



STRATEGIC BUSINESS PLAN – ISO/TC 193

Executive summary

ISO/TC 193 develops international standards for terminology, quality specifications, methods of measurement, sampling, analysis and testing, including thermophysical property calculation and measurement, for:

- natural gas
- natural gas substitutes
- mixtures of natural gas with gaseous fuels (such as unconventional gases and renewable gases), and
- wet gas

in all its facets from production to delivery to all possible end users across national boundaries. Standardization of methods of analysis of Liquefied Natural Gas (LNG). Recognition of work related to natural gas in other technical committees and in liaison with these technical committees.

These international standards are supporting tools for delivery contracts between exploration companies, transportation companies, trading companies, distribution companies and industrial and individual end users. Instead of negotiating natural gas quality (e.g., caloric value), volume and measurement methods for each contract, easy reference to international standards can be made. International standards are being used to support cost-effective realization of processing installations, the liberalization of the gas markets, the energy efficiency, environment protection and safety. Furthermore, the international standards serve as supporting tool for regulations in the field of natural gas.

The presence of solids and liquids in the upstream gas industry presents additional challenges for the measurement methods used.

1 Introduction

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: [ISO](#) (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of [IEC](#) (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of [ITU](#) (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the [International Standard](#).

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its [Technical Committees](#) are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2 Business Environment of the ISO/TC

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

ISO/TC 193 develops international standards for terminology, quality specifications, methods of measurement, sampling, analysis and testing, including thermophysical property calculation and measurement, for:

- ***natural gas***
- ***natural gas substitutes***
- ***mixtures of natural gas with gaseous fuels (such as unconventional gases and renewable gases), and***
- ***wet gas***

in all its facets from production to delivery to all possible end users across national boundaries.

Standardization of methods of analysis of Liquefied Natural Gas (LNG) is also part of the work.

Recognition of work related to natural gas in other technical committees and in liaison with these technical committees is part of the environment as well.

Natural gas is easily stored and can be delivered through pipelines or liquefied and sent by ship. Gas-fired power plants can be turned on and off quickly. Gas is thus a convenient way to respond to both seasonal and short-term demand fluctuations. ¹ Furthermore, natural gas and its substitutes present an alternative to using oil-based fuels in combustion engines. It is widely used as transport fuel, for example in retrofitted diesel engines.

As opposed to for instance crude oil, natural gas is used in the condition which is as close as possible to that in which it is found. It is not formulated, refined or blended to a defined specification. Natural gas is treated to satisfy requirements of safety or engineering constraints, but in most cases this is limited to removal of water, sulfur and condensable hydrocarbons. Natural gases from different sources have different properties, such as heating value, and are not all compatible in terms of safe and efficient use on end-user appliances or applications. Since the properties differ, their accurate measurement is critical for considerations of safety, billing, transmission choices and use and this accuracy must apply throughout the ranges over which properties vary.

Main players in the natural gas market are:

- exploration and production companies
- trading companies
- transportation companies
- distribution companies
- regulatory bodies
- industrial customers
- consultancy and certification bodies
- end-users.

The major factors which may have an impact on the developments of the market are:

- liberalization of natural gas transport and delivery: more players involved, increase of trading companies, increasing need for clear standards for natural gas quality and measurement
- increasing need for reducing costs, merging of exploration companies
- increasing use of natural gas because of environmental effects and new applications
- increasing use of unconventional gases and renewable gases (biomethane, hydrogen) to reduce greenhouse gas emissions
- increasing production facilities by applying new technologies.

Efficient use of energy is necessary in order to optimize the lifetime of gas reserves. Both the environment and the economy would benefit from this. Great strides have been made towards increased efficiency, particularly in the appliance area.

Energy consumption in general has a negative impact on the environment, especially in industrial and urban areas. Increased and efficient use of natural gas and its renewable substitutes would reduce this impact. Nowadays the general tendency in most parts of the world is a reduction of the use of natural gas for households and industry. To reduce the negative impact on the environment and the climate a transition is ongoing towards the use of renewable energy (e.g., hydrogen, biomethane, wind, solar etc). Natural gas, which emits less carbon than most other fossil fuels, has a key role as a transition fuel from coal to renewable energy sources. Additionally, natural gas power generation may still be needed as back-up for variable wind and solar power. ²

¹ Source: IEA website

² Source: IEA website

2.2 Quantitative Indicators of the Business Environment

The following quantitative indicators describe the business environment to provide adequate information to support actions of the ISO/TC.

