

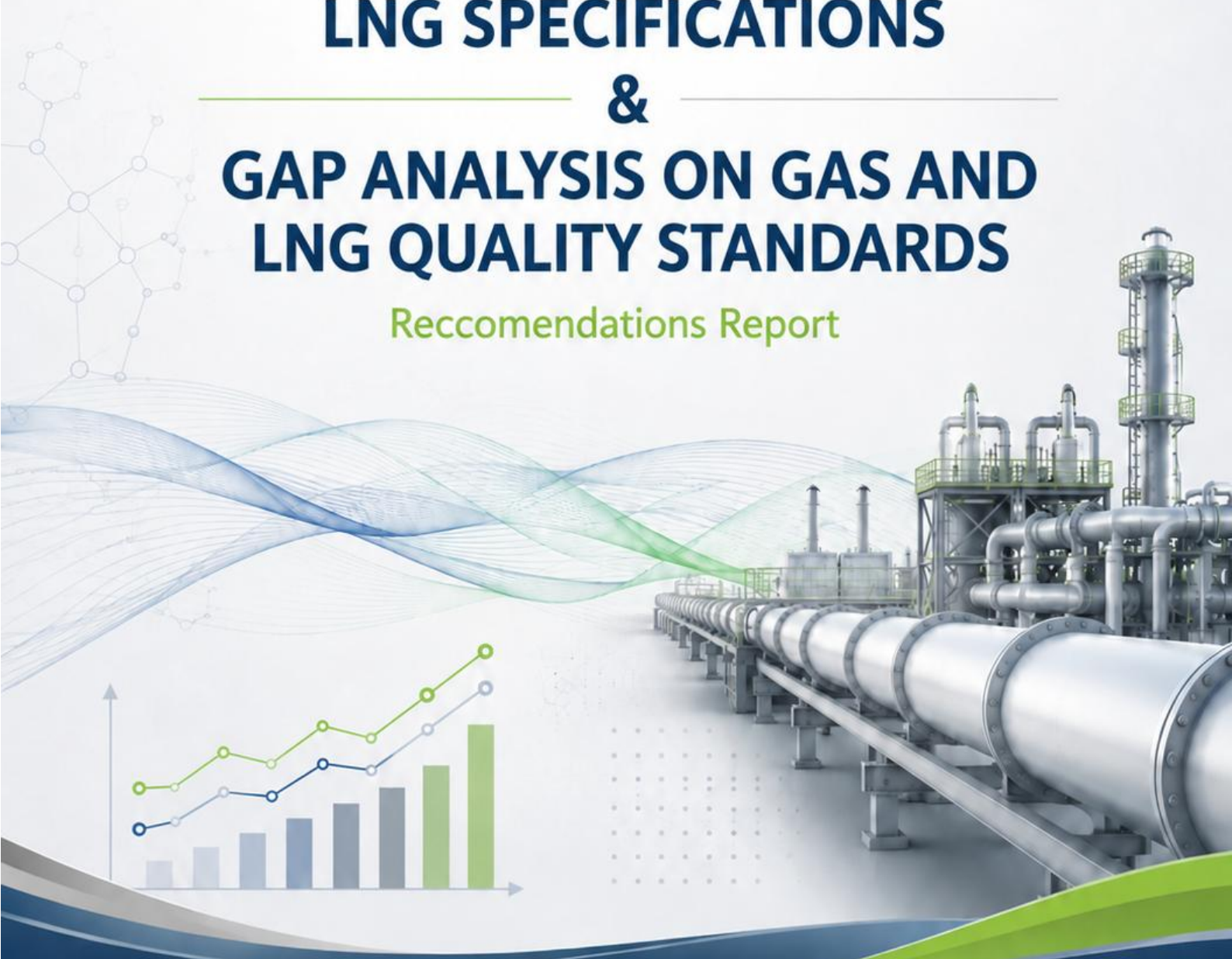
EMGF Implement Group 3: Harmonizing Gas Export Regulations

MAPPING EXISTING GAS AND LNG SPECIFICATIONS

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GAP ANALYSIS ON GAS AND LNG QUALITY STANDARDS

Reccomendations Report



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Executive Summary

This report presents the first-stage assessment undertaken by EMGF Implementation Group 3 on the harmonization of export gas quality standards. It compares the gas and LNG quality specifications reported by Egypt, Israel, Cyprus and Jordan with the requirements of Greece and Italy, which are treated as the principal European destination markets during this phase. The assessment aims at mapping existing gas and LNG specifications across EMGF countries as well as conducting a gap analysis to identify relevant technical, measurement and reporting gaps, evaluate their potential implications for interoperability and market access, and establish a structured basis for future regional harmonization. It is not intended to prescribe a single binding regional specification at this stage.

The assessment indicates that the participating countries already demonstrate a substantial degree of compatibility. Nevertheless, differences remain in the units used, reference temperature and pressure conditions, measurement methodologies, reporting practices and, for certain parameters, applicable specification limits. The principal areas requiring attention include energy-content and interchangeability parameters, particularly HHV/GCV and the Wobbe Index, together with H₂S, Total Sulphur, Water Content and Dew Points. These differences do not all represent direct technical incompatibilities. However, where they are not appropriately managed, they may affect gas acceptance, infrastructure operation, blending or processing requirements, contractual arrangements and the marketability of regional gas exports.

A phased and evidence-based harmonization approach is therefore recommended. The immediate priority should be to complete the regional dataset and introduce the proposed EMGF Gas and LNG Quality Reporting Template presented in Annex A, which provides a common structure for reporting units, reference conditions, analytical methods and reporting conventions. On this basis, each parameter can then be addressed through the most appropriate pathway, including measurement alignment, operational measures, gradual convergence or, where justified, the adoption of common specification limits. This approach would support more efficient cross-border gas flows, improve LNG compatibility with European destination markets, facilitate the utilization of existing and planned regional infrastructure, and provide EMGF with a practical technical framework capable of evolving alongside future market, infrastructure and supply developments.

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Abbreviations and Technical Symbols

Abbreviation / Symbol	Meaning
BTU	British Thermal Unit
C5+	Pentanes and heavier hydrocarbon components
CO₂	Carbon Dioxide
DLNG	Damietta Liquefied Natural Gas
ELNG	Egyptian Liquefied Natural Gas
EMGF	East Mediterranean Gas Forum
EU	European Union
FSRU	Floating Storage and Regasification Unit
GCV	Gross Calorific Value
GIAC	Gas Industry Advisory Committee
HHV	Higher Heating Value
H₂S	Hydrogen Sulphide
IG-3	Implementation Group 3: Harmonizing Export Regulations
kWh	Kilowatt-hour
LNG	Liquefied Natural Gas
MJ	Megajoule
mol %	Mole percentage
N₂	Nitrogen
Nm³	Normal cubic metre
O₂	Oxygen
ppm	Parts per million
RSH	General chemical notation for mercaptans or thiols
Scm	Standard cubic metre
Sm³	Standard cubic metre
TSO	Transmission System Operator

1. Introduction

In view of the strategic objectives of the East Mediterranean Gas Forum aiming at enhancing regional cooperation and integration across the natural gas value chain in the East Mediterranean region, this report has been developed by GIAC Implementation Group (IG-3) - which serves as one of EMGF's new groups for implementing its strategy - with the aim of harmonizing export regulations and gas quality standards for export across member countries. The Implementation Group seeks to prepare a comprehensive booklet compiling natural gas market regulations, cross border Infrastructure regulations, and decarbonization regulations.

