Building a Voluntary Near-Zero Intensity Methane Marketplace

International Energy Agency



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Abstract

At the 30th United Nations Climate Change Conference (COP30), 11 countries signed the Statement on Drastically Reducing Methane Emissions in the Global Fossil Fuel Sector, which recognises that demand for low-intensity fuels can drive down emissions and calls for work to be initiated towards the development of a near-zero intensity methane marketplace (NZIMM). Statement signatories have tasked the IEA with assessing the practical elements needed to establish a well-functioning NZIMM.

Based on extensive consultations conducted throughout 2026, this report sets out the IEA's proposed framework to assess, compare and verify upstream methane performance of crude oil and natural gas. The IEA's proposed framework is based on two letter grades that reflect an asset's methane intensity and the accuracy and reliability of the operator's quantified emissions. At the request of Statement signatories, the report also outlines policies that governments could implement to support the development of the NZIMM, covering both the demand and supply sides.

Future work to operationalise the marketplace is proposed to examine how verified performance can be linked to marketed volumes and how performance can be integrated into commercial transactions and pricing structures.

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IEA's recommendations for a voluntary near-zero intensity methane marketplace (NZIMM) for oil and gas

1. Develop a voluntary marketplace for trading near-zero methane oil and gas by establishing a global framework to assess the upstream methane performance of oil and natural gas, leveraging existing initiatives and frameworks.
2. Base this common framework on two key indicators that reflect: (1) methane intensity; and (2) data quality. These two indicators are used to assign each asset a dual-letter grade, ranging from A to F. The two grades must be read in conjunction and disclosed together.

Methane intensity grade

3. Calculate upstream methane intensity at the asset level, covering emissions from production activities.
4. Express intensity on an energy basis, calculated as energy in emitted methane from oil and gas production activities divided by marketed oil and gas (both on a high heating value basis).
5. Define "near-zero" as an upstream methane emissions intensity below 0.1% (using the IEA's recommended energy-based formula). An intensity below this benchmark is eligible for A and B grades.

Data quality grade

6. Develop a data quality grade that reflects the reliability of the reported emissions intensity, building on OGMP 2.0's five reporting levels and other relevant frameworks.
7. Ensure that the dual grades are verified by an accredited independent third-party with demonstrated technical expertise. Operators that self-report emissions intensities without verification automatically receive a grade of F for data quality.

Government actions

8. Governments can support the development of the marketplace by establishing credible foundations for its operation and by incentivising both the supply of, and demand, for near-zero oil and gas. The proposed framework is designed to be interoperable with existing regulatory requirements, but participation in the marketplace is voluntary, and the nature and extent of government engagement will vary according to national priorities and circumstances.

Additional steps to support market operation

9. Establish a Working Group composed of relevant stakeholders to take forward and finalise the NZIMM framework, drawing on the recommendations set out in this report. The Working Group can refine the IEA's proposed framework and will define the technical parameters underpinning the methane intensity and data quality grades to ensure consistent and credible application across producers.

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Executive summary

Global oil and gas methane emissions remain stubbornly high. Oil and gas activities account for a substantial part of human-caused methane emissions, and these emissions have shown no signs of slowing in recent years. According to IEA analysis, more than 80 million tonnes (Mt) of methane were emitted from oil and gas operations in 2025. Most of these emissions can be avoided with existing technologies (77%), often at no net cost.

Demand for "near-zero" methane fuels could spur emissions reductions while strengthening energy security. Oil and gas are heavily traded commodities. Buyers in major importing economies can influence emissions by prioritising fuels with lower methane intensities. According to IEA analysis, if buyers in major importing economies were to demand fuels with an upstream methane intensity of 0.1% or less – equivalent to around 0.1 kg methane per barrel of oil equivalent (kg CH_4/boe) – this could reduce global methane emissions by around 17 Mt, equivalent to one quarter of global upstream oil and gas emissions. These reductions could also unlock an additional 36 billion cubic metres (bcm) of gas supply, strengthening energy security in importing countries.

Creating demand signals for near-zero methane fuels starts with a common global framework for assessing upstream methane performance. Transparency on methane emissions has improved in recent years, supported by new technologies and several reporting frameworks. However, many operators still do not quantify their methane emissions, while those that do typically report only company-level totals, with limited asset-level granularity. Buyers often lack sufficient confidence in reported emissions data, as many inventories are neither informed by direct measurement nor subject to third-party verification. Furthermore, differences in the methodologies and approaches used by operators limit comparability across fuel sources. A common global framework for assessing methane performance would enable buyers to better identify lower-intensity supplies and strengthen demand signals for producers to reduce methane emissions.

Framework for the near-zero intensity methane marketplace

This report lays out the IEA's proposed global framework for assessing upstream performance. Thirteen countries have endorsed the Statement on Drastically Reducing Methane Emissions in the Fossil Fuel Sector, which calls for work to be initiated towards the development of the near-zero intensity methane

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marketplace (NZIMM). At the request of the Statement signatories, the International Energy Agency (IEA) has prepared this report to examine what is needed to develop a global NZIMM.

The IEA conducted extensive consultations throughout July 2026 with a range of stakeholders, including producers, buyers, service providers, governments, international organisations and civil society organisations to inform its recommendations. Informed by feedback received from stakeholders, the IEA's proposed framework is based on two letter grades, each ranging from A to F, that are assessed at asset level. The first letter grade reflects the asset's methane intensity, providing buyers with a clear understanding of the asset's methane performance. The second letter grade reflects the accuracy and reliability of the operator's quantified emissions, providing buyers with a sense of the degree of trust that can be placed in the disclosed methane intensity. The two letter grades are always to be disclosed together; it is not possible to only disclose one.

Methane intensity

Calculating a methane intensity grade requires clear and consistent system boundaries. The IEA recommends that the NZIMM focus first on emissions from production activities, where the greatest potential for emissions reductions lies. Its scope could be extended to gathering, compression and processing and to the downstream sector at a later stage, once the viability of a marketplace for production activities has been well demonstrated.

A common intensity formula is essential to ensure comparability across assets and operators. Methane intensity is recommended to be calculated on an energy basis, expressed as the energy content of methane emissions (in joules) divided by total marketed oil and gas energy (in joules). This approach avoids reliance on a gas-only denominator (as used by several organisations today), which could disadvantage oil-focused assets. It also enables the application of a single formula to calculate the emissions intensity of crude oil and natural gas production.

A grading scheme provides clarity for buyers while creating incentives for operators to improve methane performance. Drawing on approaches used in other sectors, a grading system is recommended to be used to score intensity. A grading system enables buyers to assess the operational methane performance of individual assets, while limiting the need to disclose commercially sensitive information. In parallel, a common near-zero methane intensity benchmark of 0.1% (calculated using the IEA's recommended definition of intensity) is recommended to be established. This benchmark is informed by IEA analysis regarding the level of emission reductions that are technically feasible today, as

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well as current company- and country-level performance. Establishing such a benchmark would help build a shared understanding of what constitutes near-zero methane intensity among producers, buyers, governments and investors.

Data quality

Reporting a data quality score alongside the emissions intensity score provides confidence to buyers on the intensity of the oil and gas they purchase. An A-to-F grading scale is proposed for data quality, based on three indicators: (i) the methodology used to quantify emissions, drawing on the five reporting levels established under UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0); (ii) the frequency of site-level measurements; and (iii) the coverage of site-level measurements. The grading scale has been designed to reflect current industry practices, thus ensuring that the requirements remain practically achievable for operators.

Independent third-party verification is needed to foster trust for buyers. Methane emissions data are currently not systematically subject to independent verification, which can undermine buyers' confidence in the accuracy and credibility of reported figures. Under the proposed framework, operators that do not undergo independent third-party verification automatically receive an F grade for data quality. To ensure the robustness and credibility of the verification process, verification bodies must be independent from the operator, its equity partners and any service provider involved in the quantification. They must also demonstrate sufficient technical expertise in methane emissions quantification and management. Independence, impartiality and competence can be ensured by requiring verification bodies to hold accreditation from a recognised national accreditation body or government regulator.

Alignment with existing regulatory and voluntary frameworks can accelerate development of the NZIMM. Many frameworks and initiatives have emerged in recent years that require or encourage operators to improve transparency on methane emissions and adhere to high standards of measurement, reporting and verification, including OGMP 2.0 and the European Union Methane Regulation (EUMR). The data quality framework has been designed to foster alignment with existing regulatory and voluntary frameworks, including OGMP 2.0 and the EUMR. To facilitate interoperability between the NZIMM framework and the EUMR, a dedicated data quality pathway is proposed to be created. Operators that comply with EUMR standards on measurement, regulation and verification automatically receive a grade of B for data quality under the NZIMM framework – though operators can always improve this score through the methodology proposed under the IEA's data-quality framework.

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The role of governments and future work

The IEA framework is designed to be voluntary, but government policies can accelerate the development of a global marketplace for near-zero methane fuels. Government support could help broaden market participation and strengthen the marketplace's potential to drive emissions reductions. At the request of the signatories to the Fossil Fuel Statement, this report presents a range of policy options that governments could implement to support the development of the NZIMM. These options cover measures on both the supply and demand sides, although they remain entirely at the discretion of individual governments, in line with national circumstances and priorities. The policy options are intended to inform government decision making; the development of the NZIMM does not depend on their adoption.

Further work is needed to operationalise the marketplace. This report focuses on the foundational question of how to assess and compare upstream methane performance across assets. It does not address the mechanisms through which market participants could transact, retire and claim volumes of low-intensity oil and gas. Future work can examine how verified performance can be linked to marketed volumes and how performance can be integrated into commercial transactions and pricing structures. Addressing these operational considerations will be crucial for building an effective global NZIMM. To advance this work, the establishment of a Technical Working Group (TWG) is recommended. The TWG would support the finalisation of the proposed framework and examine operational issues in greater detail.

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Introduction

At the 30th United Nations climate change conference (COP30), held in Belém, Brazil, in November 2025, 11 countries signed the Statement on Drastically Reducing Methane Emissions in the Global Fossil Fuel Sector (hereafter, Fossil Fuel Statement). Two additional countries, Nigeria and Vanuatu, subsequently joined as signatories in June 2026. The Statement calls for closer collaboration between fossil fuel producing and consuming countries to reduce methane emissions. It also proposes initiating work to develop a near-zero intensity methane marketplace (NZIMM).

The signatories to the Fossil Fuel Statement have created two technical workstreams for the Statement's implementation: Workstream 1 focuses on the NZIMM, while Workstream 2 focuses on strengthening shared responsibility between producing and consuming economies. In March 2026, the International Energy Agency (IEA) was designated as the lead organisation for Workstream 1, with the United Nations Environment Programme's (UNEP) International Methane Emissions Observatory (IMEO) as a strategic partner. The IMEO is also leading Workstream 2, alongside the UNEP's Climate and Clean Air Coalition (CCAC).

In its role as lead organisation for Workstream 1, the IEA has been tasked with assessing the practical elements needed to establish a well-functioning NZIMM. The IEA has been guided by two key principles: enabling producers to differentiate their fossil fuel supply by emissions performance and ensuring that reported emissions are sufficiently credible and comparable for buyers.

Throughout July 2026, the IEA conducted a series of stakeholder consultations on marketplace design to help identify the key elements of an effective global framework. These consultations highlighted that an effective global voluntary marketplace for near-zero methane oil and gas depends on a shared understanding of the standards, definitions and methodologies used to assess emissions performance. A shared understanding can help establish a common basis for market transactions and facilitate participation by producers and buyers across different jurisdictions.

Stakeholder feedback also highlighted that while several reporting and differentiation frameworks are already in use, differences in their approaches can make it difficult to compare emissions performance consistently across countries, companies and assets. A common global framework could improve comparability, help buyers identify lower-intensity supplies and support a more transparent marketplace. Over time, this could facilitate price discovery by enabling buyers to reflect differences in emissions performance in their purchasing decisions,

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potentially creating a price premium for oil and gas with lower methane intensities. Such a premium could provide an additional commercial incentive for producers to invest in methane-abatement technologies.

This report proposes a comprehensive framework to strengthen alignment between buyers and sellers and facilitate the assessment, comparison and verification of upstream methane performance. It sets out a common approach for calculating and grading methane intensity, including how to define “near-zero” intensity, alongside a data-quality framework for communicating the reliability of emissions estimates. The framework is grounded in the principles of transparency, comparability and reliability, while balancing producers’ ability to differentiate their supplies in practice with buyers’ need to trust reported emissions levels.

To minimise duplication and facilitate implementation, the proposed NZIMM framework is designed to be interoperable with existing methane transparency and accounting initiatives, including voluntary initiatives such as UNEP’s Oil and Gas Methane Partnership (OGMP) 2.0 and regulatory frameworks such as the European Union’s Methane Regulation. It could also inform future regulatory developments, for example the European Commission’s methodology for calculating producer-level methane intensity for imported fuels, due to be published by August 2027.

The IEA’s analysis is built on the principle that participation in the market is voluntary. Nonetheless, at the request of the Fossil Fuel Statement signatories, the report includes a menu of policy options that governments can implement to encourage the development of a global NZIMM. Such measures can help establish a credible foundation for the marketplace and support the development of both supply and demand for near-zero oil and gas. However, their implementation is entirely at the discretion of individual governments, in line with national circumstances and priorities. The policy options are intended only to inform government decision making; the development of the NZIMM does not depend on their adoption.

Addressing energy-related methane emissions globally will also require tackling emissions from coal, but this report focuses exclusively on oil and gas supply chains. Coal supply chains will be considered in a subsequent phase of work. The report also does not address the mechanisms through which market participants could transact, retire and claim volumes of low-intensity oil and gas. The IEA recommends that a Technical Working Group (TWG) be established to examine how verified performance can be linked to marketed volumes and how performance can be integrated into commercial transactions and pricing structures. Addressing these operational considerations will be crucial for building an effective global NZIMM.

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This report, and the framework contained within, are the sole responsibility of the IEA. The report is structured as follows: Chapter 1 discusses the motivation for establishing a global NZIMM, the factors needed to establish confidence in it, and the IEA's proposed framework for the marketplace. Chapter 2 outlines the IEA's proposed methane-intensity grading system, including system boundaries, the appropriate intensity formula, the meaning of "near-zero" and the grading scale. Chapter 3 sets out a data-quality framework, including a proposed approach to grading, criteria for third-party verification and options for data disclosure. Chapter 4 proposes a set of policies that governments can implement to support the NZIMM and ensure a well-functioning marketplace. Chapter 5 concludes with a series of recommended next steps for the development of the NZIMM.

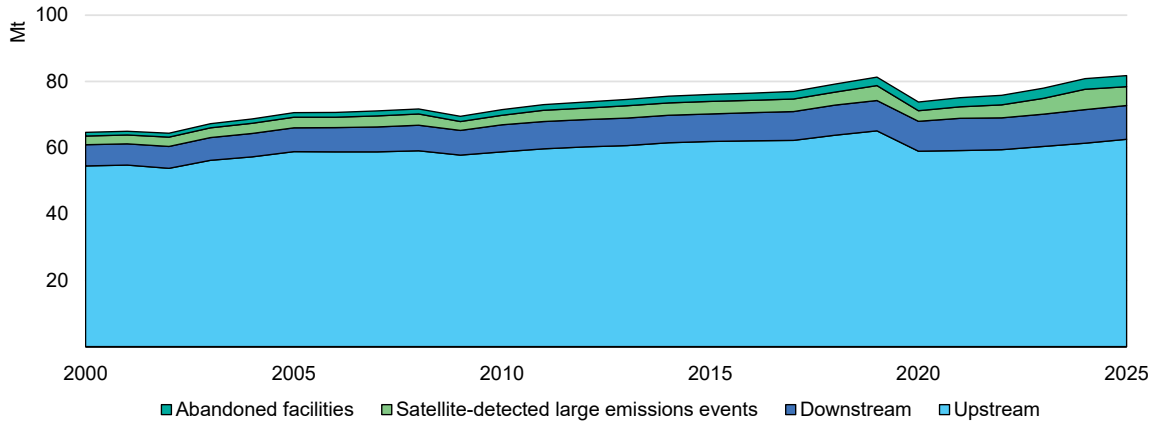
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Chapter 1. Harnessing market forces to reduce global methane emissions

Methane emissions from oil and gas activity remain stubbornly high worldwide

Methane is the second-biggest contributor to global warming after carbon dioxide (CO_2). It absorbs outgoing heat, trapping it in the atmosphere through a process known as radiative forcing. Atmospheric methane concentrations today are 2.7 times higher than they were before the Industrial Revolution (1850-1900), and methane is responsible for nearly 30% of the rise in global average temperatures since that era began.

Figure 1.1 Methane emissions from oil and gas operations, 2000-2025



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Note: Mt = million tonnes.

Although methane remains in the atmosphere for a relatively short time – around 12 years, as opposed to centuries for CO_2 – it is much more efficient at trapping heat. Its global warming potential (GWP) is therefore much higher, particularly over the short term. Curbing methane emissions can therefore significantly slow the pace of global warming in the coming decades.[1] Cutting emissions before

[1] One tonne of methane is considered to be equivalent to 82.5 tonnes of CO_2 on a 20-year timescale (GWP20) and 29.8 tonnes of CO_2 on a 100-year timescale (GWP100).

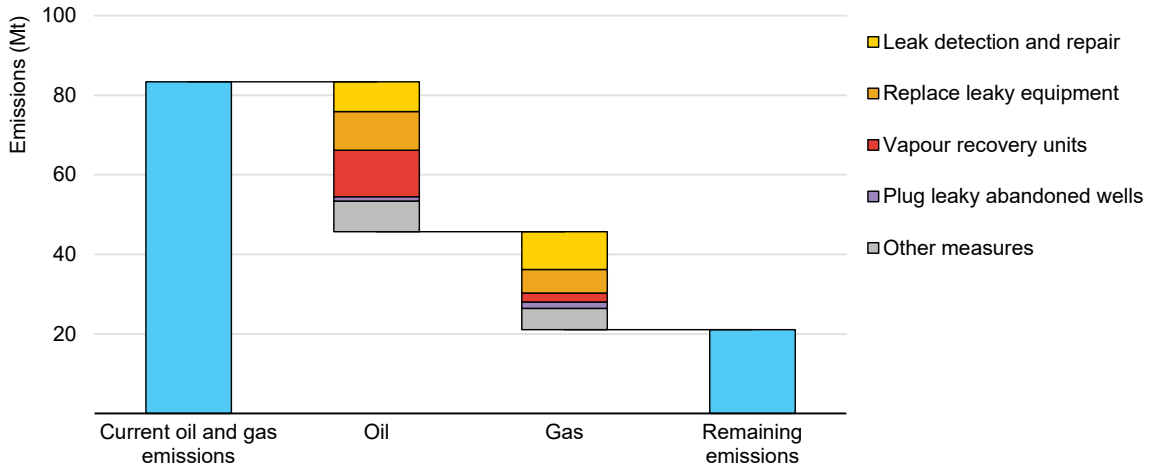
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2030 would help limit the extent to which temperatures exceed 1.5 °C above pre-industrial levels, the long-term threshold set by the 2015 Paris Agreement.

The most recent comprehensive assessment of methane emissions published in the Global Methane Budget puts current global methane emissions at around 610 million tonnes (Mt) per year. About two-thirds of that comes from human activity, with the remainder from natural sources. IEA estimates put 2025 methane emissions from oil and gas operations at around 80 Mt, or around 20% of human-caused emissions (Figure 1.1).