Natural gas is widely used for domestic private, commercial and industrial purposes, both as an energy carrier and as a feedstock. It accounts for more than 25% of the world's primary energy consumption³.

Exploration techniques continue to improve as that natural gas reserves have been increased significantly.

Liquefied natural gas (LNG) has become a major factor in gas sales internationally. Technology is driving down the costs of pipelined gas and LNG has become competitive with oil.

Development of marginally small fields is increasing, demanding additional cost-effective production technology and the ancillary standardization.

Following and despite the worldwide attempt to reduce the use of fossil energy sources, natural gas is expected to remain widely available and will have a solid market share for the coming decades. Eventually, it will to a large extent be replaced by biomethane and hydrogen from renewable sources.

About 32 % of the natural gas is traded. Transportation of natural gas is a relatively important factor in the costs of the product. In general, the transport of natural gas over long distances is accommodated by large pipelines and LNG terminals.⁴

While there are over a hundred countries which have natural gas reserves sufficient for commercial development, the major reserves are found in just a few countries (Iran, Russia, Qatar, USA, Australia, China⁵). Moreover, these large reserves are in many cases located at great distances from the major gas consuming areas.

Growth in LNG trade has partly overcome the geographic difficulties of distances between remote locations and major consuming areas.

Cross border transport and carriage distances remains important. The LNG share in the long-distance transport of natural gas has been growing, but disruptions to Europe's supply caused by the current geopolitical situation have spurred massive investments in liquefied natural gas terminals that will eventually allow gas to be traded much in the way oil is.

3 Benefits expected from the work of the ISO/TC

The international standards of ISO/TC 193 are supporting tools for delivery contracts between exploration companies, transportation companies, trading companies, distribution companies and industrial and individual end users. Instead of negotiating natural gas quality (e.g. caloric value) and measurement methods for each contract, easy reference to international standards can be made. International standards are being used to support cost effective realization of processing installations, the liberalization of the gas markets, the energy efficiency, environment protection and safety. Also they serve as supporting tool for regulations in the field of natural gas.

³ Source: IEA Key World Energy Statistics 2019, www.iea.org

⁴ Source: IEA website

⁵ Source: EIA report 2018, www.eia.gov/naturalgas/

4 Representation and participation in the ISO/TC

4.1 Membership

[Countries/ISO member bodies that are P and O members of the ISO committee.](#)

4.2 Analysis of the participation

The use of natural gas is made possible by the activities of producers, carriers, distributors of natural gas and manufacturers of gas appliances, all of whom recognize the significance of the end users' demands. Proper functioning of the natural gas market requires effective interaction between all parties.

The gas industry, recognizing the need for standardization, has already developed numerous national and international standards. Moreover, it is willing to give both technical and organizational support to international standardization efforts. Existing co-operative bodies may be expected to give sufficient support.

For the elaboration of a work programme regarding unconventional gases and renewable gases relevant representatives and experts will be attracted to participate in the work.

At present main representations are from natural gas transportation and distribution companies from Europe, Asia and the USA. A reinforcement of the representation from exploration companies is needed as well as representations from Australia, New Zealand and South American and African regions.

In order to improve the participation by new countries plenary meetings will be envisaged to take place in these countries.

5 Objectives of the ISO/TC and strategies for their achievement

5.1 Defined objectives of the ISO/TC

Since its creation in 1988, ISO/TC 193 developed over 60 international standards for the quality and measurement of natural gas. It is the objective of ISO/TC 193 to keep these standards up to date and to develop new standards where necessary. These standards mainly apply for treated gas (from treatment plant to end user). Until now 6 standards apply to untreated gas in the upstream area (from well to treatment plant).