The first task of this working group will focus on “harmonizing quality standard of export gas” across the forum’s producing members, to ensure technical compliance and alignment with the targeted export markets. For the initial phase the target markets will be limited to Europe, while the North American and Asian markets will be considered in the next phase. Those markets together represent the most strategic destinations for East Mediterranean gas exports.

The report serves as a first step towards establishing a common reference framework, enabling improved alignment and technical coordination among producers, transmission system operators, LNG exporters and buyers. It provides an overview of current national gas quality standards and operational practices within Egypt, Israel and Cyprus – the producing and exporting members of the EMGF – reflecting the differing conditions of their upstream resources, processing facilities and export infrastructures.

Building on this overview, a high-level gap analysis was conducted to identify any discrepancies between current quality standards in member countries and those enforced in global target markets and accordingly set priority areas for alignment.

Ultimately, this process aims to guide the development of a unified standard gas quality format for EMGF members, supporting improved alignment with importing markets, optimizing regional infrastructure utilization, and reinforcing the East Mediterranean region as a reliable, efficient, and competitive supplier of natural gas and LNG.

To support the collection and comparison of the technical information required for this process, a proposed standardized reporting template is provided in Annex A.

2. Comparative Assessment of Existing Standards

2.1. EMGF Producing/ Potential Exporting Member Countries:

2.1.1. *Egypt*

Egypt is the largest natural gas producer and consumer in the East Mediterranean region, with a well-established upstream sector and diversified domestic demand base. Egypt has developed an integrated national gas grid and a liberalizing market structure, supported by ongoing regulatory reforms and an active midstream sector.

Egypt is also the only EMGF member with operational LNG export facilities, positioning the country as a regional export hub. The Idku and Damietta LNG plants enable Egypt to export LNG to Europe, Asia and other premium markets, leveraging surplus domestic production as well as imported and re-exported gas. The country plays a central role in regional gas trade flows, acting as a key outlet for East Mediterranean gas volumes destined for international markets.

From a gas quality perspective, Egypt applies defined national specifications for pipeline gas (which is included in the Transmission Network Code) and LNG, which reflect its processing capabilities and the requirements of international LNG buyers. Harmonizing these specifications with other producer countries and with the standards in target markets is essential to ensure compatibility, maximize utilization of export infrastructure, and support the creation of a unified regional gas quality framework.

2.1.2. *Israel*

Israel has rapidly emerged as a key gas producer in the Eastern Mediterranean, driven by major offshore discoveries and the commercialization of large deepwater fields. Domestic gas demand is expanding, primarily through the power generation, industry and petrochemical sectors, supported by infrastructure upgrades and growing private-sector participation. Israel's gas policy framework prioritizes supply security, export maximization and long-term resource monetization.

Israel is already exporting natural gas regionally through cross-border pipelines to Jordan and Egypt, with additional export arrangements under development. The continued expansion of export volumes is expected to enhance regional integration and reinforce Israel's position as a long-term supplier within EMGF.

Gas quality standards in Israel are shaped by the characteristics of domestic offshore production and the technical parameters of its transmission network. Aligning Israel's specifications with a harmonized EMGF quality framework will facilitate smoother cross-border flows, minimize operational constraints, and enhance the competitiveness of its exported gas in global markets.

2.1.3. *Cyprus*

Cyprus is progressing toward the development of its offshore gas resources, following several significant exploration successes in recent years. While domestic gas consumption remains limited, national plans prioritize the introduction of natural gas, through an FSRU into the domestic energy mix to enhance energy security, reduce power sector emissions, and support industrial growth.

With discoveries located offshore and development plans evolving, Cyprus is expected to participate in regional gas trade in a dual role. For the export cases assessed in this report, including Aphrodite and Cronos, Cypriot gas is expected to be routed through Egyptian infrastructure for treatment and liquefaction and would therefore need to meet the applicable Egyptian transmission-system specifications. In parallel, Cyprus is progressing the

development of LNG import infrastructure to support the introduction of natural gas into its domestic market.

The harmonization of gas quality specifications is especially relevant for Cyprus as it progresses toward production and export readiness. Establishing alignment with regional standards and with the technical requirements of target markets will support future export planning, reduce market entry risks, and ensure compatibility with regional infrastructure.

2.1.4. Jordan

Primarily a natural gas importing country with a strategic role in the Eastern Mediterranean gas market through its regional pipeline interconnections and LNG import infrastructure. While current energy policy is focused on increasing domestic production from the Risha gas field to achieve self-sufficiency and reduce import dependence, future production growth could enable limited pipeline exports to neighboring countries through the Arab Gas Pipeline. In the meantime, Jordan's principal contribution to regional gas integration lies in its role as a transit and interconnection country, facilitating cross-border gas flows and supporting regional energy security. From a gas quality perspective, Jordan applies specifications for imported gas to ensure the safe and reliable operation of its transmission system. Harmonization of these specifications with regional and European market requirements would enhance interoperability, facilitate future cross-border trade, and support the development of a harmonized EMGF gas quality framework.

2.2. Gas and LNG Quality Specifications in EMGF Producing/Potential Exporting Member Countries

2.2.1. Gas Quality Specifications

Table 1 summarizes the pipeline gas quality specifications applicable to the EMGF producing and potential exporting Member Countries included in this assessment. The specifications presented are based on the following national, contractual or operational references:

- **Egypt:** Gas quality specifications applicable at Transmission System entry points, as established under the current Transmission Network Code approved by the Gas Regulatory Authority (GasReg).
- **Israel:** Gas quality specifications applicable under the Gas Sale and Purchase Agreement governing Israeli gas exports to Egypt.
- **Cyprus:** For the Cyprus export case assessed in this report, gas is assumed to be delivered through Egyptian infrastructure for treatment and liquefaction. Accordingly, the applicable Egyptian GasReg Transmission System specifications are used for the comparative assessment.
- **Jordan:** Gas quality specifications applicable to the Jordanian gas network.