Oil and gas methane emissions are concentrated in a handful of countries. According to IEA analysis, the 10 largest emitters account for 70% of the global total, with the United States, the Russian Federation (hereafter, 'Russia') and Iran as the top three, respectively. Upstream activities account for by far the largest share of emissions along the value chain, at 80% globally, although the share attributable to downstream activities varies across countries and supply chains. Upstream emissions arise from fuel extraction, gathering systems and processing facilities – both onshore and offshore. Targeting upstream operations in a small number of countries could therefore deliver substantial reductions in global methane emissions.

Figure 1.2 Potential to lower oil and gas methane emissions using existing technologies, 2025



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Notes: Mt = million tonnes. Emissions cover the entire value chain, including both upstream and downstream activities. Where no other information is available, methane emissions from satellite-detected large emitters are split equally between oil and natural gas.

IEA analysis suggests that existing technologies and measures could avoid 77% of oil and gas methane across the full value chain – around 63 Mt – with no technological breakthroughs needed (Figure 1.2). Many of these can be deployed at no net cost, as the market value of the additional gas captured and sold exceeds

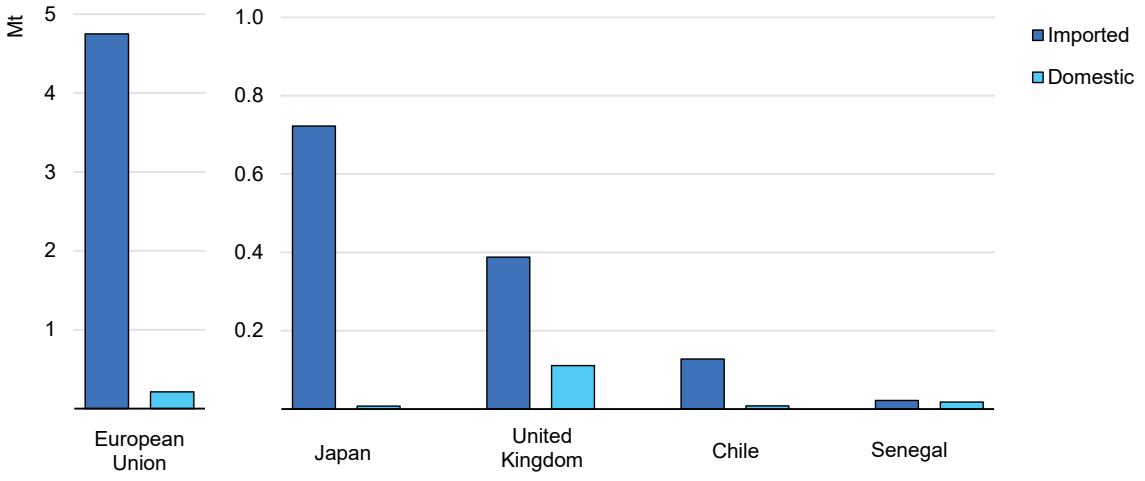
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the cost of abatement. At 2025 energy prices, around 40% of full value chain emissions could have been avoided at no net cost. Abatement can be particularly cost-effective where gas infrastructure and export capacity are already in place, allowing captured gas to be brought to market without the need for new projects that risk locking-in the use of more fossil fuels.

In major importing economies, imported emissions often far exceed domestic ones

Oil and gas are among the world's most heavily traded commodities: more than 40% of crude oil and 25% of natural gas is traded internationally. For many importing economies, this means that much of the methane tied to the fossil fuels they consume is emitted abroad, not within their borders. In net-importing economies that have endorsed the Fossil Fuel Statement, upstream emissions tied to imported crude oil and gas reached 6 Mt in 2024, dwarfing the 0.4 Mt from domestic production (Figure 1.3).

Figure 1.3 Upstream oil and gas methane emissions among net-importing endorsers of the Fossil Fuel Statement, 2024



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Notes: Mt = million tonnes. Imported emissions include only the upstream emissions associated with crude oil and natural gas imports; upstream emissions tied to imported oil products are excluded.

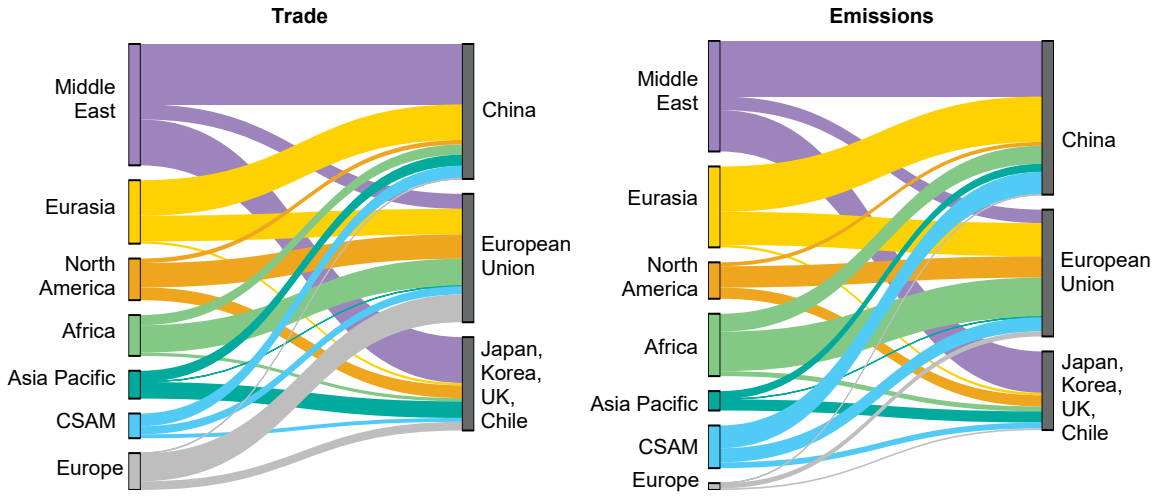
Upstream methane intensity varies widely across oil and gas producing economies. Accordingly, for importing economies, the emissions intensity of fuels consumed at home depends in part on the performance of their international suppliers. IEA analysis shows that some producing regions account for a small share of trade flows, but a disproportionately large share of methane emissions associated with those flows (Figure 1.4). Conversely, some producing countries,

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including Norway, account for a large share of trade flows but a much smaller share of emissions, reflecting their low upstream emissions intensity.

Among importers that have endorsed the Fossil Fuel Statement, the IEA estimates that the average upstream methane intensity of imported fuels is 0.8%.[2] Average intensities are 0.8% for the European Union, 0.6% for the United Kingdom, 0.5% for Japan, and 1.1% for Chile.[3] Among major importing economies that have not signed the Statement, average upstream intensities stand at 0.6% for Korea, below 1% in Singapore and Thailand, and just over 1% in both the People's Republic of China (hereafter 'China') and India.

Figure 1.4 Oil and gas trade flows and associated methane for selected importers, 2024



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Notes: UK = United Kingdom. CSAM = Central and South America. The trade flows (left) correspond to the volumes of crude oil and natural gas exported from producing regions to selected consuming economies. The emissions flows (right) correspond to the emissions associated with exported volumes, based on the exporting country's upstream average intensity. Europe's contribution consists mainly of oil and gas exports from Norway, with smaller contributions from other non-EU countries (including Türkiye, Israel* and Albania). Asia Pacific excludes China, Japan and Korea. *The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

[2] Methane intensities are calculated here in energy terms as total methane emissions from upstream operations divided by marketed oil and gas production. See Chapter 2 for a discussion of the definition of methane intensity.

[3] Intensities are based on estimates of overall upstream emissions intensity in exporting countries. They do not account for differences between oil and gas types (e.g. natural gas and LNG), or the possibility that imports originate from specific assets with lower emissions intensities. As a result, the estimates may be conservative in some cases. For example, analysis conducted under the Coalition for LNG Emission Abatement toward Net-Zero (CLEAN) estimates that the average upstream methane intensity of Japan's LNG imports is 0.15%.

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A marketplace for near-zero fuels can benefit producers, buyers and governments alike

Because crude oil and natural gas are traded internationally, buyers in importing economies can help lower emissions by addressing the emissions intensity of the fuels they purchase. Demand for near-zero methane fuels is emerging in some regions, but the market remains limited. A global voluntary marketplace, built on a common framework that provides credible, consistent and comparable information, could help expand demand and benefit multiple stakeholders.

A voluntary near-zero intensity methane marketplace (NZIMM) would allow **oil and gas producers** with low methane emissions to differentiate their products from those with higher emissions intensity. Many companies, including members of the Oil and Gas Climate Initiative (OGCI), have made progress in reducing operational methane emissions in recent years. Differentiation could give these producers a competitive advantage, helping them to attract new customers interested in purchasing fuels with lower embedded emissions. Over time, it could also support price premiums that allow producers to recoup their investments in methane-abatement technologies. At the same time, the prospect of gaining access to new customers could also encourage higher-emitting producers to cut their emissions, reducing the sector's overall methane footprint.

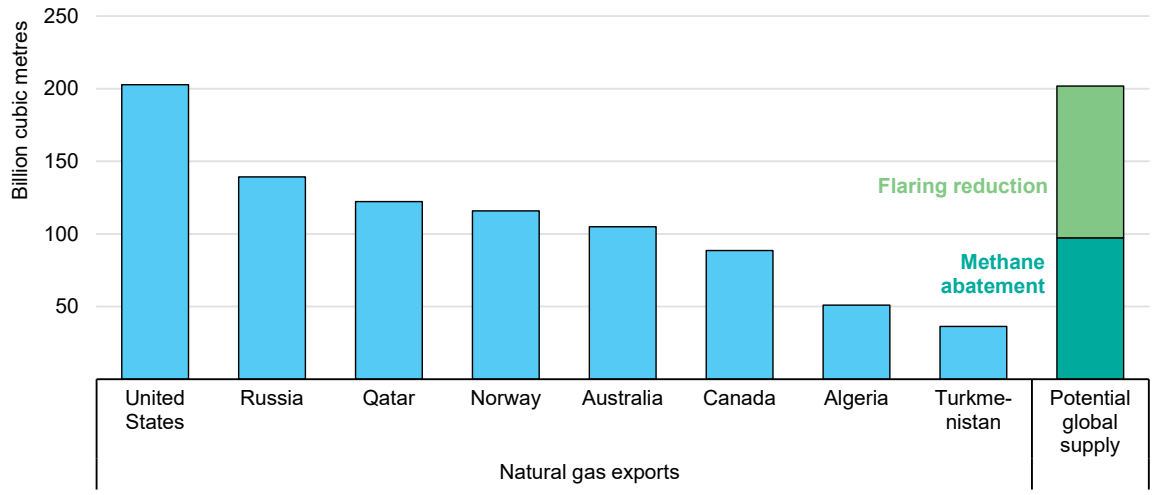
Many **oil and gas purchasers** have also committed to reducing greenhouse gas (GHG) emissions associated with their activities or achieving net zero emissions by a specified date. These include technology firms, data centres, artificial intelligence (AI) companies, and industrial companies that use natural gas as a feedstock. A differentiated market can help purchasers better understand the environmental impacts of the oil and gas they buy. By choosing lower-intensity fuels, companies can reduce the lifecycle emissions associated with their products and services, helping them meet voluntary emissions-reduction targets. Such choices can also showcase their commitment to lowering GHG emissions across their supply chains, bolstering their reputations.

For **oil and gas producing countries**, a voluntary marketplace can allow domestic producers to differentiate their oil and gas based on methane intensity, creating an incentive for producers to reduce emissions. This differentiation could accelerate industry action on methane abatement and encourage wider deployment of abatement technologies. Lower methane emissions could, in turn, reduce countries' overall domestic GHG emissions, helping them meet emissions-reduction commitments, including those under the Global Methane Pledge and Nationally Determined Contributions (NDCs) under the Paris Agreement. Action by operators to reduce methane emissions can also deliver wider benefits. Capturing gas that would otherwise be lost can increase total domestic energy supply and reduce local air pollution, improving both energy security and worker productivity.

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For **oil and gas importing countries**, the NZIMM would not directly help them meet domestic GHG reduction targets, such as those set out in their NDCs, because the reductions would occur outside their borders. However, many energy importers now recognise that their fossil fuel consumption contributes to global emissions and have expressed an interest in reducing emissions associated with their imports. In 2022, several countries[4] signed a joint declaration urging energy importers to "take steps to reduce the methane emissions associated with their energy consumption". The European Union has also introduced binding requirements for importers to disclose the methane intensity of imported fuels and comply with a maximum methane intensity threshold. A marketplace could help buyers identify lower-emissions oil and gas and prioritise these supplies. This would help importing countries lower the emissions associated with their energy consumption. It would also reduce gas waste and enhance energy security. According to IEA analysis, a global effort to cut methane emissions from oil and gas operations could unlock nearly 100 billion cubic metres (bcm) of natural gas per year, with a further 100 bcm available through the elimination of non-emergency flaring worldwide – more than the annual gas exports of major producing economies (Figure 1.5).

Figure 1.5 Natural gas exports from selected economies compared with potential supply from reducing flaring and methane emissions globally, 2024



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Note: Figure compares the volume of gas exported from selected countries (blue) and the amount of additional gas that could be obtained through flaring reduction and methane abatement at the global level (green).
Source: : IEA analysis based on data from IEA (2026), Global Methane Tracker 2026.

[4] Canada, the European Union, Japan, Norway, Singapore, the United Kingdom and the United States.

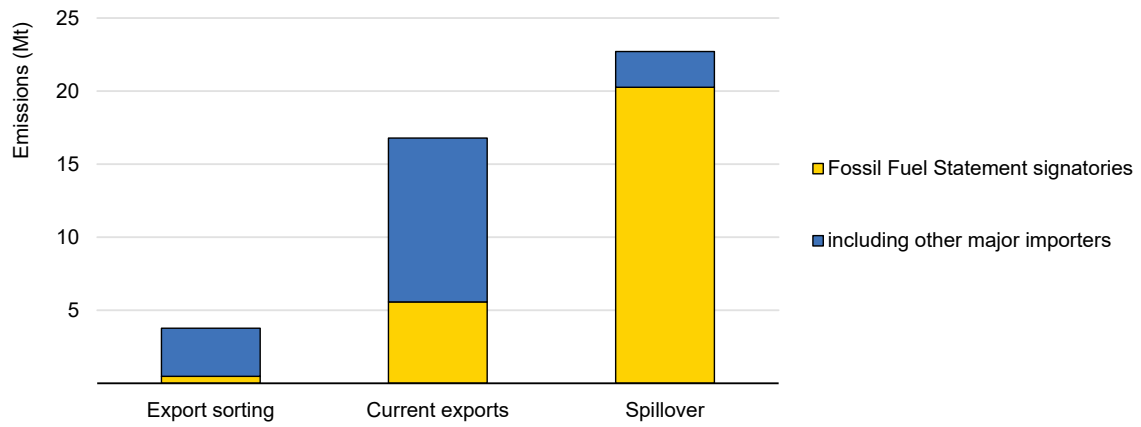
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Demand for near-zero fuels could reduce global upstream emissions by up to 35%

Large reductions in methane emissions from oil and gas operations are technically feasible and often cost-effective, but adoption of abatement technologies has been slow. Several factors may explain this, including constraints on upfront capital, particularly for national oil companies (NOCs); limited access to abatement technologies, especially in developing economies; gaps in awareness within firms; and competing investment priorities.

Because crude oil and natural gas are traded internationally, buyers can help reduce global emissions by favouring lower-emissions supplies. Stronger demand for near-zero methane oil and gas could give producers a commercial incentive to cut operational emissions, speeding the adoption of abatement technologies and delivering further reductions.

Figure 1.6 Potential emission reductions under different import demand scenarios for near-zero methane fuels, 2024



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Notes: Mt = million tonnes. "Other major importers" includes Korea, China, India, Singapore, Chinese Taipei and Thailand. "Export sorting" assumes exporters reallocate existing production with an upstream methane intensity of 0.1% or less to selected importing countries, reducing emissions only when existing low-intensity production is insufficient to meet demand. "Current exports" assumes exporters reduce the upstream emissions intensity of 2024 export volumes to 0.1% (for the selected importing countries only), assuming that current exports have an intensity equal to the national average in the exporting country. "Spillover" assumes exporters reduce the upstream methane intensity of all exports to 0.1%, regardless of destination. Emission reductions attributed to Fossil Fuel Statement signatories are greater under the "spillover" scenario, because this scenario assumes that exporting countries reduce emissions intensity across all exports. Some exporters may supply both signatories and non-signatories, meaning that emissions reductions associated with non-signatories would already be covered by reductions associated with signatories. The "spillover" scenario therefore captures the *additional* emissions reductions beyond those attributable to Fossil Fuel Statement signatories. Potential emissions-reduction estimates are based on 2024 trade and emissions intensity data.

The IEA has modelled the potential impact of commercial buyers in selected economies choosing to switch to oil and gas with a methane intensity of 0.1% or less. If commercial buyers in net-importing economies that have endorsed the

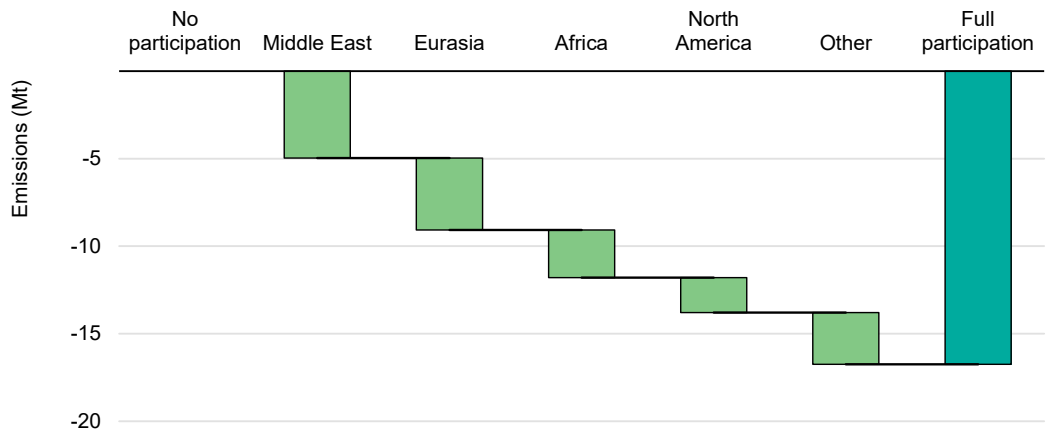
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COP30 Fossil Fuel Statement were to demand fuels with a methane intensity of 0.1% or less, global upstream methane emissions could fall by almost 6 million tonnes (Mt), or 10% of 2024 levels (Figure 1.6). (This finding assumes that current exports have an intensity equal to the national average in the exporting country and the emissions intensity of exported volumes is then cut to 0.1%.)

Additional reductions could be achieved if buyers in other major importing economies also sought near-zero methane fuels. China and India are the world's largest crude oil importers, and China is also the largest importer of liquefied natural gas (LNG). If fossil fuel importers in China, India, Korea, Singapore, Chinese Taipei and Thailand also demanded oil and gas with a methane intensity below 0.1%, global emissions could fall by a further 11 Mt, including nearly 7 Mt from imports into China alone.

In total, voluntary demand for near-zero methane fuels across all major importing economies could cut global upstream oil and gas methane emissions by around 17 Mt, or 25%. The reductions would be spread across production in several regions, with the largest reductions coming from the Middle East and Eurasia (Figure 1.7).