Based on the considerations above, the ISO/TC has the following objectives for its future work:

- to provide standards for guidelines, methods of test and evaluation procedures which will assist in the smooth operation of international gas trade
- to provide standards for gas specification formats which will enhance safety standards and promote the development of valuable new products and uses for natural gas, like the use as vehicle fuel
- to provide standards for guidelines, methods of test and various evaluation procedures to enhance uniformity and safety in gas operations around the world
- to provide standards for gas specification formats pertinent to the liquefaction, storage and re-evaporation of LNG, connecting with those of other TCs such as ISO/TC 28
- to provide standards for gas specifications and analysis methods of unconventional gases, renewable gases and wet gas.
- to provide standards for natural gas traceability and quality requirements of reference materials
- to provide standards for a smooth (international) transaction of upstream gases
- to provide standards for sampling, analysis, testing, measurement technologies, calculation and allocation of natural gas and related medium (solid, liquid, other gases and their mixtures) in the process of natural gas exploration, development and production
- to accommodate liberalization aspects in standards
- to maintain a network (access to) experts in the field of natural gas (up- and downstream) in the industry as well as in the governmental organization

- to create a strong liaison with ISO/TC 197 Hydrogen Technologies with regard to the applicability of standards to natural gas/hydrogen blends

5.2 Identified strategies to achieve the ISO/TC's defined objectives

These ISO/TC 193 objectives will be achieved by:

- streamlining of all standardization activities for the natural gas industry
- co-ordination of the work of all parties involved
- full exchange of information
- liaison with all relevant international organizations and other ISO technical committees
- a structure with two subcommittees:
 - SC 1 "Analysis of natural gas", scope: Standardization of sampling and analysis methods and related thermophysical property calculations for: natural gas, natural gas substitutes, liquefied natural gas (LNG), mixtures of natural gas with gaseous fuels (such as unconventional gases and renewable gases), in all its facets from production to delivery to all possible end users across national boundaries;
 - SC 3 "Upstream area", scope: Standardization of sampling, analysis, testing, measurement technologies, calculation and allocation of natural gas and related medium (solid, liquid, other gases and their mixtures) in the process of natural gas exploration, development and production;and working groups directly under the TC for items not falling in the scope of these subcommittees.

Following the market developments related to the energy transition the scope of ISO/TC 193 also covers natural gas/hydrogen mixtures, but only gas mixtures with small percentages of hydrogen. For the upcoming years the task will be carried out by the committee to make the ISO/TC 193 portfolio of standards resilient for the future. In other words adapt and revise the relevant existing standards in such a way that they are also applicable to natural gas/hydrogen blends (up to 20 %). Pure hydrogen (100 %) is not included in the scope of this committee. That means a grey area exists which is not precisely defined. Monitoring the market needs and creating a strong liaison with ISO/TC 197 Hydrogen technologies is necessary to refine this part of the scope in due time.

Next, an agreement with CEN exists and will be upheld that all published ISO/TC 193 standards will be taken over as European standards via CEN/TC 238 'Test gases, test pressures, appliance categories and gas appliance types' and CEN/TC 408 'Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid' when appropriate.

5.3 Supporting the climate agenda

For the development of ISO/TC 193 standards the ISO Guide 84:2020 *Guidelines for addressing climate change in standards* will be taken into account. This document provides guidance to standards developers on how to take account of climate change in the planning, drafting, revision and updating of ISO standards and other deliverables. It outlines a framework and general principles that standards developers can use to develop their own approach to addressing climate change on a subject-specific basis.

Through standardisation activities for in particular biomethane and the blending of (renewable) hydrogen with natural gas, ISO/TC193 provides a tangible contribution to making the energy transition from fossil fuel to renewable fuel happen. The committee collaborates with research associations and research groups, as a stakeholder or as initiator to ensure that the necessary input for standardisation is gathered or generated. One example of this collaboration is the work on the ISO 2610-series of standards, for which substantial input was made by several European

research programmes. Through these mechanisms, ISO/TC193 contributes to the further dissemination of the know-how to all continents and countries participating in its committee.

6 Factors affecting completion and implementation of the ISO/TC work programme

The following factors could place constraints on the completion of the objectives:

- less availability of expertise due to re-organizations in the natural gas sector;
- less time for (actual) experts to dedicate to standardization development;
- less funds and research time (of-line instrumentation) available in organizations to be involved in interlaboratory studies to assess standard test methods;
- changing market needs due to the developments in the energy transition with its focus on less use of fossil energy sources.

7 Structure, current projects and publications of the ISO/TC

Information on ISO online

See also [ISO/TC 193 website](#).

Reference information

[Glossary of terms and abbreviations used in ISO/TC Business Plans](#)

[General information on the principles of ISO's technical work](#)