Table 1. Pipeline Gas Quality Specifications in EMGF Producing and Potential Exporting Member Countries

Parameter	Egypt	Israel	Jordan	Cyprus
Water Dew Point	< 0 °C at 70 Kg/cm ² (g)	≤ 0 °C At any pressure ≤80 barg	≤ -5 °C at 70 bar	< 0 °C at 70 kg/cm ² (g)
Hydrocarbon Dew Point	≤ 5 °C below the delivery pressure.	≤ 5 °C At any pressure up to and including 80 bar(g)	≤ 0 °C at 70 bar	≤ 5 °C below the delivery pressure.
Total Sulphur	≤ 30 mg/Scm	≤ 100 ppm vol	< 150 mg/Scm	≤ 30 mg/Scm
Mercaptans	7 mg/Scm av.	Not defined	< 15 mg/m ³	7 mg/Scm av.
Hydrogen Sulphide	< 4 ppm vol	Off-spec threshold: > 5 ppm for up to 8 hours, or > 8 ppm at any given time	< 8 ppm vol.	≤4 ppm vol
CO ₂	≤ 3.0 mol %	≤ 2.0 mol %	≤ 0.55 mol %	≤3.0 mol %
Mercury	≤ 6.0 µg/m ³		≤ 30 µg/Scm	≤ 6.0 µg/m ³
Total Inerts	-	≤ 5.0 Mole %		-
Oxygen	≤ 0.01 Mole %	≤ 0.01 Mole %	≤ 250 ppm	≤ 0.01 Mole %
Methane	-	≥ 92 Mole %		-
Higher Heating Value	> 980 BTU/SCF	0.0346 – 0.0395 MMBTU/Scm	980-1180 BTU/SCF	> 980 BTU/SCF
Wobbe Index	-	0.0462 – 0.0509 MMBTU/Scm		-

2.2.2. LNG Quality Specifications

The following tables summarize the LNG quality specifications applicable to LNG produced at Egypt's two liquefaction facilities, Damietta LNG (DLNG) and Egyptian LNG (ELNG), as well as the specifications applicable to LNG imported through Floating Storage and Regasification Units (FSRUs).

Table 2 presents the LNG quality specifications applicable to LNG produced at the Damietta LNG facility and the two Egyptian LNG trains.

Table 2. LNG Quality Specifications for Egyptian LNG Export Facilities

Parameter	Unit	DLNG	ELNG Train 1	ELNG Train 2
HHV	BTU/SCF	1000–1150	990–1095	990–1095
Methane	mol %	> 91	> 85.7	> 85.7
Ethane	mol %	1.2–4.5	< 8.8	< 8.8
Propane	mol %	—	< 3.4	< 3.25
Inerts	mol %	< 1	< 1.3 (N ₂)	< 1.3 (N ₂)
Total Sulphur	mg/m ³	< 15 (Normal m ³)	< 71 (Standard m ³)	< 30 (Standard m ³)
Mercaptans (S from RSH)	mg/m ³	< 7 (Normal m ³)	< 1.9 (Standard m ³)	< 1.9 (Standard m ³)
Carbonyl Sulphide	mg/m ³	< 4 (Nm ³)	—	—
Hydrogen Sulphide (H ₂ S)	As reported	< 5 mg/Normal m ³	< 4.74 mg/Standard m ³	< 0.5 ppm vol/vol
C5+ (after one week of storage)	mol %	< 0.15	—	—
n-Butane	mol %	< 0.5	< 0.95	< 0.75
i-Butane	mol %	< 0.5	< 0.95	< 0.6
Pentane	mol %	—	< 0.45	< 0.25
CO ₂	mol %	< 0.01	—	—
Water	ppm	< 1	—	—
Dust Content	ppm	< 15	—	—
Particle Size of Dust	µm	< 5	—	—
Mercury	ng/m ³	< 5 (Normal m ³)	< 50 (Standard m ³)	< 50 (Standard m ³)
Wobbe Index	MJ/Nm ³	53.6–56.06	48.8–55.6 (1240–1410 BTU/SCF)	48.8–55.6 (1240–1410 BTU/SCF)
Hydrocarbon Dew Point	°C	—	< –5 °C from 1–80 bar	< –5 °C from 1–80 bar

Table 3 presents the quality specifications applicable to LNG imported into Egypt through FSRU facilities.

Table 3. LNG Quality Specifications for LNG Imports into Egypt

Parameter	Unit	Imported LNG
HHV	BTU/Scm	35,315–40,612
Methane	mol %	> 85.7
Ethane	mol %	< 8.37
Propane	mol %	< 3
n-Butane	mol %	< 0.7
i-Butane	mol %	< 0.6
i-Pentane	mol %	< 0.23
n-Pentane	mol %	< 0.23
N ₂	mol %	< 1.3
Total Sulphur	mg/Nm ³	< 70
Mercaptans (RSH)	mg/Nm ³	< 7
Hydrogen Sulphide (H ₂ S)	mg/Nm ³	< 5

2.3. EMGF Targeted Markets

For the initial phase the target markets will be limited to Europe, while the North American and Asian markets will be considered in the next phase. To ensure technical compliance and alignment of East Mediterranean gas exports, mapping of existing standards for the quality specifications of imports into the European market has been conducted for Greece and Italy. Cyprus has also been included as a European LNG import market, reflecting the development of its FSRU project and the planned introduction of natural gas into the domestic market

Table 4 summarizes the principal quality parameters and specification limits reported for the selected destination markets. For Italy, the specifications reported in Table 4 refer to the Piombino and Ravenna FSRUs.

Table 4. Gas and LNG Quality Specifications in Selected Destination Markets

Parameter	Greece	Italy	Cyprus (LNG Import Specifications)
Gross Heating Value	11.131–12.647 kWh/Nm ³	34.95–45.28 MJ/Sm ³	37.2–42.88 MJ/Nm ³
Wobbe Index	13.066–16.328 kWh/Nm ³	Ravenna and Piombino: 47.31–52.8 MJ/Sm ³	48.05–53.8 MJ/Nm ³
LNG Density	430–478 kg/m ³ . Operator may accept 420–430 kg/m ³ or 478–483.1 kg/m ³ after blending	Ravenna: 420–470 kg/m ³ Piombino: 420–460 kg/m ³	418–465 kg/m ³
Methane	85–97 mol %. Operator may accept 80–85 mol % or 97–99 mol % after blending	—	87 mol % minimum
Butane	< 4 mol %	—	Butanes and pentanes: 1.5 mol % maximum
Pentanes / C5+	C5 < 2 mol %. C5+: N/A	—	Propane, butane and C5+: 4.0 mol % maximum
CO ₂	—	< 2.5 mol %	—
N ₂	< 1.24 mol %	—	1.0 mol % maximum
Oxygen	—	< 0.6 mol %	—
H ₂ S	< 5 mg/Nm ³	< 5 mg/Sm ³	1 mg/Nm ³ maximum
Total Sulphur	< 30 mg/Nm ³	< 20 mg/Sm ³	1 mg/Nm ³ maximum
Mercaptans	—	< 6 mg/Sm ³	—
Water Dew Point	—	≤ -5 °C at 7000 kPa(g)	—
Hydrocarbon Dew Point	—	≤ 0 °C within the pressure range 100–7000 kPa(g)	—
Relative Density	—	0.555–0.700	—
Hydrogen	—	≤ 2% vol	—
Minimum Gas Temperature	—	> 3 °C	—
Maximum Gas Temperature	—	< 50 °C	—

The Italian specification controls the acceptability of components such as methane, pentane and heavier hydrocarbons intrinsically through the permitted range of the Wobbe Index.