Figure 1.7 Potential methane reductions by region under a voluntary near-zero marketplace involving all major importers, 2024



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Notes: Mt = million tonnes. Based on "current exports" case, which assumes that exporters reduce the emissions intensity of volumes exported in 2024 to 0.1%. Reductions are based on a scenario where all major importing economies (Fossil Fuel Statement signatories as well as other major importing economies) participate in the marketplace. The intensity assigned to exported volume is based on the exporting country's average upstream intensity, as estimated by the IEA. Other includes non-EU Europe, Central and South America and Australia, New Zealand, Indonesia, Korea, and other Southeast Asia.

The scale of emissions savings depends on how exporters respond to demand for near-zero fuels. If existing near-zero supply exceeds demand, exporters could simply redirect this supply to buyers in importing economies and sell higher-intensity production elsewhere, yielding no new emissions reductions. In this case

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(i.e., the “export sorting” scenario in Figure 1.6), the reductions could be an order of magnitude lower. This risk would diminish, however, if demand for near-zero oil and gas grows and outstrips existing near-zero supply, giving producers a commercial incentive to reduce emissions at more assets.

By contrast, if exporting countries extend abatement measures to all exports, regardless of destination, to meet the near-zero methane threshold, global upstream oil and gas methane emissions could fall by around 23 Mt, or 35% of 2024 levels. Given that a lot of crude oil and natural gas is also sold domestically within producing countries, emission reductions could be greater still if domestic buyers also prioritised oil and gas with a methane intensity of 0.1% or less.

Choosing lower-intensity products could also strengthen energy security for importing countries. Large volumes of natural gas are currently wasted through methane leaks, flaring and venting from oil and gas operations. Not all of this gas can be recovered: the scope for doing so depends on available infrastructure, the asset’s characteristics and location, and access to markets. But where conditions allow, reducing flaring, leaks and venting can bring substantial additional supplies to market. If countries supplying the importing economies listed above were to cut flaring and methane emissions across all their exports, an estimated 36 bcm of additional gas could be made available to importers – roughly equivalent to Turkmenistan’s total exports in 2024. The additional gas captured can help mitigate the impact of supply disruptions in specific producing countries. Reducing methane emissions and flaring can therefore deliver a double dividend: lower GHG emissions alongside greater energy security.

Key elements of a global voluntary marketplace

Developing a global voluntary marketplace requires a globally consistent framework for assessing and comparing the upstream methane performance of different fuel sources. While a number of reporting and differentiation frameworks have already emerged and are currently in use, a common approach could deliver greater emissions reductions by enabling consistent assessments across countries and companies. Such a framework should, however, be designed to be interoperable with existing initiatives, avoiding duplication and speeding market development.

Throughout July 2026, the IEA conducted a series of virtual consultations on marketplace design with five different stakeholder groups: oil and gas producers; fossil fuel buyers; third-party service providers (e.g. auditing firms, certification bodies and data providers); civil society organisations and academia; and governments and regional organisations. In total, these sessions involved more

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than 85 participating organisations across 33 countries. Stakeholders also had the opportunity to submit feedback in writing until the end of August.

The IEA's consultations have helped identify the key elements of an effective global framework. Stakeholders repeatedly highlighted several issues that would need to be addressed to develop a global near-zero intensity methane marketplace (NZIMM). Some of these issues remain unresolved, limiting the market's potential to deliver further emissions reductions.

Transparency

For a marketplace to function effectively, buyers need access to reliable emissions data. Transparency on methane has improved in recent years, thanks in part to initiatives such as the United Nations Environment Programme's Oil and Gas Methane Partnership (OGMP) 2.0, which now includes more than 160 participating companies covering 43% of global oil and gas production. But significant gaps remain and many producers still do not quantify or disclose methane emissions from their operations.

Even companies that do disclose operational emissions (through OGMP 2.0 or as part of corporate sustainability reports) generally only disclose company-wide totals rather than breakdowns by region or asset. Buyers are therefore unable to assess the emissions associated with fuels originating from specific regions or assets, potentially limiting their ability to favour better-performing assets. Initiatives such as OGMP 2.0 also do not collect activity data, such as production volumes or throughput, making it harder for buyers to calculate and compare methane intensities consistently.

Transparency constraints can be explained by a range of legal, commercial and practical factors. Operators worry that disclosing granular asset-level data can allow competitors or buyers to infer commercially sensitive information about production. Laws in some jurisdictions may restrict the disclosure of emissions or production data, limiting producers' ability to share it with buyers. Other potential obstacles include the terms and conditions of joint-venture arrangements, confidentiality obligations, data ownership and access rights, and reliance on third-party gathering and processing infrastructure. A global marketplace will need to address these constraints while allowing buyers to meaningfully distinguish producers' methane performance. Standardised performance grades, for example, could communicate relative performance without revealing commercially sensitive information (see Chapter 2).

Comparability

Buyers also need to be able to compare the emissions performance of different fuel sources on a consistent, like-for-like basis. But the current landscape of

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methane initiatives and frameworks remains fragmented (see Table 1.1), with multiple approaches to measurement, reporting and verification (MRV). These initiatives use different methodologies, scopes, definitions, boundaries and grading systems, reflecting their differing objectives.

Table 1.1 Overview of methane-related transparency initiatives and frameworks

Category	Type	Focus	Examples
Voluntary initiatives	Corporate reporting initiatives	Increase transparency by disclosing methane emissions at company-level, including sources and mitigation efforts	• UNEP's Oil and Gas Methane Partnership 2.0 • Oil and Gas Climate Initiative • Corporate sustainability reports
	Supply chain protocols	Provide a structured framework that seeks to support consistent measurement, monitoring and reporting of methane emissions along the supply chain, facilitating a full lifecycle analysis of delivered oil and gas	• Natural Gas Sustainability Initiative (NGSI) Protocol • GTI Veritas Protocol • ONE Future Protocol
	Certification schemes	Differentiate low-intensity supply through independent third-party verification of emissions and issuance of certificates	• MiQ • Cheniere Energy's Cargo Emissions Tags • Project Canary (ceased certification operations in 2024) • Context Labs • Attributes
	Buyer-led transparency initiatives	Foster transparency by encouraging suppliers to submit emissions data to buyers at asset-level for the LNG value chain	• Coalition for LNG Emission Abatement Toward Net-Zero (CLEAN)
	Industry standards	Establish technical guidelines to promote consistency across the industry for specific technical activities	• Upcoming ISO/CEN standards on methane quantification, measurement, reporting and verification
Policies	Corporate disclosure mandates	Increase transparency by requiring companies to disclose their methane emissions at company-level	• EU Corporate Sustainability Reporting Directive • UK Climate-Related Financial Disclosures (CRFD)
	Import standards	Establish MRV requirements for imported fossil fuels, including mandatory reporting of emissions intensity and a maximum intensity threshold for imported fuels	• European Union Methane Regulation (Chapter 5)
	Domestic MRV standards	Require domestic producers to measure, report and verify methane emissions	• European Union Methane Regulation (Chapter 3) • Alberta MRV standards

Notes: The Oil and Gas Methane Partnership (OGMP) 2.0 also encourages companies to disclose asset-level emissions, though this is not a condition of participation. The initiatives listed here are provided as examples and should not be understood as an endorsement of particular schemes or frameworks.

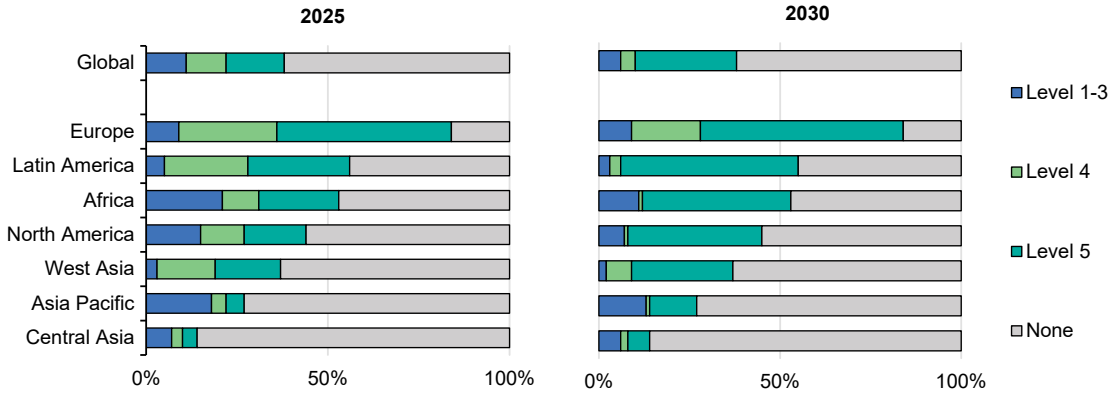
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This fragmentation makes it difficult for buyers to assess emissions performance consistently and compare producers and assets. It also means that there is no common understanding among producers, buyers and governments of what constitutes "near-zero" intensity. Without comparability, buyers may struggle to identify and choose lower-intensity fuel sources, limiting the ability of high performers to be rewarded for their abatement efforts.

Reliability

Buyers need to have confidence in the emission levels reported by sellers, but the reliability of reported emissions remains a concern. Emissions disclosed in annual company reports may not be based on measurement-informed inventories, and reporting frameworks do not consistently require them, creating a risk of underestimation. In 2025, only 16% of oil and gas production was being reported at OGMP 2.0 Level 5 (Figure 1.8) – the most rigorous reporting level – although this share is expected to increase to 27% by 2027.

Figure 1.8 OGMP 2.0 coverage of oil and gas production in 2025 and in 2030



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Sources: IEA analysis based on data from UNEP's International Methane Emissions Observatory based on current membership and implementation plans. More information on OGMP 2.0's five reporting levels can be found in Table 3.1 in Chapter 3 below, as well as in OGMP 2.0's Reporting Framework.

Reporting frameworks also do not systematically require independent third-party verification, potentially undermining trust in reported emissions. Concerns have also been raised about the integrity and transparency of certain certification schemes, further affecting the credibility of emissions reported under them. Such reliability issues can erode buyers' trust in reported emissions and reduce their willingness to seek fuels branded as "low-intensity".

While improving reliability can support the emergence of a near-zero marketplace, it is also important to recognise that quantification, measurement and verification

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can entail costs and practical challenges for producers. Measurement campaigns and third-party verification can be particularly demanding for remote, offshore or geographically dispersed operations. Access to qualified service providers (e.g. data providers or verification bodies) varies across jurisdictions and may be limited in certain economies.

Developing a global near-zero methane marketplace requires balancing the need for robust, reliable emissions data with practical considerations of feasibility and broad participation. A framework that accounts for regional circumstances and differences in producers' technical capacities can facilitate market entry while providing a credible pathway to progressively lower emissions. Existing industry practices – including OGMP 2.0 Level 5 reporting, satellite-based assurance processes and third-party verification of company-level data – offer a useful starting point. Building on these practices over time can help establish a robust, credible framework that gives buyers confidence in reported emissions.

Incentives

For a marketplace to function well, buyers also need to have an incentive to participate and select fuels according to emissions performance. Some buyers already have incentives to procure near-zero fuels, including importers in the European Union seeking to comply with the EU Methane Regulation and AI firms responding to reputational considerations. Many others, however, have no direct financial, regulatory or reputational incentive to participate in a marketplace. Appropriate incentive mechanisms will be crucial to encourage buyers to take part and demand verified near-zero oil and gas.

Incentives are equally important for producers. Even where abatement is technically feasible, producers may face upfront capital costs, delays in monetising captured gas, infrastructure constraints and recurring monitoring and verification costs. They need a credible commercial rationale for shouldering the costs associated with emissions abatement, measurement, reporting, and verification. This requires clear and durable demand signals, as well as commercial arrangements that allow producers to capture the value of improved methane performance. Effective incentives must therefore encourage buyer participation while enabling producers to recover their investments and ensuring that value is allocated across the supply chain.

Traceability

Oil and gas supply chains are characterised by complex networks, extensive commingling and long-distance transportation. Crude oil is commonly aggregated into export grades and may be blended during transportation and marketing. Pipeline gas moves through shared networks in which gas from multiple sources

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is commingled, and commodity ownership, transportation capacity and storage rights are typically handled separately. For LNG, feed gas from multiple projects may be aggregated prior to or during liquefaction, while LNG cargoes may be supplied to multiple buyers. More information on modern oil and gas supply chains – including physical supply chains, commercial arrangement and pricing structure – can be found in Annex 2 (Understanding oil and gas markets).

These realities mean that volumes of oil or gas may be traded commercially without necessarily moving physically or undergoing any change in composition. It also means that the physical connection between an individual producing asset and a delivered product may be weakened as oil or gas moves through supply chains. Emissions performance may not always remain identifiable in the oil or gas ultimately delivered to the buyer. As a result, a producer may be able to quantify and verify performance at an upstream asset, but may not be able to associate that performance directly with a particular cargo or delivery.

Oil and gas supply chains also differ in their commercial arrangements and market practices. Natural gas and LNG trade is often underpinned by long-term contractual arrangements, whereas crude oil markets typically involve greater use of trading, aggregation and cargo redirection. Crude oil procurement is influenced by crude quality and export grade, as well as refinery configuration and desired product yields. Consequently, different crude grades are not necessarily fully interchangeable within refinery operations.

Building the NZIMM will require establishing mechanisms that link verified upstream emissions performance to marketed volumes and that allow upstream producers to reap the benefits of investment in methane abatement technologies. It will also require the development of mechanisms that reflect existing commercial arrangements, market practices and infrastructure constraints. The European Commission's July 2026 recommendation on compliance solutions for the European Union Methane Regulation can inform work on these issues.

At this stage, however, the IEA's report focuses on developing a credible common framework for assessing upstream performance. Questions on how this performance can be associated with purchased volumes and integrated into commercial transactions will be considered at a later stage, once the framework has been developed and agreed. Addressing questions related to linking and commercial transactions will require defining how market participants transact, retire and claim volumes marketed as low-intensity. This, in turn, will require detailed rules regarding attribution, accounting, chain-of-custody, transfer and retirement. It will also require safeguards against double-counting and misleading claims. Different models exist for trading performance attributes. Some directly associate performance with marketed volumes (e.g. by integrating performance

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into long-term contracts) while others separate emissions attributes from physical supply through tradeable certificates that represent a standardised fungible unit of the attribute (e.g. a "book-and-claim" system).

IEA's proposed framework for the near-zero intensity methane marketplace

A well-functioning global marketplace requires producers, buyers and governments to agree on common standards, definitions and methodologies for trading oil and gas on the basis of methane performance. This report aims to support this process by establishing a shared understanding of the rules, standards and processes needed to underpin such trade. With it, the IEA aims to facilitate better understanding, lower barriers to participation and help lay the foundations for a well-functioning global market over time.

The report proposes a framework for defining and demonstrating upstream methane performance, based on the principles of transparency, comparability and reliability. These principles reflect feedback received by the IEA during consultations held in July 2026. To avoid duplication and facilitate implementation of the NZIMM, the proposed framework builds on existing methane-related transparency and accounting initiatives, including UNEP's OGMP 2.0, Methane Intelligence Quotient (MiQ), the Natural Gas Sustainability Initiative (NGSI), ONE Future, and the International Working Group to Establish a Greenhouse Gas Supply Chain Emissions Measurement, Monitoring, Reporting and Verification Framework (MMRV Working Group).

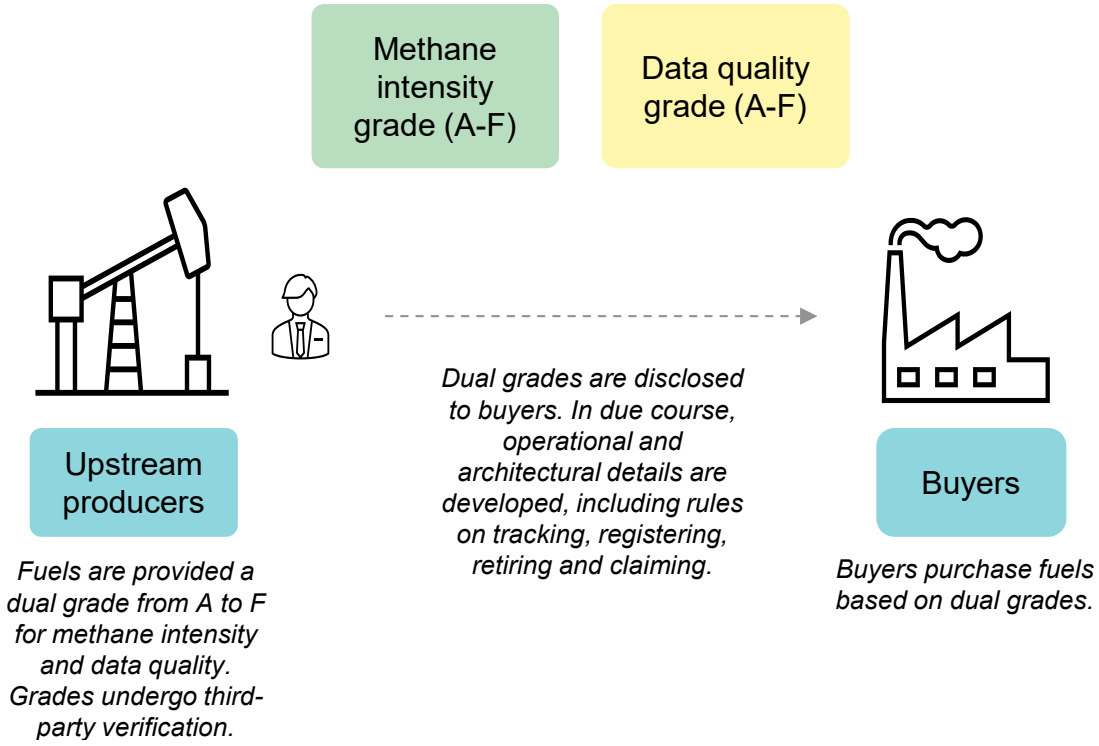
Participation in the NZIMM is intended to be entirely voluntary. Commodity markets already offer precedents for voluntarily differentiating products by quality and reflecting these differences in price premiums, both outside the energy sector (e.g. ash in grain and silica content in iron ore) and within it (e.g. sulphur content in crude oil and emerging methane-focused certification schemes). Government support could nevertheless help accelerate marketplace development and encourage participation by both sellers and buyers, strengthening its potential to drive methane emissions reductions. The report therefore identifies policies that governments could use to encourage participation. The proposed framework is also designed to be interoperable with existing methane-related regulations, including the European Union's Methane Regulation. Whether to adopt policies in support of the marketplace remains entirely at the discretion of individual governments, in line with their national priorities and circumstances.

This report focuses on the fundamental questions of how to define near-zero methane oil and gas and how to demonstrate and compare performance across assets. The related question of how verified performance can be linked to marketed volumes and incorporated into commercial transactions is left for a subsequent phase of work. The development of a functioning NZIMM will require

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further consideration of several operational and architectural questions. These include governance arrangements (including responsibility for maintaining and updating the framework and overseeing verifiers); technical infrastructure (including the platforms and registries needed to disclose and purchase verified oil and gas); trading mechanisms (including available models for exchanging and tracking low-intensity oil and gas, and potential model clauses for oil and gas contracts); record-keeping (including how to trace the origin and attributes of specific volumes and record their retirement); and claims (including the claims buyers can make and the circumstances in which purchases of verified gas can support Scope 3 emissions reporting).

