should exchange information on location of the existing and future renewable gas and low-carbon gas facilities on the TSOs and DSOs sides which may potentially impact capacities and gas flows regimes between TSOs and DSOs.
 - The TSOs and DSOs should inform each other, according to defined procedures and/or national legislation, about changes to their infrastructure that could substantially impact capacities and gas flow regimes between the TSOs and DSOs.
- The TSOs and DSOs should inform each other about infrastructure projects (commissioned, under construction, and planned) that are technically capable of transporting natural gas blended with hydrogen.

5 MAINTENANCE WORKS

The information exchange about maintenance works should be limited and specified to the extent necessary, and which may potentially impact the connection points between TSOs and DSOs.

Furthermore, TSOs and DSOs should be able to preserve the information exchange systems in place.

- The TSOs and DSOs should exchange information about planned maintenance activities on their networks which may impact technical capacity, gas flow regimes and gas quality between TSOs and DSOs.
- The TSOs and DSOs should immediately inform each other about any unplanned maintenance activities which may impact gas flows via connection points. This should include impact on gas flow patterns, capacities, and gas quality, as well as the expected duration to complete the maintenance.
- During maintenance works that may impact gas flows between TSOs and DSOs, the TSOs or DSOs should inform each other, about technical details such as gas flow patterns, available technical capacities, and gas quality, as well as the expected duration to complete the maintenance.
- Before starting the maintenance and making changes in operations, appropriate divisions (e.g. dispatching) of the TSOs and DSOs inform each other about circumstances and measures that could affect safety, integrity or reliability of the TSOs and DSOs systems, especially in cases where such circumstances could affect the gas quantity, pressure or quality at connection points.
- The TSOs and DSOs experts involved in maintenance works should exchange in advance contacts details for fast communication and exchange of information during planning and performing maintenance works.

6 DATA EXCHANGE

The TSOs and DSOs should establish solutions for data exchange in respect of the information necessary for appropriate, reliable, and safety operations of their systems. Depending on the national procedures, the types of data exchange, the protocol, the data format and the network for data exchange between TSOs and DSOs should be agreed.

The TSOs and DSOs should ensure that the appropriate security measures in respect of data exchanges are undertaken.

7 TSOs AND DSOs COOPERATION IN CASE OF SoS EVENTS

'SoS event' – for the purpose of this document, SoS event is any event when, in a Member State, one of the crisis levels (early warning, alert, emergency) foreseen in the regulation 2017/1938 is declared.

- When the competent authority declares one of the crisis levels the TSOs and DSOs shall act according to exiting rules in their Members States in such events, including measures foreseen in preventive action plans and emergency plans if applicable.
- ▲ The TSOs and DSOs should exchange information in cases of SoS events if needed.

8 SUPPLEMENTARY DOCUMENTATION

The TSOs and DSOs may jointly establish supplementary documentation describing technical conditions for connecting with DSO's systems in interest of facilitating non-discriminatory, transparent and safety of gas flows between TSOs and DSOs.



9 FINAL PROVISIONS

- The TSOs and DSOs are encouraged to solve amicably any disputes arising out of or in connection with their activities at connection points.
- When creating this recommendation there is already a list of solutions used for technical cooperation between TSOs and DSOs (e.g. measurement, safety, data exchange, maintenance, etc). Some of these existing relationships are mandated by national law and NRAs. This document aims to support technical cooperation between TSOs and DSOs as per the Regulation (EC) No 2024/1789 and is not a basis for pan-European standardisation between TSOs and DSOs.
- These recommendations might be reviewed and modified by ENTSOG to reflect relevant circumstances and conditions in respect of technical cooperation between TSOs and DSOs.



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ENTSOG AISBL Avenue de Cortenbergh 100 | 1000 Brussels, Belgium Tel. +32 2 894 51 00

info@entsog.eu | www.entsog.eu