3. Gap Analysis on Gas and LNG Quality Standards

3.1. Introduction and Scope

A gap analysis was conducted on the gas quality specifications of East Mediterranean producing or potential exporting countries against selected destination-market requirements. The review is based on the data provided in this report and is intended to identify areas where greater technical comparability or alignment may be beneficial. It does not propose the automatic adoption of a unified regional specification. Any future harmonization measure that could require changes to national legislation, regulatory requirements, infrastructure or binding technical specifications would be subject to separate assessment and approval by the competent national authorities, where applicable.

The purpose of the analysis is to highlight differences in specification limits, measurement units and the level of regulatory detail applied by countries that may participate in regional gas exchanges.

The analysis focuses on the countries included in the supplied dataset: Egypt, Israel, Cyprus, Greece, Italy and Jordan.

- **Egypt, Israel, Cyprus and Jordan** are assessed as producing or potential exporting countries. Cyprus is additionally assessed as an LNG European import market, alongside Greece and Italy as destination/reference markets. For the Cyprus export case, processed gas specifications are represented by the applicable Egyptian transmission-system specifications, reflecting the export route through Egyptian infrastructure.
- **Physical trading toward Italy and Greece** is assumed to occur primarily through LNG chains rather than direct pipeline interconnections, except within the broader regional interconnection context. Cyprus is assessed separately as an LNG import market on the basis of its submitted import specifications.
- The assessment considers not only whether a parameter is compliant with destination-market requirements, but also whether countries use comparable units, definitions, reference conditions and sufficiently explicit specifications to support interconnection agreements and LNG trading arrangements.

3.2. Analytical Framework

In addition to providing a comparative overview of national gas quality specifications, this report introduces a structured analytical framework designed to support future regional harmonization efforts. Rather than limiting the analysis to the identification of technical differences, the report evaluates the practical significance of those differences, their implications for regional interoperability and market integration, and the feasibility of potential harmonization measures.

Through the combined use of comparative assessment, gap analysis, harmonization feasibility assessment and roadmap integration, the study aims to transform the collected technical information into a practical decision-support framework that can support future work within EMGF Implementation Group 3.

The assessment follows a progressive analytical approach consisting of five consecutive steps:

- **Step 1 – Country Data Collection:** Compilation and validation of the gas and LNG quality specifications submitted by the participating countries.

- **Step 2 – Comparative Assessment:** Comparison of the submitted specifications of producing or potential exporting countries against destination-market requirements in order to identify significant differences or data gaps.
- **Step 3 – Gap Analysis:** Evaluation of the identified differences in terms of technical compatibility and commercial relevance.
- **Step 4 – Assessment of Gap Impacts:** Assessment of the level of impact associated with the identified gaps, including infrastructure, commercial and regulatory implications, in order to determine harmonization priorities.
- **Step 5 – Harmonization Pathway Recommendation:** Identification of the most appropriate harmonization pathway for each quality parameter by country.

The proposed EMGF Gas and LNG Quality Reporting Template presented in Annex A translates this analytical framework into a standardized instrument for future country submissions and updates. It is intended to improve the consistency and comparability of reported information by recording specification limits, units, reference conditions, original submitted values, remarks and analytical methods in a common format. The template does not, at this stage, constitute an adopted or binding regional gas quality specification.

3.3. Rationale for the Analytical Tables

The country templates developed under IG-3 provide a valuable dataset of national gas and LNG quality specifications. However, comparison of technical parameters alone is not sufficient to support future policy recommendations or harmonization efforts. The analytical framework therefore introduces two complementary assessment matrices designed to progressively address four key questions:

- What are the existing gas quality specifications?
- Where are the principal technical or regulatory gaps?
- Can these gaps realistically be harmonized?
- What technical, regulatory and market actions would implementation require?

The two matrices supporting the final assessment are:

- **Gap Analysis Matrix:** identifies and evaluates the significance of differences between national specifications and destination-market requirements for each potential exporting country. Rather than simply comparing numerical values, it assesses the identified gaps across the following dimensions:
 - **Deviation:** assessment of the numerical deviation of each gas quality specification and gas analysis parameter from destination-market requirements. Some unit conversions have been conducted for the purpose of comparison.
 - **Measurement/Reporting:** identification of differences or gaps in measurement conditions, units and reporting practices.
 - **Regulatory:** assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.
 - **Technical:** assessment of the potential impact on the physical operation of gas systems, including safety, reliability, corrosion, hydrate formation, metering stability and equipment integrity.
 - **Commercial:** assessment of the potential consequences for market access, cargo acceptance, blending costs, contractual arrangements and the overall competitiveness of gas exports.

- **Harmonization Priority and Pathway Matrix:** evaluates the technical, infrastructure and commercial impacts of the identified gaps in order to determine relative harmonization priorities. The matrix also identifies the most appropriate harmonization pathway for each quality parameter from the following options:
 - **Gradual Convergence:** where infrastructure upgrades, regulatory adjustments or transition periods may be required before convergence toward a common reference specification could be considered.
 - **Operational Measures:** where operational flexibility, blending or processing can effectively accommodate differences without requiring full standardization.
 - **Align Measurements:** appropriate where differences in units, reference conditions or calculation methodologies prevent meaningful technical comparison and should therefore be addressed before any attempt is made to harmonize specification limits.

3.4. Gap Analysis Matrix by Country – Gas Quality Specifications

Tables 5–9 present the comparative gap analysis of the principal gas quality specifications reported by the producing or potential exporting Member Countries against the selected destination-market requirements. Where necessary, submitted values have been converted for comparative purposes, while differences in original units and reference conditions are separately identified within the assessment. Table 10 consolidates the principal cross-country observations arising from the comparison.

**Some units have been converted from the submitted data for comparative purposes.*

Table 5. Destination-Market Requirements for Gas Quality Specifications

Destination Market	HHV/GCV*	Wobbe Index*	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Greece	11.131–12.647 kWh/Nm ³	13.066–16.328 kWh/Nm ³	—	—	—	430–478 kg/m ³
Italy	34.95–45.28 MJ/Sm ³	47.31–52.8 MJ/Sm ³	—	≤ -5 °C at 7000 kPa(g)	≤ 0 °C within 100–7000 kPa(g)	Ravenna: 420–470 kg/m ³
						Piombino: 420–460 kg/m ³
Cyprus (LNG Import Specifications)	37.2–42.88 MJ/Nm ³	48.05–53.8 MJ/Nm ³	—	—	—	418–465 kg/m ³

Table 6. Gap Analysis for Egypt (Exports) – Gas Quality Specifications

Assessment	HHV/GCV*	Wobbe Index*	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Reported Specification	36.8–42.8 MJ/Sm³	48.8–56.06 MJ/Nm³	< 1 ppm		< –5 °C at 80 bar	
Deviation	None	Slight Upper Limit Deviation	N/A		None	
Measurement/Reporting	Measurement Units	Measurement Conditions/Units		Reporting		Reporting
Technical	None					
Commercial	None	Reduced Marketability				
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					