Figure 1.9 Proposed framework for the NZIMM



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Notes: The diagram is intended to provide a conceptual illustration of the proposed framework's objectives. It should not be interpreted as a representation of how oil and gas markets currently operate. In practice, oil and gas may change hands multiple times along the supply chain before reaching the final consumer. Making the marketplace operational will require detailed rules and arrangements for attributing emissions performance, taking into account existing commercial structures and practices.

The proposed framework is based on assessing two complementary indicators at the asset level: methane intensity and data quality (Figure 1.9). Each asset receives a letter grade from A to F for each indicator, producing a two-letter rating (e.g., AA, CB or BF).[5]

[5] This aligns with MiQ's certification scheme, which uses an A-to-F grading scale to score producers across methane intensity, company practices and monitoring deployment.

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The methane-intensity grade is calculated using a standard formula with a common numerator, denominator and scope. Producers apply this formula to their assets to determine their methane intensity and corresponding grade. Intensity below a certain threshold is recognised as “near-zero”, establishing a shared understanding of what qualifies as near-zero performance.

The data-quality grade reflects the reliability of reported emissions, based on the robustness of the methodology used to calculate the producer's reported intensity. Measurement-informed inventories receive higher scores than ones based exclusively on emission factors. Independent third-party verification is required, giving buyers confidence in the reported data.

The methane-intensity and data-quality grades are always to be disclosed together, giving buyers a clear indication of how much confidence they can place in sellers’ reported intensity. This approach aims to incentivise producers to not only reduce methane intensity at their assets, but to also improve emissions quantification.

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Chapter 2. Defining a methane intensity metric

Building a global near-zero intensity methane marketplace (NZIMM) requires buyers to understand the methane intensity of the oil and gas they purchase – that is, the amount of methane emitted during its production. They must also be able to compare the intensity of different supply sources on a like-for-like basis, enabling them to choose fuel sources with lower methane intensity.

This chapter proposes a standardised formula for calculating methane intensity that allows comparisons between supply sources while remaining simple for producers and buyers to use. The proposed intensity is calculated as the energy content of methane emissions from oil and gas production activities divided by the total marketed oil and gas energy from the asset. Both the numerator and the denominator are measured on a high heating value (HHV) basis. Expressing both emissions and production on a consistent energy basis allows methane intensity to be reported as a percentage, representing the share of energy lost to the atmosphere as methane during oil and gas production.

This chapter outlines the rationale underpinning the IEA's recommended methane intensity formula. It also proposes a definition of "near-zero" methane intensity and a grading scheme to classify fuel sources according to their emissions intensity. These recommendations are intended to provide a basis for a common framework; additional technical details will need to be refined as the NZIMM framework evolves in 2027 and beyond.

The need for a common intensity formula

There is currently no harmonised formula for calculating and reporting methane intensity. Instead, a range of approaches coexist, using different numerators, denominators and boundaries (Table 2.1). This fragmentation makes it difficult for buyers to compare fuel sources on the basis of emissions performance, hindering the development of a global methane marketplace. A common definition of methane intensity is therefore essential for benchmarking performance, enabling meaningful comparisons and supporting the emergence of a global methane marketplace.

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Table 2.1 Overview of existing methane intensity formulas for oil and gas

Organisation	Segments covered	Numerator	Denominator
OGCI	Upstream oil and gas (wellhead to point of sale)	Total volume of methane emissions from oil and gas production for all OGCI companies	Total volume of natural gas marketed by OGCI companies
MiQ	Full natural gas value chain	Mass of methane emissions (tonnes)	Methane content in production throughput
	Upstream liquid petroleum operations	Mass of methane emissions (grams)	Total energy throughput (barrels of oil equivalent)
ONE Future	Full natural gas value chain, broken down into five segments	Mass of methane emissions (tonnes)	Gross production or throughput volume (million cubic feet)
EPA (Waste Emissions Charge)	Facilities that send natural gas for sale (production, gathering and boosting, LNG storage, loading and unloading, natural transmission, underground storage)	Mass of methane emissions (tonnes)	Natural gas sent for sale from or through facility
	Facilities that send no natural gas for sale (onshore and offshore petroleum, natural gas production)	Mass of methane emissions (tonnes)	Oil sent for sale from facility
RMI	Full value chain emissions	Mass of methane emissions (kilograms)	Total oil and gas production (barrels of oil equivalent)
NGSI	Full natural gas value chain, broken down into five segments	Mass of methane emissions allocated to gas production or throughput	Mass of methane in natural gas throughput
Cheniere Energy	LNG value chain (from wellhead to point of delivery)	Total methane emissions (in tonnes)	Tonnes of LNG loaded (free on board), or tonnes of LNG delivered at regasification (delivered at place)

Notes: OGCI = Oil and Gas Climate Initiative; MiQ = Methane Intelligence Quotient; ONE Future = Our Nation's Energy Future Coalition (United States); EPA = US Environmental Protection Agency; EDF = Environmental Defense Fund; NGSI = Natural Gas Sustainability Initiative; RMI = Rocky Mountain Institute. Implementation of the Waste Emissions Charge has been delayed until 2034. The OGCI formula is also used by the Oil and Gas Decarbonization Charter (OGDC) for setting its "near-zero" target of 0.2% by 2030.

Sources: IEA analysis based on data from OGCI; MiQ; One Future; Waste Emissions Charge; NGSI; RMI; Cheniere Energy.

An intensity-based metric can allow operators to claim a reduction in intensity simply due to an increase in output, even when their absolute emissions have not fallen. Nevertheless, an effective marketplace requires that performance be comparable across operators and assets. An intensity-based approach enables more meaningful comparison between assets, as it accounts for the fact that assets have varying production levels and that some assets will naturally have higher emissions due to higher production volumes. An asset with higher absolute emissions but proportionally higher production volumes demonstrates better

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emissions performance than a lower-emitting asset, and this distinction should be recognised in scoring the performance of assets. Intensity-based grading is also less susceptible to changes in asset composition, as it prevents operators from claiming a reduction in absolute emissions that results simply from divestment or decommissioning. At the same time, because production activities and asset configuration vary across projects, various elements must be defined to ensure that any intensity-based grading methodology is suitable for comparison purposes.

Setting the boundaries

A common definition of methane intensity starts with consistent system boundaries. To assess and compare fuel sources, buyers need emissions to be calculated and reported on the same basis. Inconsistent boundaries can put certain operators at a competitive disadvantage if their reported intensity captures a broader range of emissions than that of their peers. Boundaries must therefore be consistent in both geographic scope and time period.

Geographic boundaries

Which oil and gas supply chain segments should the NZIMM cover?

Methane emissions occur at multiple points along the oil and gas value chain, from pre-production to delivery. According to IEA analysis, around 80% of oil and gas methane emissions arise in the upstream sector, which covers production, gathering and processing – both onshore and offshore (Figure 2.1). The remaining 20% comes from downstream operations, primarily gas transport, including leaks from transmission and distribution pipelines, as well as emissions from liquefied natural gas (LNG) shipping, storage and regasification. Other downstream sources include storage facilities, refineries and oil transport.

Calculating a single emissions-intensity metric that covers both upstream and downstream components presents challenges. Gas supplies are often blended from multiple sources, while pipeline shipments may change ownership several times along the supply chain. Product losses can also occur during transport and handling, changing the volume of gas delivered and, in turn, the denominator used to calculate emissions intensity.

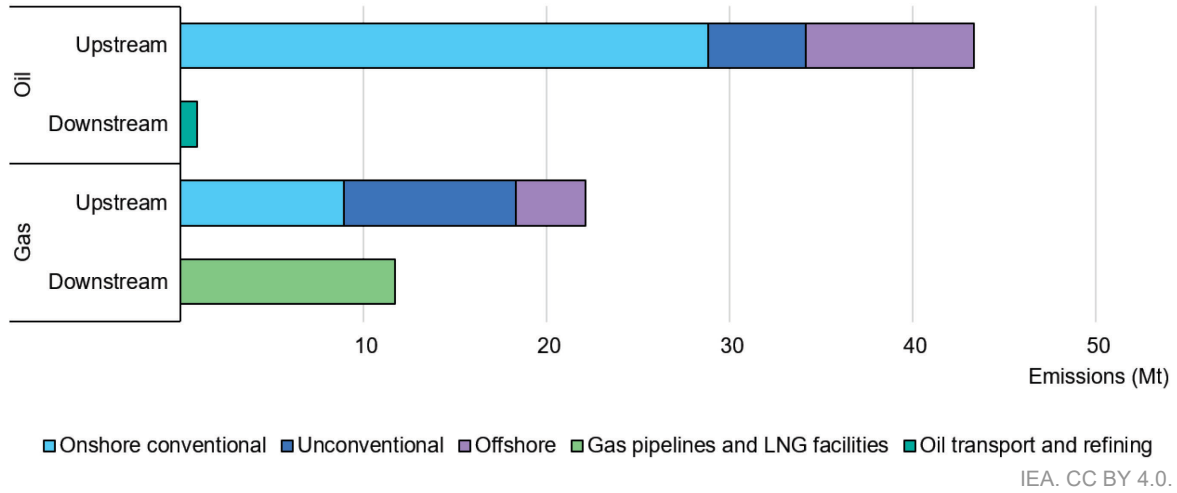
To give end users a comprehensive picture of the lifecycle methane intensity of delivered products, the NZIMM could eventually be extended to cover the entire oil and gas value chain. Initially, however, NZIMM implementation would be made more effective by focusing on the upstream sector, which accounts for the largest

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share of emissions and offers the greatest potential for cost-effective reductions (although the sector's relative contribution to total emissions may vary across countries and discrete supply chains).

The IEA's proposed NZIMM framework therefore focuses on assessing the emissions performance of upstream activities first, using a clearly defined upstream intensity metric. As the viability of the upstream framework is established and data reporting and traceability improve across the downstream sector, the framework can be progressively expanded to encompass additional segments of the value chain, providing a full accounting of emissions across the supply chain – all the way through to distribution. Such expansion would need to consider the distinct facility configurations and operating characteristics of downstream segments and be contingent on demonstrating the viability of the framework in the upstream sector.

Figure 2.1 Methane emissions from oil and gas operations, 2025



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Notes: Mt = million tonnes; LNG = liquefied natural gas. Excludes emissions from LNG shipping.

Which activities should be included within the "upstream" segment?

At present, there is no agreed definition of "upstream", and the activities covered by the term vary. After extraction from the well, oil and gas typically pass through gathering systems, which collect and consolidate production from multiple wells. Pumps and compressors may be used at various points to increase pressure and facilitate the flow of hydrocarbons. The resulting fluids are then processed to separate oil, gas and water and to remove or reduce unwanted components, such as water, carbon dioxide (CO_2) and other impurities. Where applicable, natural gas liquids are also separated from the gas.

The configuration of upstream operations varies across assets. Some extraction sites have gathering, compression and processing equipment, while others

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contain only production infrastructure, such as wellheads. Gathering, compression and processing facilities may be owned or operated by entities other than the producer, or may be shared by multiple producers. Their use may also vary seasonally, with producers switching between facilities over the course of a year.

Operators currently include different operational activities when calculating upstream methane intensity. Although production activities are generally included, gathering, compression and processing are not always covered. Devon Energy in the United States, for example, includes gathering and boosting in its upstream intensity calculation, whereas EQT Corporation classifies the associated emissions as "midstream".[1] The Oil and Gas Climate Initiative (OGCI), meanwhile, defines upstream as all operations from wellhead to the first point of sale, including gas liquefaction and production drilling but excluding refining, shipping, transmission, distribution, and exploration drilling.

The activities included in the calculation can affect reported intensity and undermine comparability across operators. For example, a production area that includes processing facilities will report higher emissions than a comparable area without them. Its reported emissions intensity may therefore be higher, not because it performs worse on emissions but because its operations cover a broader range of activities. As a result, the operator with integrated processing facilities would be placed at a disadvantage, while those without such facilities may appear to perform better simply because of how their operations are configured.

Such differences risk creating an uneven playing field and undermining the comparability of reported metrics. For buyers to make informed decisions, methane intensity metrics must provide a consistent basis for comparing fuel sources. This requires a standardised definition of the operational activities covered. A key design consideration for the NZIMM is therefore whether to limit its scope to production or extend it to include gathering, compression and processing.

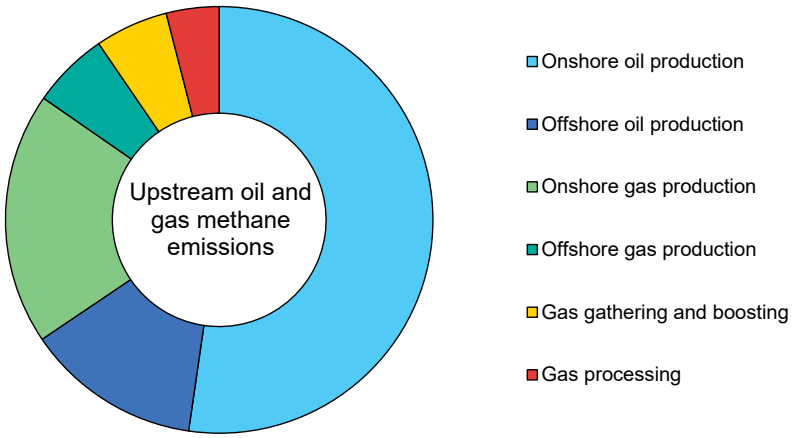
Gathering, compression and processing account for an important share of total upstream oil and gas emissions (see Figure 2.2). Including these activities in a single methane intensity metric, however, presents practical and methodological challenges. Such facilities are often operated by third parties or shared among multiple producers. Calculating a combined intensity would therefore require producers to obtain emissions data from other companies and allocate emissions to their own production on a proportional basis. This could prove difficult in practice, particularly if third-party operators are unwilling to share data or refuse to allow access to facilities for measurement campaigns.

[1] The term is included here to reflect the company's own terminology. The IEA does not use midstream as an analytical segment in its methane-related work.

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Default emission factors could be used to estimate emissions from gathering, compression and processing where facility-level data are unavailable. But this approach would introduce additional uncertainty, potentially reducing the accuracy and reliability of reported intensity metrics. More fundamentally, including these activities in a single metric would make producers accountable for emissions over which they may have limited operational control and little ability to secure reductions.

Figure 2.2 Global distribution of upstream oil and gas methane emissions, 2025



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Note: Does not include emissions associated with oil transportation, oil refining, LNG storage, LNG import terminals and gas transmission and distribution.

A balance is needed between practicality, comparability and emissions mitigation. As a first step, the IEA recommends limiting methane intensity calculations to production activities only. This would make it easier to compare operators and assets while avoiding the practical difficulties of obtaining and allocating emissions data from third-party operators. It would also align with the import standards set under the European Union Methane Regulation, which require importers to report intensity "at the producer level" and to include gathering, compression and processing only where these activities take place within the licensed area.

Over time, the NZIMM could be extended to cover more of the value chain. One option would be to establish separate intensity metrics and grading schemes for production, gathering and compression, and processing. This would provide greater visibility into emissions performance across individual segments while preserving comparability within each. Alternatively, the NZIMM could introduce a combined intensity score covering all these activities. This could encourage producers to work with third-party operators to reduce emissions, including through contractual arrangements that incentivise or require abatement.

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Box 2.1 Addressing emissions from pre-production and legacy activities

Upstream methane emissions do not occur exclusively during production activities. Methane emissions can also occur both before and after production.

Pre-production emissions can arise from exploration drilling, well completion and field development. Reducing emissions from these activities is essential to cutting global methane emissions, but incorporating them into a methane intensity metric presents practical challenges. Because they occur before production begins, attributing them to produced output is inherently difficult. Their inclusion could also weaken the link between reported intensity and marketed volumes, while putting operators investing in new projects at a disadvantage relative to those focused on maintaining existing production. Future NZIMM work will need to consider whether and how to incorporate these emissions within its framework. Should a decision be taken to include these emissions, one option would be to include them in an operator's reported inventory during the first year of production or upon initial participation in the NZIMM. Appropriate safeguards would be needed, however, to ensure that operators do not delay participation in the NZIMM to avoid reporting these emissions.

Post-production emissions occur when a well is abandoned and improperly decommissioned. According to IEA analysis, there are around 8 million abandoned onshore oil and gas wells globally, at least 4 million of which are located in the United States. While not all abandoned wells are significant sources of emissions, wells that are not properly plugged can continue to emit methane for many years. The IEA estimates that abandoned wells are responsible for around 3.5 Mt in emissions, 40% of which come from the United States. However, as with pre-production emissions, incorporating post-production emissions into a methane intensity metric presents methodological challenges. As these emissions occur after production has ceased, attributing them to produced volumes within an intensity calculation is difficult and may undermine comparability across producers. Estimating emissions from these wells may be challenging, particularly where no entity has clear responsibility for their monitoring and reporting. In many cases, no identifiable operator may exist, leaving no corresponding production denominator. Addressing emissions from abandoned wells also requires addressing complex questions regarding well transfer and ownership. Legacy emissions are therefore excluded from the NZIMM's current scope and will be considered at a later stage. Should a decision be taken to include these emissions at a future stage, one option would be to estimate emissions from abandoned wells at the basin level and apportion them among operators active in the basin, creating a collective incentive to plug abandoned wells.

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How should emissions performance be aggregated in the NZIMM?

Methane intensity can be calculated and reported at different levels of granularity including, for example at the company, basin, field, or asset level (Table 2.2). Developing a framework for the NZIMM requires choosing the level of aggregation and granularity that is best suited to promoting trade in near-zero oil and gas and maximising emission reductions, while ensuring practicality for operators.

Table 2.2 Aggregation levels for calculation of methane intensity

Granularity level	Definition	Example
Country	Sovereign state with its own government, laws and borders	Australia
Company	Legal entity established to conduct commercial oil and gas activities, acting as an operator or partner in projects	Chevron Corporation
Basin	Large geological feature in the Earth's crust in which sediments have accumulated over extended periods of time, creating the conditions for hydrocarbon generation	Carnarvon Basin
Field	Specific area within a basin where crude oil or natural gas has naturally accumulated in one or more reservoirs (potentially linked to one another) and is trapped by impermeable rock formations	Greater Gorgon Field
Asset	Single coherent business or operating unit falling under common management, which can include multiple fields	Chevron's Gorgon LNG Project
Facility	Physical installation located on a single site designed to perform specific technical functions for the exploration or production of hydrocarbons	Well sites; offshore production platforms
Source	Specific component within a process or equipment that releases methane emissions into the atmosphere, either intentionally or unintentionally	Flaring system; pneumatic controller

Note: The term "facility" has a specific meaning under the U.S. Greenhouse Gas Reporting Program, and the definition proposed here may differ from the definition used in that regulatory framework.

Company or country aggregation

At one end of the spectrum, an operator's emissions can be aggregated across all of a company's assets worldwide, including those located in different countries or basins, or across its assets within a single country. Many companies already calculate a single intensity metric for all their operated assets and disclose it in their annual sustainability reports.

Company- or country-level aggregation can provide a useful overview of operational performance across a producer's global portfolio or within a specific country, informing investment decisions and reputational assessments. It can also

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help encourage systematic methane abatement across a company's full portfolio of operated assets. However, such broad measures can mask significant differences in intensity between assets and countries. A methane marketplace could be made more effective if buyers could assess performance at the regional or asset level, creating incentives for operators to address emissions from poorer-performing assets or regions. For these reasons, aggregation at the company or country level is not recommended for the NZIMM.