Table 7. Gap Analysis for Israel – Gas Quality Specifications

Assessment	HHV/GCV*	Wobbe Index*	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Reported Specification	36.5–41.6 MJ/Sm ³	48.7–53.7 MJ/Scm		< 0 °C up to 80 barg	≤ 5 °C up to 80 barg	
Deviation	None	Very Minor				
Measurement/Reporting	Measurement Units	Measurement Conditions/Units	Reporting	Measurement Conditions	Measurement Conditions	Reporting
Technical	None				Pipeline Restrictions	
Commercial	None	Reduced Marketability				
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					

Table 8. Gap Analysis for Cyprus (Exports via Egypt) – Gas Quality Specifications

Assessment	HHV/GCV*	Wobbe Index*	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Reported Specification	36.8–42.8 MJ/Sm³	48.8–56.06 MJ/Nm³	< 1 ppm		< –5 °C at 80 bar	
Deviation	None	Slight Upper Limit Deviation	N/A		None	
Measurement/Reporting	Measurement Units	Measurement Conditions/Units		Reporting		Reporting
Technical	None					
Commercial	None	Reduced Marketability				
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					

Table 9. Gap Analysis for Jordan – Gas Quality Specifications

Assessment	HHV/GCV*	Wobbe Index*	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Reported Specification	36.5–43.9 MJ/Sm ³			< –5 °C at 70 bar	< 0 °C at 70 bar	
Deviation	None					
Measurement/Reporting	Measurement Units	Reporting	Reporting	Measurement Conditions	Measurement Conditions	Reporting
Technical	None					
Commercial	None					
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					

Table 10. Cross-Country Assessment of Gas Quality Specification Gaps

Parameter	Assessment Comment
HHV/GCV	Energy-content specifications are reported using different units and reference bases.
Wobbe Index	A core interchangeability parameter. The upper range reported for Egypt and the Cyprus export case exceeds the Italian benchmark, while Israel shows only a minor upper-range deviation. Jordan does not report a Wobbe Index value in the submitted dataset. Values are also reported using different units and reference conditions.
Water Content	Only Egypt and, by application of the Egyptian export specification, the Cyprus export case provide an LNG water-content value. No sufficiently comparable destination-market benchmark or cross-country dataset was submitted for a broader assessment.
Water Dew Point	Destination-market requirements may be stricter than some exporter-side specifications. Values are reported under different pressure and reference conditions.
Hydrocarbon Dew Point	Exporter-side values may be less stringent than the Italian benchmark and are reported under different pressure conditions.
LNG Density	LNG density is not reported by all potential exporting countries.

3.5. Gap Analysis Matrix by Country – Gas Analysis

Tables 11–15 present the comparative gap analysis of the principal gas-composition parameters reported by the producing or potential exporting Member Countries against the selected destination-market requirements. Where necessary, submitted values have been converted for comparative purposes, while differences in original units, reference conditions and reporting practices remain separately identified. Table 16 consolidates the principal cross-country observations arising from the assessment.

**Some units have been converted from the submitted data for comparative purposes.*

Table 11. Destination-Market Requirements – Gas Analysis

Destination Market	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S*	Total Sulphur*	Mercaptans	Mercury
Greece	85–97 mol %	C5 < 2 mol %; C5+: N/A	—	< 1.24 mol %	—	< 5 mg/Nm ³	< 30 mg/Nm ³	—	—
Italy	—	—	< 2.5 mol %	—	< 0.6 mol %	< 5 mg/Sm ³	< 20 mg/Sm ³	< 6 mg/Sm ³	No specific numerical requirement
Cyprus (LNG Import Specifications)	≥ 87 mol %	Propane, butane and C5+: 4.0 mol % maximum	—	1.0 mol % maximum	—	1 mg/Nm ³ maximum	1 mg/Nm ³ maximum	—	—

**Italy: No specific requirement exists for Mercury. However, as provided under the applicable Network Code, the gas, under operating conditions, must not contain traces of: (a) water and hydrocarbons in liquid form; (b) solid particulate matter in quantities that could damage the materials used for gas transport; or (c) other elements that could have effects on the safety or integrity of the gas transmission system.*

Table 12. Gap Analysis for Egypt (Exports) – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S*	Total Sulphur*	Mercaptans	Mercury
<i>Reported Specification</i>	85–91 mol %	C5: < 0.25–0.45 mol % C5+: < 0.15 mol %	< 0.01 mol %	< 1.3 mol %	< 0.01 mol %	< 5 mg/m ³	< 30 mg/Sm ³	< 7 mg/Nm ³	< 50 ng/Sm ³
<i>Deviation</i>	None	None	None	Slight Upper Limit Deviation	None	None	Upper Limit Deviation	Slight Upper Limit Deviation	N/A
<i>Measurement/Reporting</i>	N/A	N/A	—	—	—	—	N/A	Measurement Conditions	—
<i>Technical</i>	—	—	—	Pipeline Restrictions	—	—	Pipeline Restrictions	Pipeline Restrictions	—
<i>Commercial</i>	—	—	—	Impact on HHV	—	—	—	—	—
<i>Regulatory</i>	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.								

Table 13. Gap Analysis for Israel – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S*	Total Sulphur*	Mercaptans	Mercury
<i>Reported Specification</i>	> 92 mol %	—	≤ 2 mol %	—	< 0.01 mol %	> 5 ppm for up to 8 hours, or > 8 ppm at any given time	≤ 100 ppm vol	Not defined	—
<i>Deviation</i>	No Upper Limit	—	None	—	None	Upper Limit Deviation	Significant Deviation	N/A – specification not defined	N/A
<i>Measurement/Reporting</i>	—	Reporting	—	Reporting	—	Measurement Conditions	Measurement Conditions	Reporting	—
<i>Technical</i>	—	—	—	—	—	Pipeline Restrictions	Pipeline Restrictions	—	—
<i>Commercial</i>	—	—	—	—	—	—	—	—	—
<i>Regulatory</i>	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.								

Table 14. Gap Analysis for Cyprus (Exports via Egypt) – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S*	Total Sulphur*	Mercaptans	Mercury
Reported Specification	85–91 mol %	C5: < 0.25–0.45 mol % C5+: < 0.15 mol %	< 0.01 mol %	< 1.3 mol %	< 0.01 mol %	< 5 mg/m ³	< 30 mg/Sm ³	< 7 mg/Nm ³	< 50 ng/Sm ³
Deviation	None	None	None	Slight Upper Limit Deviation	None	None	Upper Limit Deviation	Slight Upper Limit Deviation	N/A
Measurement/Reporting	N/A	N/A	—	—	—	—	N/A	Measurement Conditions	—
Technical	—	—	—	Pipeline Restrictions	—	—	Pipeline Restrictions	Pipeline Restrictions	—
Commercial	—	—	—	Impact on HHV	—	—	—	—	—
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.								