Facility or source aggregation

At the other end of the spectrum, methane intensity can be assessed at the facility or source level. Although quantifying emissions at this level is essential for calculating overall methane intensity, reporting intensity for individual facilities or sources risks being overly granular and may not give buyers a complete picture of the methane intensity of their supply (though this limitation may be less significant when a single facility represents a company's entire asset, as with offshore production platforms). A comprehensive and accurate assessment requires emissions to be aggregated across all relevant components of the production system. In addition, production data may not be consistently metered at individual facilities or sites, complicating intensity calculations. For these reasons, aggregation at the facility or source level is not recommended for the NZIMM.

Basin, field or asset aggregation

Aggregation at the basin, field or asset level provides a useful overview of emissions performance without obscuring regional differences. It can encourage producers to improve methane performance across their operations, rather than allowing better results in some areas to offset poorer performance in others. It can also enable buyers to prioritise supplies from basins, fields or assets with lower methane intensity, creating incentives for producers to reduce emissions in other poorer-performing basins, fields or assets.

The appropriate level of aggregation – asset, field or basin – depends on the objectives. Using defined geological boundaries, such as field or basin, can improve comparability between fuel sources by ensuring that emissions intensities are calculated over consistent geographic areas. Basin-level aggregation can also encourage operators to tackle emissions across the basin. Otherwise, they might focus their efforts on selected assets to meet demand for near-zero oil and gas, while leaving higher-emitting assets unaddressed. This approach could reduce the risk of operators cherry-picking their best assets at the expense of broader emissions reductions.

Geological boundaries, however, do not always reflect operational realities. A single field may span multiple licensed production areas, and field-level reporting boundaries may not align with how production is organised. Field-level reporting

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may also be impractical for unconventional producers, particularly in North America, where hydrocarbons are often extracted across multiple locations rather than from a single, clearly defined field. Basin-level reporting may be slightly more practical for operators, but it can complicate the calculation of data quality scores (see Chapter 3) if emissions quantification practices vary within the same basin.

Feedback received by the IEA throughout Q2 and Q3 of 2026 indicated a preference for asset-level aggregation. Although this approach may reduce comparability by allowing more flexibility in defining reporting boundaries (see Box 2.2), it allows operators to align reporting boundaries with how production activities are organised and structured. Moreover, it still enables differentiation between production assets and allows buyers to assess the methane intensity of specific supply sources. Requiring the same set of operational activities to be included within the metric, irrespective of how the asset is defined, can help address comparability concerns. Asset-level reporting also ensures consistency with existing frameworks, such as the Oil and Gas Methane Partnership (OGMP) 2.0, and forthcoming regulatory requirements such as the import standards of the European Union Methane Regulation.

The IEA therefore recommends aggregating methane intensity at the asset level. Asset-level aggregation strikes an appropriate balance between representativeness and practicality. It avoids the challenges associated with a geological approach while providing a decision-useful snapshot of performance for an operationally meaningful unit. To ensure a minimum degree of consistency across operators, however, the definition of an asset should be subject to an upper limit, with assets generally covering no more than a single basin or a country, whichever is smaller. Clear disclosure of the geographic boundaries used to define each asset would also help improve transparency and comparability in reporting.

Box 2.2 Defining oil and gas assets

In the oil and gas sector, the term “asset” is often used when discussing upstream production or methane emissions quantification. The Oil and Gas Methane Partnership (OGMP) 2.0 Reporting Framework, for example, specifies that participating companies must report emissions at asset level (both for operated and non-operated assets), which is defined as “a logical business or operating unit”. The European Union Methane Regulation similarly requires operators to report source-level methane emissions for operated and non-operated assets, with the term “asset” defined as “a business or operating unit, which can be composed of several facilities or sites”. MiQ, uses the term “facility” in its methane

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performance standards, with 37 facilities currently holding certification and listed in the MiQ registry.

The term “asset” is, however, subject to different interpretations. Companies typically define asset boundaries based on operational, legal, commercial and accounting considerations. As a result, the term “asset” lacks a standardised meaning and may encompass a range of facilities and sites. For example, one company participating in OGMP 2.0 may treat multiple offshore concession blocks as separate assets, while another may combine these blocks into a single production area (e.g. “North Sea Offshore”). Asset boundaries may also be shaped by joint-venture arrangements, operatorship, licence areas and shared facilities. OGMP 2.0 imposes only two conditions on the level of aggregation: first, an asset must be defined so that all facilities or sites operated by the reporting unit participate in the programme; and second, an asset defined by geographical boundaries should typically cover less area than an entire country.

The term “asset” involves a trade-off between flexibility and comparability. Although it is not standardised, it allows producers to tailor reporting boundaries to their operations. Defining the appropriate approach for the NZIMM requires striking a similar balance: allowing flexibility while ensuring sufficient standardisation for consistent and comparable reporting.

Which emissions should be included within the scope of the methane intensity metric?

To ensure that the intensity metric accurately reflects methane performance, it must cover all direct methane emissions from production activities within the asset’s boundaries, whether intentional (flaring and venting) or unintentional (leaks). This includes emissions from all core facilities, sites or equipment, examples of which are listed in Table 2.3. Future work on the NZIMM could establish common definitions for these facilities, sites and equipment to improve consistency across companies, countries and assets.

A guiding principle is that operators not omit individual facilities, sites or equipment from the scope of an asset’s methane intensity metric. Operators may choose not to have an entire asset graded under the voluntary NZIMM, but if they opt in, all direct sources of emissions would need to be included. This would prevent operators from selectively including lower-intensity facilities or sites, ensuring a more accurate picture of overall emissions performance.

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Table 2.3 Core facilities, sites and equipment for onshore and offshore upstream oil and gas

Onshore	Offshore
Well sites	Fixed and floating production platforms
Centralised production facilities	Floating production storage and offloading units
Gas lift and injection systems	Gas lift and injection systems
Produced water treatment units	Produced water treatment units
Storage tanks, flare systems and vapour recovery units	Storage tanks, flare systems and vapour recovery units
Temporary drilling, completion or maintenance activities	Temporary drilling, completion or maintenance activities

Sources: IEA analysis based on data from University of Texas Energy Emissions Modelling and Data Lab's Verification and Reporting Protocol for European Union Methane Regulation Compliance.

Temporal boundaries

To enable buyers to compare the emissions performance of different fuel sources, intensity must be calculated and reported over a common timeframe. Producers therefore need to use consistent temporal boundaries for calculating and reporting intensities.

The IEA recommends calculating and reporting intensities annually, covering the most recent complete calendar or fiscal year. An annual timeframe strikes an appropriate balance between reporting frequency and administrative burden. It also aligns with existing company practices, including annual sustainability reporting, national regulatory requirements (such as Canada's Greenhouse Gas Reporting Program), and voluntary methane initiatives (such as OGMP 2.0).

Methane intensities would be calculated retrospectively, allowing operators to demonstrate asset-level performance for the subsequent calendar or fiscal year until an updated intensity is calculated using new annual data. Specific provisions would be needed for assets divested or decommissioned during the year. Options could include limiting the operator's claimed intensity to the share of volumes marketed during the period of ownership or operation, or requiring reporting for the full calendar or fiscal year despite the divestment or decommissioning.

Determining the appropriate intensity formula

The IEA recommends expressing methane intensity on an energy basis, calculated as the energy content of methane emitted from oil and gas production activities at an asset divided by the total energy content of marketed oil and gas

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from that asset, as per the formula below.[2] Both the numerator and the denominator are measured on a high heating value (HHV) basis. The following section sets out the rationale for this recommendation, including the choice of an energy basis, the use of total oil and gas output as the denominator and the definition of output as marketed production.

$$\text{Intensity (\%)} = \frac{\text{Energy in methane emitted from oil and gas production (HHV)}}{\text{Total marketed oil and gas energy (HHV)}}$$

Why should intensity be expressed on an energy basis?

The ratio of emissions to output can be expressed in mass, volume or energy units, as compared in Table 2.4.

Table 2.4 Bases for calculating methane intensity

Basis	Explanation	Unit examples
Mass	Amount of methane emitted relative to the quantity of matter in produced hydrocarbons	Kilograms; tonnes; tonnes of oil equivalent
Volume	Amount of methane emitted relative to the physical space occupied by produced hydrocarbons	Cubic metres; cubic feet; thousand barrels of oil
Energy	Amount of methane emitted relative to the energy contained in produced hydrocarbons	Gigajoule; million British thermal units; barrels of oil equivalent

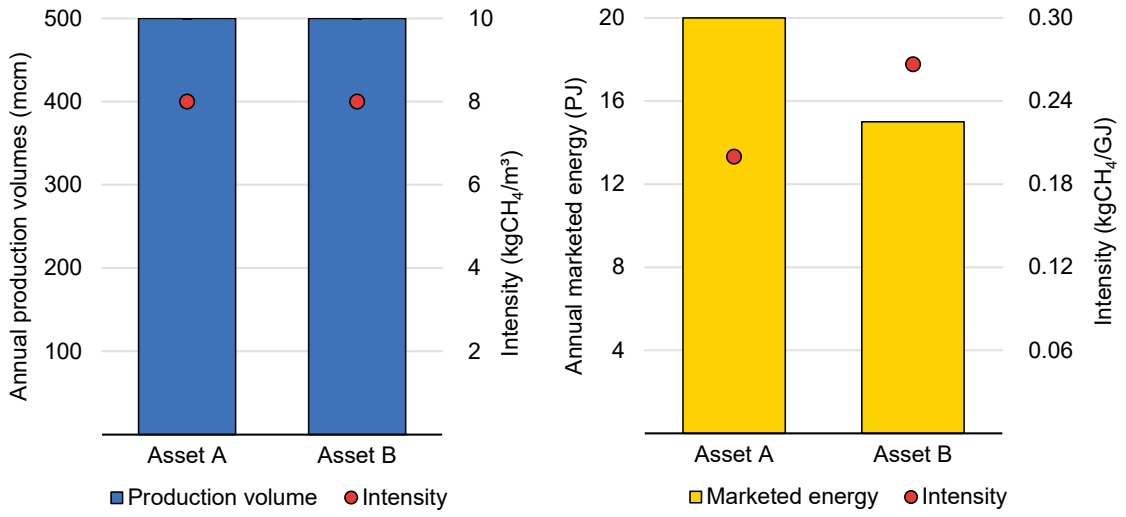
A volumetric or mass basis presents several challenges. Natural gas output is generally not reported in mass terms and is instead reported in volumetric terms. Crude oil output is reported in both mass and volumetric terms but using different volumetric units than for natural gas output. Measuring methane intensity by volume or mass could therefore hinder meaningful comparisons between oil-focused and gas-focused assets. Although gas volumes can be converted into mass to facilitate comparison with oil, this requires data or assumptions about gas density, type, composition, pressure and temperature, adding complexity to the calculation.

[2] This is aligned to the "Methane Energy Intensity" metric as described in Johnson et al. (2026). Note that where intensity values are provided in this report, marketed oil and gas has been converted from a LHV to an HHV basis using approximate factors: 0.95 for liquid fuels and 0.9 for gas.

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Identical volumes of crude oil or natural gas can also contain very different amounts of energy, depending on their composition and heating value. These variations arise from differences in hydrocarbon characteristics across fields. For example, natural gas with a higher proportion of heavier hydrocarbons, such as ethane and propane, generally has a higher energy content per unit of volume than gas composed predominantly of methane. Two assets producing identical volumes of the same hydrocarbon can therefore have different energy intensities – differences that a volume-based intensity metric would obscure (Figure 2.3).

Figure 2.3 Illustrative comparison of upstream methane intensity for two assets with similar gas production volumes but different calorific values



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Notes: Example assumes that the annual production volume for each asset is 500 million cubic meters (mcm), and that each asset emits 4 000 metric tonnes of CH_4 per year. Asset A is assumed to market natural gas with high calorific value (with an energy density of 40 MJ/m³) while Asset B markets natural gas with low calorific value (with an energy density of 30 MJ/m³).

Ultimately, oil and gas production is largely driven by the energy content of these resources: most hydrocarbons are extracted for their energy value, which also underpins their economic value in the market. Using an energy basis enables meaningful comparisons across the upstream oil and gas sector, including between assets producing the same volumes of hydrocarbons. It also facilitates comparisons with methane emissions from other energy sectors (e.g. coal or hydropower), which is important when considering the NZIMM's potential expansion beyond oil and gas.

Although energy-based metrics may be less intuitive to stakeholders outside the energy sector, they reflect the societal value of fossil fuel production and help illustrate the trade-offs between fossil fuel consumption and climate impacts. They also align with existing market practices, under which oil and gas are priced on an energy basis (e.g. Henry Hub, Japan Korea Marker).

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Why define the denominator as total oil and gas output?

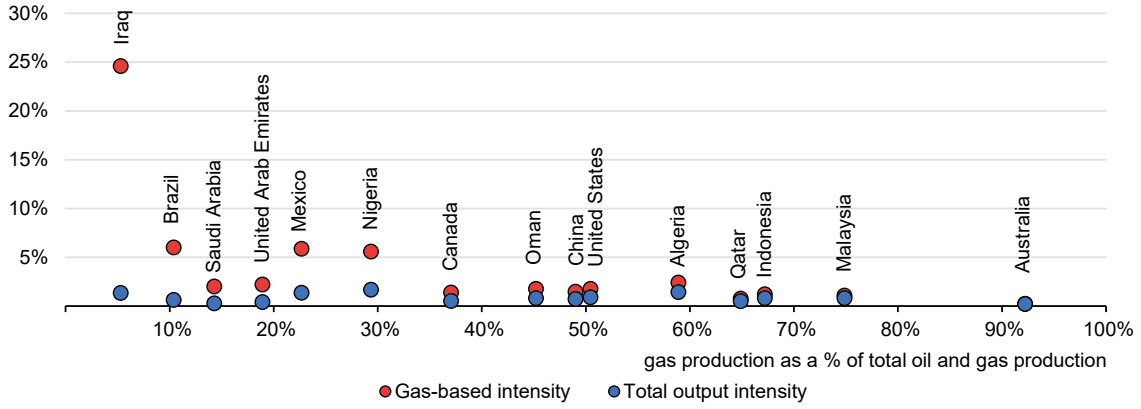
Defining a methane intensity metric also involves determining what output is used in the denominator. Different approaches can be used in this regard. One compares emissions with total oil and gas output, measured in energy terms; another compares them with marketed gas production. The latter is similar to the approach currently in use by organisations such as OGCI as well as some individual companies like BP and Aramco. By comparing emissions to gas output alone, this approach aims to show how effectively an operator prevents methane losses in its activities – that is, how much of delivered gas is lost to the atmosphere before reaching the point of sale.

A gas-based denominator presents methodological challenges, however. At a basic level, a gas-based intensity can become problematic if the NZIMM is to cover both oil and gas production. If a gas-based intensity is used, producers that only market oil would have a denominator of zero. Oil-only producers would, accordingly, have no intensity to report, and crude oil buyers would be left with no assessment of emissions performance for oil-focused assets. A separate formula would therefore be needed for oil-only producers, as was done under the US Waste Emissions Charge. This would add complexity and reduce comparability.

Even for assets that produce both oil and gas, a gas-based intensity creates methodological issues. Because the denominator includes only gas production, intensity increases as gas production approaches zero. This means that the intensity of different assets will vary not only according to the relationship between emissions and marketed output, but it will also fluctuate according to an asset's production mix. Although most oil and gas producers extract both products, the ratio of gas to oil can vary widely across operators, assets and regions. A gas-based formula will consequently tend to yield higher intensities for assets with little or no marketed gas production (e.g. oil-focused assets) and lower intensities for gas-focused assets. IEA analysis shows that economies with a high share of gas production (e.g. Australia) obtain broadly similar intensities regardless of the denominator used, while economies with a high share of oil production (e.g. Iraq) record substantially higher intensity when using a gas-based denominator (Figure 2.4).

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Figure 2.4 Upstream methane intensity of selected oil and gas producing economies using output denominator versus a gas-only denominator



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Notes: Gas-based intensity = energy content of methane emissions from oil and gas production activities divided by total energy content of marketed natural gas production. Total output intensity = energy content of methane emissions from oil and gas production activities divided by total energy content of marketed natural gas and oil production. All energy is reported on an HHV basis.

Source: IEA analysis based on data from IEA (2026), Global Methane Tracker 2026.

A gas-based denominator therefore distorts comparability (as intensity varies according to the gas-oil ratio rather than emissions performance purely) and disadvantages oil-focused operators, assets and regions. Two assets with the same emissions and the same amount of marketed energy, but different production mixes of oil and gas, will have different intensities. The natural advantage this creates for gas-dominant sites can be particularly problematic if intensity metrics are then used to establish thresholds or targets (including in national regulation), as compliance will prove easier for gas-focused assets compared to oil-focused assets.

A gas-based intensity can also give rise to other issues. Using gas as the denominator is counterintuitive for crude oil buyers seeking to understand the emissions performance of an oil-focused asset: in such cases, the resulting intensity does not relate to the product being purchased (oil) but instead reflects emissions relative to a different product (gas). Moreover, although comparing methane emissions with marketed gas is sometimes described as a “loss rate” (implying that it measures how effectively an operation manages gas relative to the volume ultimately sold), this formulation is not, strictly speaking, a true loss rate (Box 2.3).

The IEA accordingly recommends that methane intensity in the NZIMM be calculated by using total oil and gas output in the denominator.

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Box 2.3 Methane intensity and the concept of "loss rate"

The relationship between emitted methane and marketed whole gas is sometimes portrayed as a "methane loss rate" (i.e. the ratio of delivered gas that is lost to the atmosphere). In reality however, this approach does not provide a true loss rate.

While methane is the main component of natural gas, it only accounts for a portion of its total volume. Using whole gas as the denominator therefore compares two different metrics. Because whole-gas volumes exceed methane-only volumes, a whole-gas denominator will systematically yield a lower reported "loss rate" than a methane-based denominator, understating methane emissions relative to output. The methane share of whole gas can also vary widely across fields, ranging from 0.4 to 0.98. Using a whole-gas denominator fails to account for this variance, which can distort comparisons across fuel sources. While this is less likely to be problematic for gas with a high methane content, it can become more of a significant issue for low-methane gas. Thus, while using a whole-gas basis simplifies the calculation of intensity (as it does not require any information regarding gas composition), it reduces accuracy and comparability.

A true loss rate requires the use of consistent metrics. Methane emissions must be compared to methane in marketed gas, and emissions must be specifically attributed to gas production. Some organisations, including MiQ, Veritas and NGSI, employ a methane intensity that reflects a true loss rate (i.e. emitted methane from gas divided by methane in marketed gas). Normalising methane emissions by methane in marketed gas is preferable because it provides consistent loss rates across differing gas compositions.

However, a true loss rate can still present distinct problems for calculating production-level intensity. It is not applicable to assets that exclusively market oil (as there is no methane content in marketed oil). Further, while a true loss may be appropriate for segments that process, transport or distribute natural gas, it does not apply to the downstream oil sector (e.g. refineries), which does not market gas. This distinction is important when considering the potential expansion of the NZIMM to the downstream oil and gas sectors.

Why define output as marketed output?

Oil and gas output can be measured on a produced basis, reflecting the gross volume extracted, or a marketed basis, reflecting the volume brought to market for sale. Some organisations, such as NGSI, calculate intensity based on produced output, while the OGCI, TotalEnergies and others use marketed output.