Table 15. Gap Analysis for Jordan – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S*	Total Sulphur*	Mercaptans	Mercury
Reported Specification	—	—	< 0.55 mol %	< 0.43 mol %	< 0.025 mol %	< 11 mg/m ³	< 150 mg/Scm	< 15 mg/m ³	< 30 µg/Sm ³
Deviation	—	—	None	None	None	Upper Limit Deviation	Significant Deviation	Upper Limit Deviation	N/A
Measurement/Reporting	Reporting	Reporting	—	—	—	Measurement Conditions	—	Measurement Conditions	—
Technical	—	—	—	—	—	Pipeline Restrictions	Pipeline Restrictions	Pipeline Restrictions	—
Commercial	—	—	—	—	—	—	—	—	—
Regulatory	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.								

Table 16. Cross-Country Assessment of Gas Analysis Gaps

Parameter	Assessment Comment
Methane	Reported values for Egypt, the Cyprus export case and Israel fall within or overlap the destination-market ranges. No material gap is identified on the basis of the submitted data.
Pentanes / C5+	Specific C5/C5+ values are reported for Egypt and, by application of the Egyptian export specification, the Cyprus export case. Comparable values were not submitted for Israel or Jordan.
CO ₂	The reported CO ₂ limits for the assessed exporting countries are below the Italian maximum limit. No material upper-limit deviation is identified on the basis of the submitted data.
N ₂	Egypt and the Cyprus export case report an upper limit slightly above the Greek benchmark. Israel reports total inerts rather than a separate N ₂ specification. Jordan reports a lower N ₂ limit.
O ₂	Reported limits for Egypt, the Cyprus export case, Israel and Jordan are below the Italian destination-market limit. No material gap is identified.
H ₂ S	Values are reported using different units and reference conditions. Higher limits are identified for Israel and Jordan relative to the selected destination-market requirements, while Egypt and the Cyprus export case are closer to the Italian benchmark but remain subject to differences in measurement basis.
Total Sulphur	Egypt and the Cyprus export case are less stringent than the Italian benchmark. Israel and Jordan allow substantially higher limits and also report values using different unit bases.
Mercaptans	A slight upper-limit deviation is identified for Egypt and the Cyprus export case relative to the Italian benchmark, while Jordan reports a higher limit. Israel does not define a specific mercaptans specification.
Mercury	No comparable numerical destination-market benchmark was submitted for the purposes of this assessment.

3.6. Harmonization Priority and Pathway Matrix by Country – Gas Quality Specifications

Tables 17–20 present the harmonization priorities and indicative pathways identified for the principal gas quality specification parameters in each producing or potential exporting country. The pathways are technical and non-binding and are intended to indicate the type of action that may warrant further assessment rather than to prescribe changes to national requirements.

Table 17. Harmonization Priority and Pathway for Egypt (Exports) – Gas Quality Specifications

Assessment	HHV/GCV	Wobbe Index	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Infrastructure Impact	None	Low	—	—	—	—
Commercial Impact	None	Medium	—	—	—	—
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					
Harmonization Priority	High	High	—	—	—	—
Harmonization Pathway	Align Units	Align Measurements and Units; Operational Measures (e.g. blending)	N/A	Reporting with aligned measurement units for LNG exports	N/A	Reporting with aligned measurement units

Table 18. Harmonization Priority and Pathway for Israel – Gas Quality Specifications

Assessment	HHV/GCV	Wobbe Index	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Infrastructure Impact	None	Low	—	—	—	—
Commercial Impact	None	Medium	—	—	—	—
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					
Harmonization Priority	High	High	—	—	—	—
Harmonization Pathway	Align Units	Align Measurements and Units; Operational Measures (e.g. blending)	N/A	Align Measurement Conditions	Align Measurements	Reporting with aligned measurement units

Table 19. Harmonization Priority and Pathway for Cyprus (Exports via Egypt) – Gas Quality Specifications

Assessment	HHV/GCV	Wobbe Index	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Infrastructure Impact	None	Low	—	—	—	—
Commercial Impact	None	Medium	—	—	—	—
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					
Harmonization Priority	High	High	—	—	—	—
Harmonization Pathway	Align Units	Align Measurements and Units; Operational Measures (e.g. blending)	N/A	Reporting with aligned measurement units for LNG exports	N/A	Reporting with aligned measurement units

Table 20. Harmonization Priority and Pathway for Jordan – Gas Quality Specifications

Assessment	HHV/GCV	Wobbe Index	Water Content	Water Dew Point	Hydrocarbon Dew Point	LNG Density
Infrastructure Impact	None	—	—	—	—	—
Commercial Impact	None	—	—	—	—	—
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.					
Harmonization Priority	High	—	—	—	—	—
Harmonization Pathway	Align Units	Reporting with aligned measurement units	N/A	Align Measurement Conditions	Align Measurements	Reporting with aligned measurement units

3.7. Harmonization Priority and Pathway Matrix by Country – Gas Analysis

Tables 21–24 present the harmonization priorities and indicative pathways identified for the principal gas-composition parameters. As with the preceding assessment, the proposed pathways are technical and non-binding and are intended to guide subsequent analysis and discussion.

Table 21. Harmonization Priority and Pathway for Egypt (Exports) – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S	Total Sulphur	Mercaptans
Infrastructure Impact	—	—	—	Medium	—	—	Low	Low
Commercial Impact	—	—	—	Low	—	—	Low	Low
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.							
Harmonization Priority	Low	Low	Low	Medium	Low	Low	Medium	Medium
Harmonization Pathway	N/A	N/A	N/A	Gradual Convergence / Operational Measures	N/A	N/A	Operational Measures and Measurement Alignment	Operational Measures and Measurement Alignment

Table 22. Harmonization Priority and Pathway for Israel – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S	Total Sulphur	Mercaptans
Infrastructure Impact	—	—	—	—	—	High	High	—
Commercial Impact	—	—	—	—	—	High	High	—
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.							
Harmonization Priority	Low	High	Low	High	Low	High	High	High
Harmonization Pathway	N/A	Reporting	N/A	Reporting with aligned measurement units	N/A	Gradual Convergence and Measurement Alignment	Gradual Convergence and Measurement Alignment	Reporting

Table 23. Harmonization Priority and Pathway for Cyprus (Exports via Egypt) – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S	Total Sulphur	Mercaptans
Infrastructure Impact	—	—	—	Medium	—	—	Low	Low
Commercial Impact	—	—	—	Low	—	—	Low	Low
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.							
Harmonization Priority	Low	Low	Low	Medium	Low	Low	Medium	Medium
Harmonization Pathway	N/A	N/A	N/A	Gradual Convergence / Operational Measures	N/A	N/A	Operational Measures and Measurement Alignment	Operational Measures and Measurement Alignment