Marketed production data tend to be more widely available globally, with many jurisdictions reporting only marketed output. Marketed-output data are also typically more reliable than produced-output data, since both producers and

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buyers have an economic incentive to ensure accurate measurement for contractual or tax purposes. Normalising emissions by marketed amounts can also incentivise producers to capture gas that would otherwise be wasted and bring it to market, as doing so will allow producers to increase marketed amounts within their denominator and thus lower their emissions intensity.

By contrast, unmarketed gas production is not directly measured at many sites and must instead be estimated (often imprecisely) using gas-oil-ratios or gas-in-solution values, particularly at heavy oil sites. In addition, gas extracted at some sites, particularly offshore, may be reinjected into the reservoir and later recovered, meaning the same gas can be counted as "produced" more than once. Taken together, these factors introduce uncertainty into reported production volumes, potentially distorting emissions intensity and undermining meaningful comparisons between assets. For the NZIMM, the IEA recommends using marketed output as the denominator for calculating methane intensity. Although this approach could, in principle, incentivise producers to limit gas reinjection or on-site use, appropriate adjustments to the methodology can address this potential distortion (see Box 2.4).

Box 2.4 Accounting for gas reinjection, use and storage

Gas that is captured at oil and gas production sites may not always be brought to market. Some operators use techniques to conserve the gas, for example by reinjecting it into the reservoir, using it on site for power and heat generation, or storing it on site. Some of these techniques generate emissions of other greenhouse gases, notably CO_2. Reducing fossil fuel consumption at oil and gas production sites is important for lowering the overall greenhouse gas (GHG) intensity of oil and gas supply chains. However, from a methane emissions perspective, gas conservation techniques do not have the same climate impact as flaring, venting and leaks, since methane is not directly released into the atmosphere.

Developing a methane intensity formula that uses marketed amounts as the denominator could potentially disadvantage operators who engage in these gas conservation techniques. Because reinjected, used or stored gas is not "marketed", its exclusion would increase these operators' denominator and thus increase their reported intensity, even when the gas is being managed responsibly.

Nonetheless, solutions exist to ensure that operators are not discouraged from adopting gas conservation techniques. One option is to include conserved gas in the denominator alongside marketed gas. However, this approach must account for potential variability in reinjected gas volumes and the possibility of the same gas

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being reinjected multiple times into producing wells, which could undermine the robustness of the methodology. Future NZIMM work should explore how the methane intensity methodology could be refined to avoid penalising gas conservation measures while preserving robustness and comparability across assets.

Product allocation and expansion to additional segments

For the reasons set out above, the IEA recommends combining oil and gas production into a single intensity metric. However, it is important to recognise that these two products often serve distinct end-uses and do not traditionally compete with each other. Buyers typically procure oil or natural gas separately rather than as a combined energy product.

In this regard, one advantage of the IEA's recommended intensity formula is that it can be readily adapted to calculate product-level intensities. Calculating product-level intensities requires allocating emissions between oil and natural gas production. Many emissions cannot easily be attributed exclusively to either product, while some emission sources, such as flaring or maintenance activities, are inherently associated with joint production. An energy-based intensity avoids this problem, as emissions can be allocated in proportion to the share of marketed energy attributable to oil or gas. For example, if oil accounts for 70% of an asset's total marketed energy output and natural gas for 30%, methane emissions can be allocated between the two products in the same proportions. Dividing the allocated emissions by the energy content of each product stream would yield separate methane intensities for oil and natural gas, allowing buyers to assess the intensity of the product they procure.

As the NZIMM is extended to additional segments of the value chain, separate intensity formulas for oil and natural gas production may become necessary. The two value chains diverge more prominently further downstream, with natural gas potentially undergoing additional methane-emitting activities, including gathering, processing and, where applicable, liquefaction at LNG facilities. Separate formulas could therefore provide a more appropriate basis for setting product-specific intensity targets that reflect the characteristics and emissions profiles of each value chain. With the NZIMM currently focused on upstream oil and gas production, however, a combined formula remains a simpler and more practical approach.

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Expressing intensity in units or on a percentage basis

The IEA's recommended formula uses consistent energy units (joules) in its numerator and denominator. A metric approach ensures consistency across a broad range of countries. Expressing both the numerator and denominator in the same units allows intensity to be reported as a percentage, representing the share of total energy that is lost to the atmosphere as methane.

Expressing methane intensity as a percentage has limitations. Many organisations already use percentage-based metrics to express methane intensity, but with a formula that uses a gas denominator – most notably the OGCI. The IEA's recommended formula, by contrast, uses a total oil and gas output basis (see above). Expressing the IEA's recommended formula on a percentage basis could therefore create confusion over the comparability and equivalence of these two approaches and be misinterpreted as a "methane loss rate". Expressing intensity in physical units, such as kilograms of methane (CH_4) per gigajoule (GJ) of marketed energy, would more clearly distinguish the two methodologies and facilitate the framework's extension to other emissions, including CO_2 emissions, for which an energy-based numerator would not be appropriate (because CO_2 has no chemical energy content).

Overall, however, the benefits of expressing methane intensity as a percentage outweigh these challenges. Both reporting methods (physical units and percentages) are equivalent if consistent conversion factors are used (Box 2.5). A percentage basis also provides an intuitive representation of emissions relative to marketed energy output, particularly for buyers and other stakeholders less familiar with methane emissions quantification and management. It may also facilitate communication and support the development of targets and benchmarks. However, if percentages are used, clear guidance is needed to distinguish targets based on different methodologies, including those using a gas-based denominator, from targets calculated using the IEA-recommended energy-based formula.

Box 2.5 Converting mass or volume units into energy

Methane emissions are generally reported on a mass basis (such as kilograms or tonnes) or volume basis (such as cubic metres). To express these emissions as a percentage of marketed energy, they must be converted into energy units using a consistent heating value (also referred to as calorific value), expressed as energy per unit of mass or volume (e.g. megajoules per kilogram, MJ/kg, or megajoules

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per cubic metre, MJ/m^3). The heating value represents the energy released through the complete combustion of a fuel under specified conditions.

Two heating values are commonly used for this conversion: higher heating value (HHV), also referred to as gross calorific value, and lower heating value (LHV), also referred to as net calorific value. HHV includes the latent heat recoverable from the condensation of water vapour produced during combustion, whereas LHV excludes this heat. For methane, HHV is approximately 55 MJ/kg, compared with approximately 50 MJ/kg for LHV. As a result, for a given mass or volume of methane, conversion using HHV yields an energy value approximately 10% higher than conversion using LHV.

Ultimately, however, the specific choice of a heating value is less important than ensuring consistency and transparency in its application. The selected heating value should be explicitly disclosed and applied consistently to both the numerator and denominator of the intensity formula. Using different calorific values across the formula's two components would distort the resulting percentage, and the use of different heating values across operators could undermine comparability between assets.

Current practices vary across jurisdictions and applications. LHV is commonly used in energy statistics and greenhouse gas inventory methodologies, including those of Eurostat and the Intergovernmental Panel on Climate Change (IPCC). By contrast, HHV is commonly used as the commercial energy basis for natural gas in North America (e.g., by Canadian utilities and the United States Energy Information Administration) as well as in European gas trading and transmission systems. It is also the required reporting unit by the Ministry of Economy, Trade and Industry in Japan. To align the NZIMM with prevailing market practices, it is recommended that upstream methane intensity be calculated on an HHV basis, with the same heating value applied consistently to the numerator and denominator.

Defining a "near-zero" upstream methane intensity

A common definition of near-zero emissions intensity is imperative to enable buyers, sellers, policy makers and other stakeholders to set targets and measure progress. Several definitions of "near-zero" (Table 2.5) are currently in use, many of which are difficult to compare directly because they rely on different intensity formulas.

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Table 2.5 Existing definitions of "near-zero" upstream methane intensity

Organisation	Segment covered	Intensity formula	Near-zero benchmark	Benchmark using IEA formula
OGCI	Upstream oil and gas (wellhead to first point of sale)	Volume of methane emissions per volume of marketed natural gas	0.10%	0.05%
OGDC	Upstream oil and gas (wellhead to first point of sale)	Volume of methane emissions per volume of marketed natural gas	0.20%	0.11%
ONE Future	Natural gas production	Total methane emissions divided by gross gas production	0.28%	0.34%
ConocoPhillips	Oil and gas production	Gross methane emissions divided by gross natural gas production	0.15%	0.08%

Notes: The OGCI target was initially set at 0.2% in 2021, and in 2026 OGCI set out an aim to collectively reach 0.1% by 2030. The Oil and Gas Decarbonisation Charter (OGDC) was launched at COP28 (2023) and set a "near-zero target" using the OGCI formula. The ONE Future Protocol establishes separate segment-specific intensity targets for gathering and boosting (0.08%), gas processing (0.11%), gas transmission and storage (0.30%) and gas distribution (0.23%). ConocoPhillips has its own near-zero methane intensity target of 0.15% by 2030. Where benchmark formulae include both oil and gas production (all except ONE Future), we assume an illustrative 1:1 ratio of oil and gas production to account for the IEA formula including both oil and gas marketed production in the denominator. For the ONE Future benchmark, we do not include marketed oil in the denominator, as this initiative only covers gas production. The ratio of gross production to marketed production is assumed to be 0.9 based on the 2020-2025 average from the United States Energy Information Administration (EIA) data. Natural gas and methane are converted from volume to energy terms using higher heating values of 34.6 and 37.7 MJ per m^3, respectively.

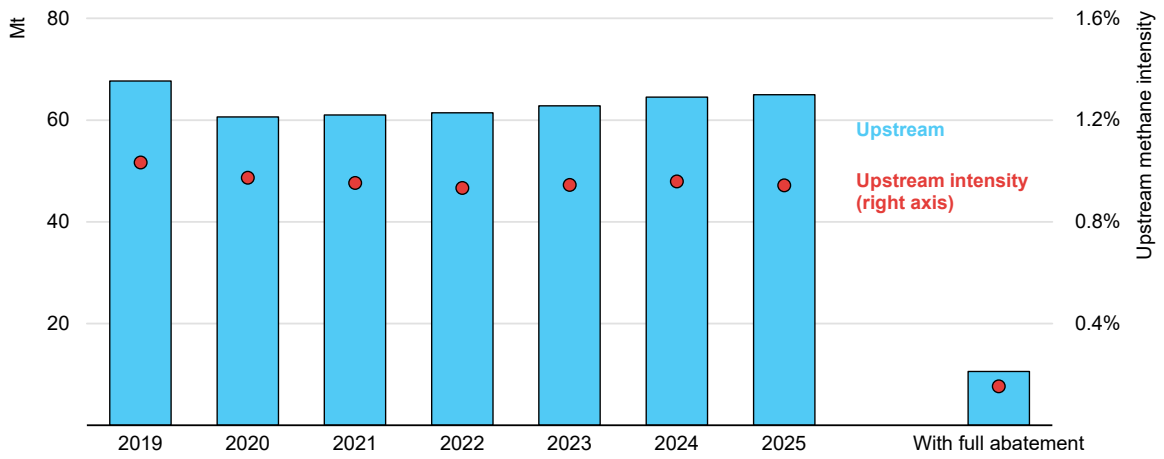
Sources: IEA analysis based on data from OGCI; OGDC; ONE Future; ConocoPhillips.

The near-zero benchmark needs to be established with reference to both existing technical abatement potential as well as current upstream performance across operators and countries. According to IEA analysis, the global average upstream methane intensity of oil and gas currently stands at around 1% (consistent with the MiQ-Highwood Index, which also estimates a 1% methane intensity for the US upstream natural gas sector).

Around 75% of upstream oil and gas emissions can be abated with existing technologies, including by limiting routine flaring and venting, adopting leak detection and repair (LDAR) programmes, and upgrading leaky and high-emitting equipment. If all technically feasible abatement options were implemented on a global level, this would lower the global average intensity to less than 0.2% using the IEA's recommended formula (Figure 2.5).

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Figure 2.5 Global emissions and emissions intensity from upstream sources, 2019-2025



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Note: Intensity is defined as the energy content of methane emissions from oil and gas production activities divided by total energy content of marketed natural gas and oil production. All energy is on an HHV basis.

To drive progress at the global level beyond what is already technically achievable, the near-zero benchmark can be set below 0.2%. Available data indicate that many operators are already performing below this level. Among OGCI's twelve member companies, the average weighted upstream methane intensity across operated assets in 2025 was 0.04% using the IEA's recommended formula (see Table 2.6).

Performance is also below the 0.2% threshold for many other companies outside the OGCI. As part of an upcoming Pledges to Progress report, we examined reported emissions data for a broad range of companies. Of the 63 companies for which both methane emissions and production data were available,[3] we find that in 2025, 45 companies (71%) had an operated upstream intensity below 0.2%, while 33 (52%) achieved an intensity below 0.1% (using the IEA's recommended formula). The average weighted upstream methane intensity among these companies was 0.15% in 2025. These figures reflect company-level performance rather than the asset-level approach proposed by the IEA, but they highlight that substantially lower intensity levels may be achievable.

[3] In 2025, 69 companies publicly reported methane emissions. Methane emissions intensities were calculated for the 63 companies for which production data were available from Rystad Energy.

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Table 2.6 Average weighted upstream intensity performance using IEA-recommended formula

Segment covered	2023	2024	2025
OGCI companies	0.05%	0.04%	0.04%
P2P companies	0.15%	0.14%	0.15%

Notes: OGCI = Oil and Gas Climate Initiative. P2P companies = companies covered in the Turning Pledges into Progress report. Intensity is defined as the energy content of methane emissions from oil and gas production activities divided by total energy content of marketed natural gas and oil production. All energy is on an HHV basis.

Source: IEA analysis based on company-reported methane emissions data and Rystad operated marketed production data. Reported intensities are not consistently subject to third-party verification and may therefore be subject to uncertainty. Reporting boundaries may vary across companies and may include different segments of the value chain.

Estimated country-level upstream intensities also support a benchmark below 0.2%. Certain countries produce oil and gas with national upstream intensities well below this level. According to IEA estimates, Norway currently has an upstream methane intensity for oil and gas production of around 0.01%. If all countries matched Norway's emissions intensity, global methane emissions from oil and gas operations would fall by more than 90%.

Taking these factors into account, the IEA recommends setting the near-zero benchmark at 0.1% – broadly equivalent to an intensity of 0.1 kg CH_4/boe. This level is consistent with leading operational performance observed among countries and companies – recognising, however, that reported data may underestimate actual methane intensity and may not be fully representative of the broader population of oil and gas companies globally.

As the NZIMM expands to cover additional segments of the oil and gas value chain, further benchmarks may be needed to reflect the specific characteristics of each segment. In the meantime, a production-only benchmark of 0.1% can provide a clear signal to drive further progress and incentivise emissions reductions. This benchmark should initially remain stable to support a common understanding of "near-zero" and provide producers with the certainty needed to invest in methane abatement technologies. Over time, consideration could be given to progressively increasing its ambition as industry-wide performance improves and producers move closer to meeting the benchmark.

Using a grading system to demonstrate progress towards "near-zero" methane intensity

For a marketplace to function effectively, buyers need a simple framework for understanding and comparing the emissions performance of different assets. An alphabetical grading system offers an intuitive way to communicate performance, as demonstrated in sectors such as bond markets, home appliances, food products and the certified gas market.

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The IEA therefore recommends a grading scheme to benchmark the methane performance of assets, giving fossil fuel buyers a clear snapshot of each asset's emissions performance. The proposed grading scheme ranges from A to F and is based on asset-level methane intensity, calculated using the IEA's proposed methodology (Figure 2.6).

Grades are distributed proportionally according to reported company performance and estimated upstream country-level intensities (see Figure 2.7). To encourage continued mitigation efforts, two grades fall below the "near-zero" threshold of 0.1%: A for intensity below 0.05% (in line with current OGCI performance and slightly above Norway's current intensity), and B for intensity of 0.05% to below 0.1%. This approach is also aligned with MiQ's grading scheme for natural gas operations, which uses comparable thresholds for A and B grades (Box 2.6).

Figure 2.6 Proposed methane intensity grading scheme

Grade	Intensity (%)	Intensity (kgCH4/boe)
A	Less than 0.05%	Less than 0.06
B	Less than 0.1%	Less than 0.1
C	Less than 0.5%	Less than 0.6
D	Less than 1.0%	Less than 1.1
E	Less than 2.0%	Less than 2.2
F	Greater than 2.0%	Greater than 2.2

Near-zero intensity threshold

Current global upstream average

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Notes: Intensity (%) is defined as the energy content of methane emissions from oil and gas production divided by total energy content of marketed natural gas and oil production. For intensity in kg CH_4/boe, methane is assumed to have a higher heating value of 55 MJ/kg, and 1 boe is assumed to be equivalent to 6.1 GJ. All energy is reported on an HHV basis.

The current global average upstream intensity of 1% provides a midpoint for the grading scale (Figure 2.7). Assets with an intensity below 0.5% (half the global average) receive a C, while those between 0.5% and 1% receive a D. An E corresponds to an intensity between 1% and 2%, and an F to an intensity of 2% or higher, consistent with the average intensity of the world's worst-performing countries.

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Box 2.6 Certification schemes as a pathway for differentiation

Several certification schemes have emerged in recent years with the goal of assessing the environmental and social performance of oil and gas production, including methane performance. These schemes seek to verify production practices against defined standards, enabling certified producers to differentiate their oil and gas supplies from those of producers with comparatively weaker performance.

Certification is a voluntary process. When an operator chooses to have its production certified, the operator's facilities are examined by an independent third party against the relevant standard. In 2024, around 320 bcm of natural gas was certified, equivalent to around 7.5% of global production, with certification activity concentrated in the upstream North American natural gas sector.

Among existing certification schemes, MiQ is the largest and most directly relevant to methane emissions reduction. Established in 2020 by the Rocky Mountain Institute, MiQ is a UK-based non-profit organisation that certifies oil and gas production using an A-to-F grading scale. The grading methodology combines three indicators: company practices (e.g. the implementation of regular leak detection and repair programmes); monitoring technology deployment (i.e. the extent to which continuous or periodic methane measurement technologies are used); and methane intensity. For the latter, the grading system sets minimum intensity thresholds of 0.05% for grade A, 0.1% for grade B, 0.2% for grade C, 0.5% for grade D, 1% for grade E and 2% for grade F.

As of October 2026, 21 operators had facilities certified under MiQ across North America, Germany, the Netherlands and the United Kingdom. These facilities covered approximately 300 bcm of natural gas and 0.7 mb/d of crude oil production annually. MiQ certificates can be traded through bilateral agreements or dedicated trading platforms, including Certified Gas Hub and Xpansiv's CBL Global Spot Exchange. Buyers of MiQ-certified natural gas have included Centrica, Southstar and Meta. Gas buyers have collectively claimed approximately 500 Mmbtu of certified gas to date. Although initially developed as a voluntary certification mechanism, MiQ could also help support compliance with emerging regulatory requirements, including those under the European Union Methane Regulation, through its Certificate Inter-Regional Import System (CIRIS).

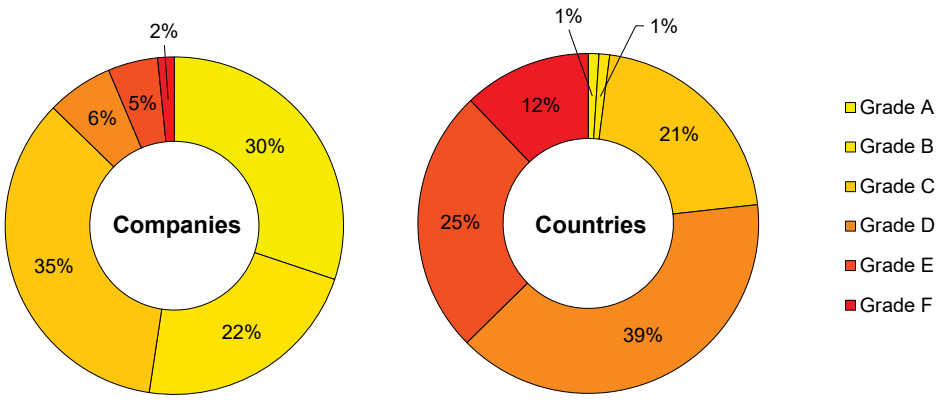
Other certification schemes include Equitable Origin (EO) and Project Canary. EO is a non-profit organisation that assesses environmental and social performance broadly, extending beyond methane emissions. Facilities are graded on a scale from A+ to C, based on the extent to which they meet, exceed or demonstrate leadership in industry best practices. Project Canary previously provided certification services at the well or basin level on a for-profit basis but ceased accepting new certification customers in 2024.

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The grading scheme presented in this report is indicative. Future work will also need to address the interaction between quantification uncertainties and the grade bands. Many operators report emissions with an associated uncertainty range (i.e., plus or minus a certain value). Operators could be required to provide a central estimate within that range, which would then be used to calculate the intensity score.

The IEA's recommended intensity grade assesses upstream methane performance at the asset level but does not directly link that performance to a specific marketed volume, cargo, or delivery. Future work will need to examine how asset-level performance can be attributed to marketed volumes and used to substantiate claims about specific crude streams, gas deliveries or LNG cargoes. This will require appropriate rules and mechanisms for attribution, chain of custody, accounting, product identification and the prevention of double-counting. It will also need to address traceability challenges arising from the aggregation, blending or commingling of oil and gas, as well as cases where the asset operator differs from the entity marketing the resulting product. The European Commission's recommendation on compliance solutions for the European Union Methane Regulation, released in July 2026, can inform future work on these issues.

Figure 2.7 Share of companies and countries in proposed grading levels, 2025



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Notes: Share is by count of companies and countries (respectively). Company intensity grades are calculated by dividing self-reported values from 63 companies by Rystad operated marketed oil and gas production. Reported emissions are not consistently subject to third-party verification and reporting boundaries may vary across companies, meaning that intensities may be subject to uncertainties. Country intensity grades are based on the national upstream intensity of 89 countries as calculated under the IEA Global Methane Tracker. Grades are based on company and country averages. Grades are based on the company performance are based on company averages, rather than being applied at the asset level. The proposed NZIMM framework is on grading at the asset level. Grading should, accordingly, be understood as indicative only. The performance of individual assets within specific countries or within company portfolios may vary from the national or company average.

In addition, the IEA's proposed methane intensity grade does not provide a comprehensive assessment of a supply source's overall greenhouse gas (GHG) emissions. It excludes other significant sources, including reservoir CO_2, combustion and other short-lived climate pollutants. A strong methane intensity grade should therefore not, on its own, be taken as evidence of low lifecycle GHG emissions.

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Chapter 3. Measuring data quality

Methane emissions can be quantified using a range of methodologies with varying levels of reliability. Some methodologies entail a lower level of accuracy and can underestimate emissions from oil and gas operations, undermining buyers' confidence in reported figures. This confidence may be further eroded when emissions reports are disclosed without independent third-party verification.

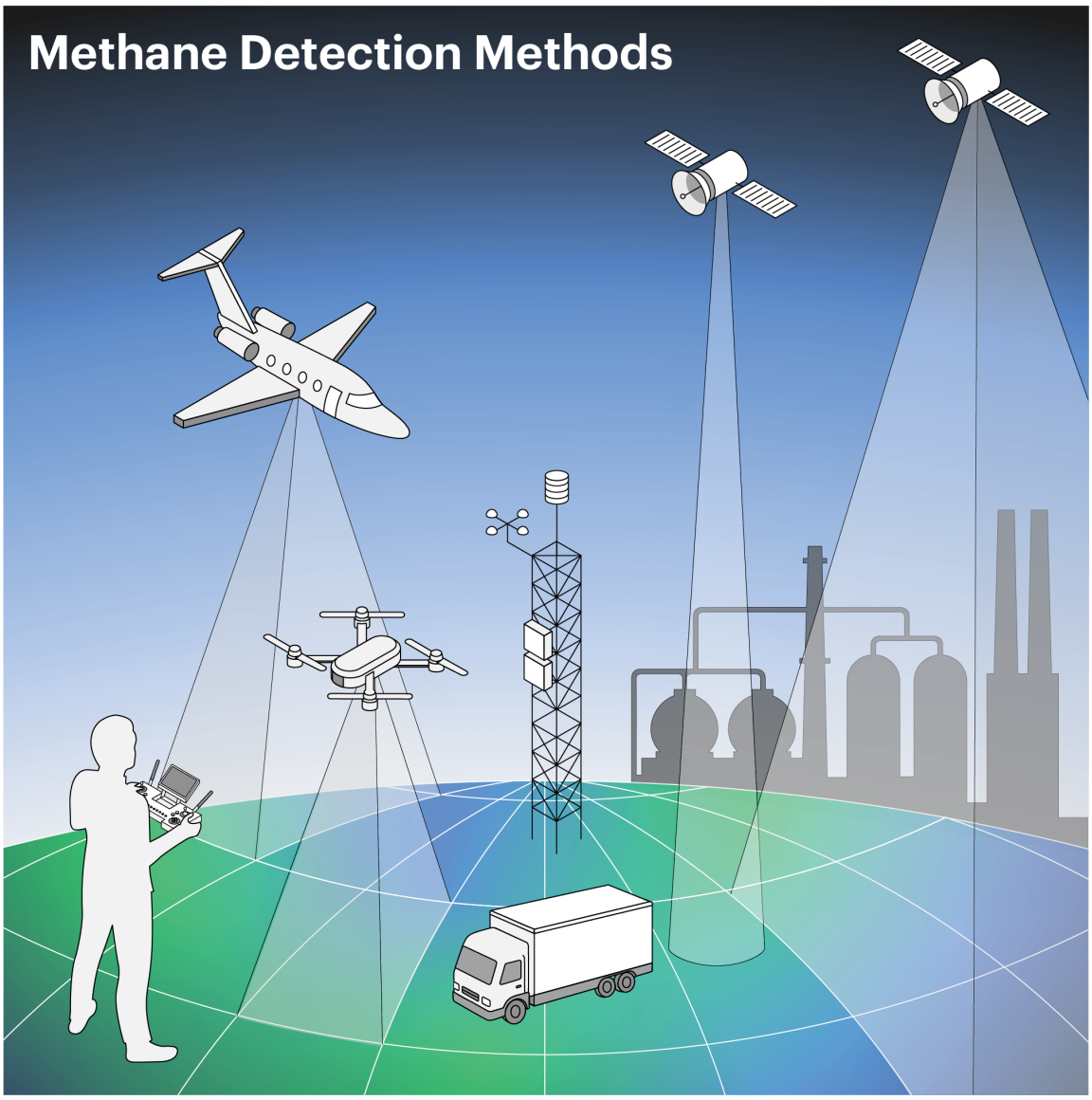
Buyers currently have limited visibility into how producers quantify emissions at their assets or how reliable the resulting data are. A data-quality grade can clarify the methodology used and help buyers assess how much trust to place in the data. This chapter sets out a framework for measuring and reporting data quality, including indicators to assess data quality and a grading scheme for scoring reliability. It also establishes criteria for independent third-party verification of grades and explores possible models for disclosing and trading verified upstream performance.

Approaches to quantifying methane emissions

A well-functioning near-zero intensity methane marketplace (NZIMM) rests on robust accounting of methane emissions. For buyers to favour fuels with lower methane intensities, producers must quantify emissions associated with their operations. Quantified emissions must then be disclosed to prospective buyers to enable performance-based purchasing.

Operators currently use a range of methodologies to quantify methane emissions and compile asset-level or company-wide inventories. Some rely on generic emission factors (GEFs) to estimate emissions at a relatively low level of granularity, without systematically distinguishing between individual emission sources. These approaches typically combine activity data (e.g. equipment counts, the scale of operations or oil and gas production volumes) with standardised emission factors or engineering-based calculations. Most national emission inventories, including those for the United Nations Framework Convention on Climate Change (UNFCCC), as well as many company inventories rely on these methods. Other operators use source-specific emission factors or company-specific methodologies to produce more granular inventories. By accounting for the characteristics of individual emission sources and the conditions under which assets operate, these approaches can yield more representative estimates of methane emissions.

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Technology family	Typical scale covered	Purpose	Key limitations
Global satellites	Regional	Flagging hot spot basins, long term trends, inventory checks	Miss most individual leaks; attribution is coarse only
Targeted imaging satellites	Basin to facility	Finding large super emitters at named facilities	Limited small leak sensitivity; tasking capacity finite
Aircraft mounted sensors	Basin to facility	Measuring total emissions from clusters, validating satellites	Costly and episodic; needs planning and aviation access
UAV/drones	Facility	Checking priority sites, verifying fixes, mapping plumes	Weather, airspace rules, battery limits
Ground-based tower	Field to facility	Quantify methane fluxes and high temporal precision	Placement constraints; overlapping sources
Mobile labs (vehicles)	Facility	Estimating source strengths along roads, checking networks	Limited off road reach; depends on road access and traffic
Handheld and on site instruments	Components	Pinpointing leaks, confirming repair, compliance checks	Very local; needs trained staff on the ground

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Operators also differ in the extent to which they use measurement technologies to quantify emissions. In recent years, a range of new technologies has emerged that can measure atmospheric methane concentrations and infer emission rates for specific facilities or sites. These include airborne and satellite-based systems, as well as ground-based instruments (including continuous monitoring devices). Operators can use the resulting emissions rates to estimate emissions at individual facilities or sites. Some operators rely entirely on GEF-based methods, without using measurement technologies. Others use measurement data to derive source-specific emission factors for a given asset. They may also extrapolate these source-specific emission factors to other assets, including those in different basins or countries. At the other end of the spectrum are operators that conduct comprehensive site-level measurement campaigns annually (or more frequently) and incorporate the results into their emissions inventories.

Although operators use different approaches to quantify methane emissions, these methods do not all possess the same level of accuracy or representativeness. Inventories based solely on GEFs (without source-specific emission factors or site-level measurement data) may underestimate actual emissions. Studies conducted using airborne or satellite data in different regions suggest that true emission levels are often higher than reported. Measurement-based studies indicate that inventories relying solely on GEFs often fail to capture certain emissions, including those from unidentified sources, or may miss unintentional releases resulting from unplanned events or abnormal operating conditions. In the United States, such studies suggest that production-related emissions are 1.5 to 2 times higher than those reported in official Environmental Protection Agency (EPA) inventories. Studies in Canada have reached similar conclusions.

Discrepancies between measurement-based studies and GEF-derived figures can reflect the use of outdated emission factors that may not accurately capture intentional or fugitive emissions. Methane emissions can also vary widely depending on factors such as facility design, equipment age and weather conditions, as well as maintenance and operating practices. Emissions often follow a highly skewed ("fat-tailed") distribution, whereby a relatively small number of super-emitting events (caused by abnormal operating conditions or equipment malfunctions) account for a disproportionate share of total emissions. Incorporating measurement-derived data into emission inventories – either through source-specific emission factors or site-level measurements – can reduce uncertainty and improve the accuracy of reported emissions.

The NZIMM should therefore incentivise producers to use measurement-informed inventories, which are less likely to underestimate emissions than GEF-based ones. Producers that use measurement technologies should be recognised for these efforts and this information should be communicated to prospective buyers.

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Giving greater weight to measurement-informed reports can build confidence among fossil fuel buyers, who might otherwise question whether reported emissions reflect actual levels, slowing the development of a differentiated market.

At the same time, the NZIMM should seek to accommodate producers that are still developing their methane quantification capabilities and have yet to incorporate measurement technologies into their inventories. Although some existing methane initiatives set minimum data-quality requirements, overly stringent standards risk excluding producers that lack access to measurement technologies or the capital to deploy them. This could restrict market participation to large, well-resourced producers, undermining the NZIMM's inclusiveness and limiting additional methane emission reductions.

To balance accuracy with the need for market participation, the IEA recommends introducing a data-quality score that reflects the accuracy and reliability of producers' methane emissions estimates. This would help buyers assess the reliability of reported intensities, while enabling producers with limited access to measurement technologies (particularly in developing economies) to participate in the market and improve the quality of their emissions data over time.

The following section sets out a proposed data-quality metric using an A–F grading scale. The metric is designed to be technology-neutral, reflecting the dynamic nature of the oil and gas sector and ongoing technological advances. Future work should nevertheless consider setting minimum detection thresholds for measurement technologies, validated through controlled-release testing.

Designing a data-quality score for methane emissions quantification

A data-quality score can give prospective buyers a clear assessment of the reliability of reported methane intensities (see Chapter 2). The score would reflect the methodology used to quantify emissions, with measurement-informed approaches receiving the highest scores.

Existing initiatives and methodologies provide a sound basis for developing a data-quality framework. The United Nations Environment Programme's (UNEP) Oil and Gas Methane Partnership (OGMP) 2.0 reporting framework, for example, is a principles-based reporting framework based on five levels of methane emissions quantification (see Table 3.1). Launched in 2020, OGMP 2.0 has won broad industry support and now includes more than 160 participating companies covering roughly 43% of global oil and gas production.

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Table 3.1 Overview of OGMP 2.0 reporting levels

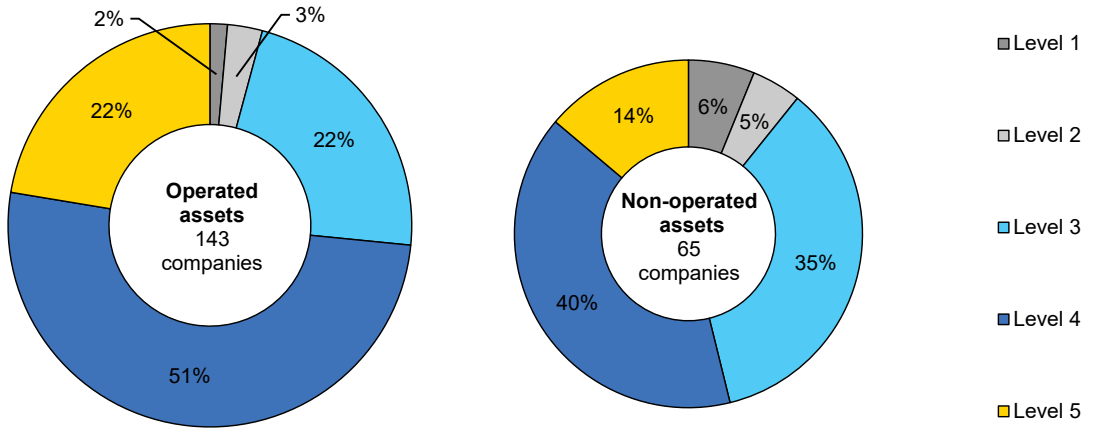
OGMP 2.0	Description
Level 1	Emissions are reported at asset or country level. A single, consolidated methane emissions number covers all operations within an asset or all assets within a region or country. Quantification is done using high-level standard factors, with no breakdown by emissions category or source type.
Level 2	Emissions are reported using simplified categories based on those used by IOGP and MARCOGAZ. Quantification typically relies on generic emission factors (GEFs), although more advanced methods may also be used.
Level 3	Source-level reporting begins at this level, with emissions allocated to individual source types across 14 core categories and quantified using GEFs.
Level 4	Emissions are reported by detailed source type and quantified using specific emission and activity factors. Company-specific methodologies may include direct source-level measurement, measurement-based emission factors, engineering calculations, or a combination of these approaches.
Level 5	Emissions are reported as under Level 4, with the addition of site-level measurements that are reconciled with source-level ones. Site-level measurements complement, rather than replace, source-level estimates. Operators must also report the uncertainty associated with measured emissions.

Notes: OGMP = Oil and Gas Methane Partnership; MARCOGAZ = Technical Association of the European Gas Industry; IOGP = International Association of Oil and Gas Producers.

Source: IEA analysis based on data from UNEP's International Methane Emissions Observatory.

According to OGMP 2.0 Company Factsheets, out of 143 companies participating in OGMP 2.0 in 2025, 32 (or 22%) achieved Level 5 for operated assets (Figure 3.1). A smaller number of companies (65) disclose reporting levels for non-operated assets. Reporting levels tend to be lower for non-operated assets, with only 9 companies (14%) achieving Level 5 in 2025. The proportion of Level 1 and 2 scores for non-operated assets (11%) is also higher than for operated ones (5%).

Figure 3.1 Share of companies under each of OGMP 2.0's five reporting levels, 2025



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Source: IEA analysis based on data from 2026 Oil & Gas Methane Partnership (OGMP) 2.0 Company Factsheets.

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Feedback received by the IEA in Q2 and Q3 of 2026 indicated a strong preference to align the NZIMM's data quality framework with existing initiatives, including OGMP 2.0. Incorporating OGMP 2.0's five-tier approach into the NZIMM could reduce administrative burden for companies and accelerate the NZIMM's adoption. According to UNEP analysis, the share of global oil and gas production at Level 5 is expected to reach 31% by 2030. It could also support alignment with the European Union Methane Regulation, which recognises Level 5 as a means of demonstrating compliance with the Regulation's monitoring, reporting and verification requirements for imported fossil fuels.

At the same time, the IEA's consultations revealed that buyers need assurance that producers' annual emissions inventories do not underestimate emissions. Assessing producers on their site-level measurement practices, based on objective and consistently-applied indicators, is needed help strengthen buyers' confidence in the completeness of emissions inventories and enable meaningful comparisons. Without common objective indicators, variations in reported emissions may simply reflect differences in measurement and reporting practices rather than actual emissions levels.

The IEA accordingly recommends developing a data-quality framework that builds upon existing initiatives (in particular OGMP 2.0) while introducing selected indicators to measure a producer's asset-specific measurement practices. Drawing on work undertaken as part of OGMP 2.0 and the MMRV Working Group (see Box 3.1), the IEA's recommended framework rests on three indicators and includes five tiers (see Table 3.2).

The three indicators are: the methodology used to quantify emissions, the frequency of site-level measurement, and the coverage of site-level measurement. The first indicator leverages OGMP 2.0's five reporting levels, while the two latter indicators build on top of OGMP 2.0. Administrative burden is expected to be limited for most companies, as companies participating in OGMP 2.0 would likely already have access to information on the frequency and coverage of site-level measurements. As such, the data quality framework is unlikely to generate significant additional reporting burdens for producers. A more detailed explanation of each indicator is included below:

- **Emission-quantification methodology.** This indicator assesses the producer's overall approach for quantifying methane emissions from its operations. It builds on OGMP 2.0's five-level reporting framework, which is already widely familiar to industry players. The scoring rewards producers that incorporate measurement data into their emissions inventories: emissions based on low-granularity GEFs receive lower scores, while measurement-informed inventories receive the highest scores.