Table 24. Harmonization Priority and Pathway for Jordan – Gas Analysis

Assessment	Methane	Pentanes / C5+	CO ₂	N ₂	O ₂	H ₂ S	Total Sulphur	Mercaptans
Infrastructure Impact	—	—	—	—	—	High	High	High
Commercial Impact	—	—	—	—	—	High	High	High
Regulatory Complexity	Assessment of regulatory implications is deferred for consideration in conjunction with the subsequent tasks of IG-3.							
Harmonization Priority	High	High	Low	Low	Low	High	High	High
Harmonization Pathway	Reporting	Reporting	N/A	N/A	N/A	Gradual Convergence and Measurement Alignment	Gradual Convergence and Measurement Alignment	Gradual Convergence and Measurement Alignment

4. Key Findings

The prioritization exercise indicates that particular attention should be given to parameters that directly influence system interoperability, operational reliability and market acceptance. In particular, energy-content parameters (HHV/GCV and Wobbe Index), sulphur compounds (H₂S and Total Sulphur) and water-related parameters (Water Content and Dew Points) emerge as the principal areas where greater technical alignment could provide benefits for regional gas trade.

The analysis also demonstrates that not all identified differences require immediate standardization. Many differences can be managed through existing operational practices, LNG processing, blending or broader acceptance ranges. However, differences in units, reference conditions and reporting conventions highlight the importance of aligning measurement and reporting methodologies before considering further convergence of technical specification limits.

Table 25 summarizes the principal findings for each gas quality parameter and the corresponding areas where further technical alignment may be considered.

Table 25. Key Findings by Gas Quality Parameter

Parameter	Key Finding
HHV/GCV	Greater alignment primarily requires common units, reference conditions and clearly defined acceptance criteria rather than infrastructure investment.
Wobbe Index	A key interoperability parameter. Further alignment would primarily concern measurement and reference conditions, gas quality acceptance specifications and, where relevant, LNG blending practices.
Methane	Methane content is generally managed within broader gas quality and interchangeability requirements. Further work should focus primarily on consistent reporting and comparison.
Pentanes / C5+	These components are generally managed through gas processing and conditioning practices. Further standardized reporting would improve cross-country comparability.
CO ₂	The reported CO ₂ specification limits are compatible with the selected destination-market benchmark on the basis of the submitted data. Further work should focus primarily on consistent reporting, units and measurement/reference conditions.
Nitrogen (N ₂)	Initial efforts should focus on consistent reporting methodology, units and reference conditions.
Oxygen (O ₂)	A substantial degree of compatibility is observed among the reported specifications. Further work should focus primarily on completing and standardizing the available data.
H ₂ S	Differences in specification limits, units and measurement conditions indicate a need for greater measurement alignment and, where necessary, consideration of appropriate operational or technical measures.
Total Sulphur	Differences in specification limits and measurement bases indicate a need for greater measurement alignment and, where necessary, consideration of appropriate operational or technical measures.
Mercaptans	Any future alignment should take account of applicable odorization practices, measurement methodologies and network-specific requirements.
Water Content	Further alignment requires more complete reporting using common measurement methodologies and reference conditions consistent with relevant destination-market requirements.
Water Dew Point	Alignment of measurement and reference conditions should precede consideration of convergence in specification limits.
Hydrocarbon Dew Point	Differences in specification limits and pressure conditions indicate a need for consistent measurement conditions and, where relevant, coordinated operational practices.
LNG Density	Primarily relevant to LNG terminal and cargo-acceptance operations. More complete and standardized reporting across participating countries would improve comparability with destination-market requirements.

5. Conclusions

The comparative assessment demonstrates that the participating EMGF countries already share a substantial degree of compatibility in their gas and LNG quality specifications. At the same time, the analysis identifies differences in specification limits, measurement units, reference conditions and reporting practices that may warrant progressive technical consideration in order to facilitate greater regional interoperability and support the development of an increasingly integrated Eastern Mediterranean gas market.

Based on the comparative assessment, the following conclusions can be drawn:

1. **Differences in units and reference conditions represent one of the principal areas requiring further alignment.** This is particularly relevant for producing and potential exporting countries, where comparable measurement bases would facilitate the technical assessment of gas exchanged through regional interconnections and support the preparation of future interconnection and commercial arrangements.
2. **A common EMGF technical reference framework should address both specification values and the conditions under which those values are defined and reported.** This includes units, temperature and pressure reference conditions, measurement methods, tolerances, reporting conventions and arrangements for the management of off-specification gas. Such a framework would serve as a non-binding technical reference and would not supersede applicable national legislation, regulatory requirements, network codes or operator-specific procedures.
3. **Greece and Italy provide important European reference points for the assessment of destination-market compatibility.** Their requirements can support the evaluation of LNG compatibility with established European market practices. Cyprus is additionally considered as a regional LNG import market on the basis of its submitted import specifications.
4. **Different trading and infrastructure pathways may justify different approaches to gas quality management.** Gas destined for Italy and Greece from the Eastern Mediterranean is expected, under the scenarios considered in this assessment, to reach those markets primarily through LNG chains. Liquefaction and associated gas-conditioning processes can provide additional flexibility in managing differences between upstream or pipeline specifications and LNG destination-market requirements.
5. **The immediate priority should be to close remaining data gaps, establish a common unit and reference basis for comparative purposes, and assess the potential development of common technical reference parameters for regional interconnections and LNG trading.** Any subsequent consideration of common specification limits should be undertaken separately on the basis of technical evidence and remain subject to the applicable national assessment and approval processes.

At a strategic level, the findings also demonstrate that regional gas quality harmonization should not be understood as the automatic adoption of a single uniform specification for all countries and parameters. Rather, harmonization can be approached as a progressive and evidence-based process in which different parameters may require different pathways according to their technical characteristics, operational significance and market implications. Some differences may be addressed through measurement and reporting alignment, while others may be managed through operational measures, processing or blending. Where further convergence of specification limits is considered appropriate, this would require separate technical assessment and, where applicable, action through the relevant national processes.

Accordingly, the objective of this study is not to prescribe a definitive regional gas quality specification. Its purpose is to establish a structured technical framework through which potential areas for greater alignment can be systematically assessed, prioritized and

progressively considered as additional technical information and operational experience become available. This approach allows regional cooperation on gas quality to evolve pragmatically while preserving the operational flexibility and national responsibilities associated with the diverse gas systems of the Eastern Mediterranean.

The proposed EMGF Gas and LNG Quality Reporting Template contained in Annex A provides the standardized structure through which additional technical information may be collected, validated and compared. Its use would support greater consistency in future country submissions and provide a common technical basis for subsequent assessments under EMGF Implementation Group 3.

6. Recommended Next Steps

Building on the findings of the comparative assessment and gap analysis, the following next steps are proposed to support the gradual development of a practical and credible regional gas quality harmonization framework. The recommended actions are intended to progress from completion and standardization of the available technical information toward greater comparability of measurement practices, reference specifications and, where appropriate, relevant regulatory and contractual arrangements.

- **Complete and Consolidate the Regional Dataset:** The first priority should be the completion and continuous updating of the regional gas quality dataset. Particular attention should be given to addressing remaining missing, incomplete or ambiguous information and ensuring that the applicable reference conditions and measurement bases are clearly identified.
- **Review and Validate the EMGF Gas and LNG Quality Reporting Template:** The proposed non-binding reporting template in Annex A should be reviewed and validated by participating countries for use in future technical submissions and updates. Its purpose is to provide a common structure for reporting specification values, units, reference conditions, original submitted values, remarks and analytical methods and to facilitate consistent technical comparison among participating countries.
- **Address Data Gaps through Standardized Reporting:** EMGF Member Countries should seek to obtain missing or incomplete gas quality information from the relevant transmission system operators, LNG operators, producers or other competent entities. Future information should be submitted, where practicable, using the structure provided in Annex A and the common reporting conventions technically agreed among participating countries.
- **Align Measurement and Reporting Methodologies:** Before considering convergence of technical specification limits, participating countries should seek greater alignment in the methodologies used to define, measure and report gas quality parameters. This should include standardized reporting units, clearly defined reference temperature and pressure conditions, comparable analytical methods, reporting conventions and calculation procedures.
- **Explore Common Regional Reference Specifications:** Future technical work may assess whether common regional reference parameters could facilitate regional pipeline interconnections and LNG trade. This could include consideration of a minimum technical reference range for regional pipeline interconnections and an LNG export/import compatibility framework. Any future proposal involving common or binding specification limits would require separate technical assessment and, where applicable, approval through the relevant national processes.
- **Assess Relevant Regulatory and Contractual Arrangements:** Future harmonization work should, where relevant, be coordinated with applicable Transmission System Operator codes, LNG terminal operating procedures and other national regulatory frameworks. Subsequent work may also examine contractual approaches for the management of off-specification gas, including rejection rights, blending or processing options, liability allocation, measurement procedures and temporary waivers. Any such arrangements would remain subject to the applicable national, regulatory and commercial frameworks.
- **Maintain a Dynamic Harmonization Framework:** The analytical framework presented in this report should be regarded as a living methodology rather than a one-off assessment. As additional country information becomes available, infrastructure develops and regional gas flows evolve, the comparative assessment, identified gaps and harmonization priorities should be periodically reviewed and updated. This will

help ensure that future work remains evidence-based, transparent and responsive to developments in the Eastern Mediterranean gas market.

Viewed within the broader scope of EMGF cooperation, implementation of these recommendations could support the Forum's objectives of strengthening regional gas security, improving infrastructure utilization and enhancing the competitiveness and market access of Eastern Mediterranean gas. A common technical reference for gas quality can help reduce avoidable technical barriers to cross-border flows, improve LNG compatibility, strengthen confidence among market participants and facilitate the efficient use of existing and planned regional infrastructure.

Over time, greater alignment of gas quality measurement and reporting practices could also support the compatibility of Eastern Mediterranean gas with wider European transmission and diversification initiatives, including south-to-north supply routes such as the Vertical Gas Corridor.

This is particularly relevant in an energy environment shaped by supply-security considerations, changing demand patterns, affordability pressures and increasingly demanding technical and environmental requirements. Continuation of this work should therefore be coordinated, where relevant, with other EMGF activities related to regional gas supply and demand, monetization pathways, infrastructure readiness, regulatory compatibility, emissions performance and market development, while respecting applicable national frameworks and commercial arrangements.

Annex A – EMGF Gas and LNG Quality Reporting Template

Non-binding reporting format for technical comparison with selected European and regional destination-market requirements

The reference values included in this template are provided solely to facilitate technical comparison and standardized reporting. They do not constitute an adopted EMGF regional specification and do not supersede applicable national legislation, regulatory requirements, transmission network codes, LNG terminal procedures, commercial arrangements or operator-specific technical requirements.

Where reference values are included, the applicable market, network code or technical source should be identified. Future submissions should retain the originally reported unit and value in addition to any standardized value used for comparative purposes.

General Information

Field	Information
Country	
Organization	
Date	
Reference Regulation / Network Code / Technical Source	

Pipeline Natural Gas Quality Specifications

Table A.1. Pipeline Natural Gas Quality Reporting Template

Parameter	Reporting Unit	Reference Min	Reference Max	Country Min	Country Max	Original Unit	Original Value	Remarks / Reference Conditions
Gross Calorific Value	MJ/Sm ³	34.95	45.28					
Wobbe Index	MJ/Sm ³	47.31	52.8					
Relative Density	—	0.555	0.700					
CO ₂	mol %		2.5					
O ₂	mol %		0.6					
Hydrogen	vol %		2.0					
H ₂ S	mg/Sm ³		5					
Total Sulphur	mg/Sm ³		20					
Mercaptans	mg/Sm ³		6					
Water Dew Point	°C		-5					Reference condition: 7000 kPa(g)
Hydrocarbon Dew Point	°C		0					Applicable pressure range: 100–7000 kPa(g)
Mercury	ng/Sm ³							
Methane	mol %							
Nitrogen (N ₂)	mol %							
Butanes	mol %							
Pentanes / C5+	mol %							
Minimum Gas Temperature	°C	> 3						
Maximum Gas Temperature	°C		< 50					

Note: The reference values above reflect selected destination-market requirements used in the comparative assessment and should not be interpreted as uniform European or EMGF specification limits. The relevant reference source should be recorded for each future application of the template.

LNG Quality Specifications

Table A.2. LNG Quality Reporting Template

Parameter	Reporting Unit	Reference Min	Reference Max	Country Min	Country Max	Original Unit	Original Value	Remarks / Reference Conditions
LNG Density	kg/m ³							Destination- or terminal-specific requirement to be reported
GCV	MJ/Sm ³							
Wobbe Index	MJ/Sm ³							
Methane	mol %							
Ethane	mol %							
Propane	mol %							
Butanes	mol %							
Pentanes / C5+	mol %							
CO ₂	mol %							
Nitrogen (N ₂)	mol %							
O ₂	mol %							
H ₂ S	mg/Sm ³							
Total Sulphur	mg/Sm ³							
Mercaptans	mg/Sm ³							
Water Content	ppm							
Hydrocarbon Dew Point	°C							
Mercury	ng/Sm ³							

Note: LNG acceptance ranges may differ among terminals and destination markets. Reference limits should therefore be entered together with the applicable terminal, network or contractual source rather than treated as a single uniform regional specification.

Analytical Methods

Table A.3. Analytical Methods Reporting Template

Parameter	Method	Applicable ISO/EN Standard	Remarks
Gas Chromatography / Composition Analysis			
GCV / HHV			
Wobbe Index			
Sulphur Compounds			
Water Dew Point			
Hydrocarbon Dew Point			
Mercury			



East Mediterranean Gas Forum

EMGF Implementation Group 3: Harmonizing Gas Export Regulations

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Towards Export Gas