- **Site-level measurement frequency.** This indicator assesses how frequently the producer conducts site-level measurements. As noted, methane emissions are highly variable and can arise from unplanned or abnormal events. Direct site-level

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measurements can improve the accuracy and representativeness of emissions inventories. However, measurement technologies are subject to inherent limitations. In particular, certain technologies – such as aircraft-mounted sensors and drones – are constrained by temporal and meteorological conditions. They typically provide a snapshot of emissions at a given point in time and may be affected by factors such as cloud cover, wind conditions and physical access constraints. Consequently, measurements conducted over a limited period may not adequately capture the variability and intermittency of methane emissions. Increasing the frequency of site-level measurements can help address these limitations, reduce measurement-related uncertainties and improve the robustness of emissions estimates. Accordingly, higher measurement frequency within the reporting year is associated with a higher score.

- **Site-level measurement coverage.** This indicator assesses the coverage of the producer's site-level measurement activities. Oil and gas assets vary in size and configuration, with some assets (particularly onshore) comprising multiple different sites. For example, one producer's asset may contain multiple different wellheads. Measuring only a small proportion of sites within the overall asset can increase the risk of emissions going undetected. Quantification uncertainties can be reduced by ensuring that a broader number of sites within the asset is covered by site-level measurement activities. The greater the percentage of sites covered within the asset, the greater the score.

Table 3.2 Five-tier framework for assessing data quality

Score:	1	2	3	4	5
Quantification approach (70% weight)	Producer quantifies emissions by calculating a single consolidated emissions number for the entire asset	Producer quantifies emissions by breaking down emissions into simplified source categories and using GEFs	Producer quantifies emissions by breaking down emissions into specific source categories and using GEFs	Producer quantifies emissions by breaking down emissions into specific source categories and using measurement-based, site-specific emission factors	Producer quantifies emissions through site-specific emission factors (i.e. Tier 4) and reconciles bottom-up quantification with site-level direct measurements
Frequency of site-level measurement (15% weight)	No site-level measurement conducted in the reporting year (score = 1)			At least one site-level measurement conducted within the reporting year	More than one site-level measurement within the reporting year, or continuous monitoring
Coverage of site-level measurement (15% weight)	Less than 20% of sites covered	More than 20% of sites covered	More than 50% of sites covered	More than 80% of sites covered	100% of sites covered

Note: GEF = generic emissions factor.

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Together, the three indicators assess the precision and accuracy of the source-level quantification methods underpinning an operator's emissions inventory and account for potentially undetected emissions by incentivising frequent, comprehensive site-level measurements. At least once a year, the results of site-level measurements should be reconciled against the source-level emissions inventory. By using this approach, the three indicators provide an indication of how accurately the annual inventory reflects actual emissions from the asset.

Box 3.1 The MMRV Working Group

Launched in November 2023, the International Working Group to Establish a Greenhouse Gas Supply Chain Emissions Measurement, Monitoring, Reporting, and Verification Framework (MMRV Working Group) seeks to develop a global framework for measuring, monitoring, reporting and verifying greenhouse gas (GHG) emissions across international natural gas supply chains. Its proposed framework aims to provide market participants with comparable and reliable information on emissions intensity from pre-production through delivery, enabling comparisons of supply chains according to GHG emissions. Key elements include:

- Building upon existing initiatives, including OGMP 2.0, to establish consistent technical criteria for quantifying and reporting GHG emissions, with measured data preferred over modelled data and estimates.
- Requiring independent third-party certification of emissions, supported by common criteria for assessing the accuracy, representativeness and completeness of reported data.
- Establishing an accreditation process to ensure that certification bodies are qualified, independent of reporting entities and verify information in accordance with the framework.
- Defining requirements for receiving, tracking and retiring GHG attestations across the natural gas supply chain.

Participating countries are not required to introduce regulatory standards in line with the framework, which does not prescribe performance-based reduction targets. Instead, the MMRV framework is intended to serve as a consensus-based standard that buyers and sellers can adopt voluntarily. As of October 2024, the Working Group included more than 20 participating countries.

The MMRV Working Group last convened in October 2024, when it announced a consensus on the design architecture for a future MMRV system. The proposed architecture includes a data-quality indicator score, ranging from A to F. Building on earlier proposals, the score is based on five indicators: data reliability, temporal correlation, geographic correlation, technology correlation and data-collection methods.

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All measurement technologies do not have the same detection capabilities. As the NZIMM evolves and further work is undertaken to refine the framework, consideration could be given to establishing minimum detection thresholds and defining the measurement resolution required for different technologies to qualify under the data quality framework. For example, satellite-based measurements can provide valuable insights for emissions inventory verification; however, their relatively coarse spatial resolution and limited source attribution capabilities may constrain their ability to identify individual emission sources and detect smaller, isolated leaks. The framework could therefore clarify the minimum detection sensitivity and spatial resolution required for a measurement to qualify as a "site-level measurement" for scoring purposes.

For each asset, a producer's quantified annual methane emissions are scored from 1 to 5 for each of the three indicators. The thresholds are defined as discrete tiers, with producers assigned a whole-number score according to the tier in which they fall. Each indicator is weighted according to its relative importance. The quantification approach is assigned the highest weight (70%), reflecting its primary role in determining the accuracy and precision of emission inventories. The frequency and coverage of site-level measurements are each assigned a weight of 15%, reflecting their complementary roles.

For the measurement frequency indicator, the absence of any site-level measurement during the quantification year results in a score of 1. One completed site-level measurement earns a score of 4, while two or more earn a score of 5. The frequency thresholds have been selected to reflect current industry practices and operational feasibility. Repeated site-level measurements within a single year can be costly and pose practical challenges for certain assets, particularly offshore facilities. The proposed approach therefore balances the need for accurate emissions quantification against the resources required from producers, while seeking to avoid diverting capital from emissions mitigation.

For the measurement coverage indicator, scoring is based on the proportion of an asset's sites that are covered by measurement activities (i.e. the sample size). The indicator is based on the *cumulative* coverage across measurements: where measurement activities cover the same sites, coverage is counted only once. For example, two campaigns each covering the same 30% of sites would result in an overall coverage of 30% and a score of 2. By contrast, two campaigns each covering a different 30% of sites would result in cumulative coverage of 60% and a score of 3.

As the NZIMM evolves, its data-quality requirements could be progressively strengthened to improve the robustness and accuracy of reported emissions. The coverage indicator could, for example, be refined to assess the proportion of emissions sources covered by site-level measurements, rather than the proportion

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of physical sites – incentivising operators to prioritise the measurement of larger emission sources. As monitoring and measurement practices mature, data-quality requirements could also be made progressively more stringent, supporting continuous improvements in emissions quantification. Transitional arrangements could also be considered for assets operated by producers that are at an early stage of methane quantification or face barriers to accessing measurement technologies, for example in developing economies.

Weighted scores for the three indicators are combined to produce an overall score from 1 to 5. This combined score is then assigned a grade according to the ranges set out in Table 3.3. The grading scale provides greater granularity at the upper end, creating stronger incentives to use higher-quality data. The ranges are indicative and may be refined as the NZIMM framework develops and discussions progress.

Table 3.3 Indicative data-quality grading scheme

Grade	Score
A	≥ 4.5
B	≥ 4.0
C	≥ 3.5
D	≥ 3.0
E	≥ 2.0
F	1.0 – 2.0

Collecting the necessary data and calculating this score should not pose significant challenges for most producers that already participate in OGMP 2.0, as they should already have access to information on the frequency and coverage of site-level measurements. As such, the calculation of the score itself is unlikely to generate significant additional reporting costs for producers that are already part of OGMP 2.0.

Feedback received by the IEA throughout Q2 and Q3 of 2026 highlighted the importance of ensuring consistency across reporting requirements and avoiding the fragmentation of reporting practices, particularly in relation to the European Union Methane Regulation. To do so and reduce the risk of duplicative reporting requirements and unnecessary administrative burdens for producers, the IEA proposes a dedicated data-quality pathway for assets that are fully compliant with the European Union Methane Regulation. Asset-level methane emissions that are subject to MRV in accordance with the Regulation's requirements would automatically receive a B grade for data quality. This would cover producers meeting the relevant domestic MRV requirements, OGMP 2.0 Level 5 requirements, or future ISO standards on MRV currently under development at the request of the European Commission, as applicable. Producers could still

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qualify for an A grade under the NZIMM data-quality framework, but would need to comply with the requirements set out in above in order to receive such a grade.

A producer's data-quality score is always to be disclosed alongside the methane-intensity score, giving buyers insight into both emissions performance and the reliability of the reported data. The two grades could be combined in 36 possible ways (e.g. AA, BE, CD, EB), reflecting the six grades available for each indicator. During consultations, some stakeholders expressed concern that the number of possible combinations could confuse buyers and undermine the credibility of the NZIMM. They suggested introducing minimum data-quality requirements instead.

We nonetheless recommend retaining the A–F scale for data quality. This is because minimum requirements could exclude producers that are at an early stage of methane quantification, particularly in developing economies, and therefore restrict participation to producers that have already achieved low emissions – limiting opportunities for additional emissions reductions. Disclosing the data-quality grade alongside methane intensity helps address credibility concerns: buyers that consider lower-quality methodologies insufficiently reliable can reflect this in their purchasing decisions. For example, they could reserve price premiums for producers achieving a score of AA, indicating both low methane intensity and high data quality.

As the NZIMM is further developed in 2027 and beyond, additional measures could be considered to mitigate the risk of perverse incentives and encourage continued improvements in data quality. For example, "near-zero" designation could be reserved for producers with a score of at least BB, thereby ensuring that such claims reflect both low methane intensity and a sufficient level of confidence in the reported emissions.

Enhancing trust through independent third-party verification

For a marketplace to function efficiently, buyers must trust the emission levels reported by sellers. Self-reporting of emissions can slow down market formation, as buyers may lack confidence that sellers have accurately and reliably quantified their emissions. Independent third-party verification can help build the required trust, but many reporting frameworks, including OGMP 2.0, still do not systematically require it. Moreover, even where it is required (as in certain certification programmes) concerns about the integrity and transparency of verification practices have undermined confidence in those schemes.

A well-functioning NZIMM needs common criteria for third-party verification that ensure independence, impartiality and technical rigour. Robust verification can strengthen buyers' confidence in low-intensity fuels and reduce the risk of

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greenwashing. The IEA therefore recommends that operators whose grades have not been independently verified by a third-party receive an automatic F grade for data quality.[1]

What documents and records should operators keep?

For verification to be performed effectively, verification bodies need access to operator documents and records. Effective verification therefore starts with common record-keeping requirements for operators.

Operators should retain all documents and records needed to assess an asset's emissions performance and verify its self-calculated dual-letter grades. This includes, at a minimum, all data elements listed in Table 3.4. Records should be kept for at least five years to enable comparisons across reporting years and allow amendments to be made if errors are subsequently identified.

Producers may already compile some of this data to meet regulatory requirements or participate in voluntary transparency initiatives. Where applicable, this data can be repurposed for the NZIMM. Operators should provide the verification body with access to the relevant information at the start of the verification process.

Table 3.4 Minimum record-keeping requirements for the NZIMM

Data elements
Operator name, address and contact information
Geographical location of asset, including country and sub-region
Asset name (if any)
Total annual methane emissions for the asset (in tonnes), broken down by emission source category (where reporting meets OGMP 2.0 Level 3 or above)
Total annual asset production in absolute values, including wellhead and saleable volumes split by type
Operator-calculated annual methane intensity for the asset, including the corresponding grade under the IEA methodology
Operator-calculated data-quality grade under the IEA methodology
Description and record of quantification methodologies used, including annual inventories, source-level results, extrapolation approaches and any site-level measurements conducted
Description of the methodology used to perform reconciliation between the emissions inventory and any site-level measurements
Description of the measurement technology, including its detection limits and evidence of prior validation

[1] One alternative would be to introduce a third grade to distinguish verified scores (V) from unverified ones (U), or simply to mark verified scores with an asterisk (*) or plus (+) sign. The IEA does not recommend either option as this would add complexity to the grading system without materially improving clarity or usability for buyers.

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Who can serve as a verifier?

Buyers' trust rests not only on the verification process itself, but also on who performs that verification. Perceived conflicts of interest can undermine confidence in the process. To reduce potential conflicts of interest, verifiers must operate independently from the operator, its equity partners and any technology providers involved in quantifying emissions. To ensure consistent practices in independence and impartiality, verification bodies should comply with relevant international standards, in particular ISO 14065, ISO 14066 and ISO/IEC 17029, which set requirements for environmental information validation.

Independence could be strengthened by limiting the period during which a verifier may verify the same operator (e.g. five years), reducing the risk of capture. Although operators typically pay for verification, alternative funding arrangements that separate verification activities and payment could further reduce perceived conflicts of interest. For example, industry associations could pool funds to pay independent auditors, ensuring they remain at arm's length from individual operators and assets. Additional safeguards could include external quality assurance of a random sample of verification results (although this could be introduced later to avoid adding complexity during the NZIMM's initial implementation).

In addition to being independent and impartial, verifiers must also be technically-competent to assess operators' emissions quantification methodologies and the accuracy and reliability of the resulting estimates. They must have demonstrated expertise and relevant experience in GHG emissions accounting, quantification and management.

Independence, impartiality and competence can be safeguarded by requiring verification entities to be accredited by an independent body or national regulatory authority. These arrangements provide a means of assessing whether verifiers have the necessary qualifications, systems and safeguards to exercise their functions effectively and impartially. Accreditation or authorisation should follow relevant international standards and best practices, in particular ISO 14065, ISO 14066 and ISO/IEC 17029. Effective governance arrangements, including clear oversight responsibilities for verifiers, are also critical. For example, MIQ publicly discloses its governance structure and the protocols governing its certification and registry systems.

Although oversight by accreditation bodies can strengthen confidence in the NZIMM, it is equally important to ensure that the accreditation process is completed in a timely manner, with a sufficient number of qualified entities available to conduct verification. Accreditation delays can hinder the implementation of methane-related frameworks. Governments can help prevent

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bottlenecks by working closely with operators, verification entities and accreditation bodies to establish clear, efficient procedures for timely accreditation (see Chapter 4).

Where verification capacity is insufficient or unavailable (particularly in developing economies), a phased implementation could be considered, with clearly defined transition periods to allow time for capacity to develop. Targeted training for verification bodies will be essential. Governments can support these efforts by working with industry to organise training programmes and, where appropriate, provide financial assistance, particularly in developing economies.

How should the verification process be carried out?

In order for emissions performance to be comparable across assets and operators in the NZIMM, verification approaches must be applied consistently and reliably. Inconsistent application of verification requirements could lead to differences in asset grades that reflect variations in verifiers' expertise or interpretation rather than actual differences in emissions performance.

Effective verification under the NZIMM therefore requires a consistent methodology to guide verification bodies. Operators, verifiers and governments should develop common criteria and harmonised rules for assigning letter grades for data quality and methane intensity. Multiple verification protocols could be recognised as meeting these criteria, including existing ones such as the University of Texas Energy Emissions Modeling and Data Lab's verification protocol for EUMR compliance, MiQ's audit protocol and ISO standards 14064-3, 14065 and 17029. MiQ's protocol draws on these ISO standards and is currently the only operational verification protocol specifically designed for methane. Recognising multiple protocols would allow the NZIMM to leverage existing approaches rather than delay implementation by developing a new protocol.

Third-party verification can be performed at different levels of assurance (see Table 3.5). A limited assurance model is primarily focused on detecting material errors or misstatements and typically involves more selective data testing, while a reasonable assurance model involves a more thorough assessment of reported emissions, typically using more in-depth verification procedures, such as recalculation, direct measurement, data testing and unannounced site visits.

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Table 3.5 Assurance levels for third-party verification

Assurance level	Description
Limited assurance	Less intensive verification process. Verification process relies more heavily on inquiry, analytical review and desk checks. Independent data testing is typically limited and risk-based, although it may include selected recalculations, data tracing and review of supporting documentation. Verification bodies assume the reported data are consistent with the estimates, and results are expressed in negative terms (e.g. "Nothing has come to our attention indicating material non-compliance with the reporting criteria").
Reasonable assurance	More in-depth verification process. Verification activities may include detailed data testing, recalculation, corroboration of evidence and random site visits. Verification body does not assume coherence of reported emissions data, and results are expressed in positive terms (e.g. "The reported information is materially accurate and compliant with the applicable criteria").

Notes: This table is intended to provide a simplified overview of the distinction between the two assurance levels. The activities described may not fully reflect those undertaken by verifiers in practice, as the scope and nature of verification activities may vary depending on the intended purpose of the emissions report.

For the NZIMM, the IEA recommends that third-party verification be performed at a reasonable assurance level. This is most likely to build buyers' confidence and support the development of the marketplace. It also aligns with requirements under existing methane-related frameworks, notably the European Union Methane Regulation, easing the compliance burden for operators. If an immediate transition to reasonable assurance is shown to impose disproportionate burdens, particularly in developing economies, a phased approach could be considered. During a transition period, limited assurance could be accepted, or third-party verification could initially focus on management systems rather than asset-level emissions.

As part of the verification process, third-party verifiers would need to review operators' self-assigned letter grades to assess their accuracy and reliability, including the emissions quantification methodologies used and the resulting calculations. In this context, verifiers could draw on independent sources to cross-check reported emissions, including relevant United Nations Environment Programme (UNEP) tools such as the Methane Emissions Index, the Methane Alert and Response System, and the Repository of Empirical Methane Emissions for Data Integration. Operators would be expected to provide verifiers with all information, documentation, access and assistance needed to complete the verification, including supporting documents and access to relevant sites and facilities, where applicable.

If, at the end of the process, the verification body concludes that the operator-calculated dual letter grades fairly represent the asset's emissions performance and have been calculated accurately, it issues a statement describing the verification activities undertaken and confirming the grades. If the verification body

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finds that the grades are inaccurate or misleading, it should ask the operator to recalculate them within a specified deadline. Operators that do not undergo third-party verification, or whose data are subject only to limited assurance, receive an F grade for data quality.

Supporting comparability through standardised disclosure criteria

Transparency is a fundamental aspect of a well-functioning marketplace. Buyers must be able to access and review information on operators' methane emissions performance to compare the performance of different fuel sources and choose those with lower methane intensity. Developing the NZIMM therefore requires determining how producers should document their performance and communicate it to buyers.

At what level of aggregation should performance data be disclosed to buyers?

Producer investment in methane abatement technologies depends on clear demand signals from fossil fuel buyers. The effectiveness of these signals, in turn, depends on access to comparable information on emissions performance across fuel sources. This requires not only a consistent formula for calculating methane intensity (see Chapter 2), but also standardised disclosure criteria. Without harmonised reporting criteria, producers' disclosure practices may diverge, creating an uneven playing field.

To ensure consistency, methane performance should be reported using common boundaries. In line with the IEA's recommendations for calculating methane intensity (see Chapter 2), we recommend disclosure at the asset level. Operators should, however, be required to disclose only the dual grades for methane intensity and data quality. This allows relevant information to be communicated without revealing underlying emissions or production data, balancing transparency with the protection of commercially sensitive information and supporting broad market participation. At the same time, producers should also be allowed to disclose absolute emissions voluntarily, enabling buyers and other stakeholders to assess whether emissions have fallen in net terms. Consideration could also be given to encouraging or requiring operators to disclose the share of their production assets that have been assessed under the NZIMM framework. Such disclosure could incentivise producers to progressively expand the coverage of their asset portfolios under the framework.

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Future work on appropriate models for disclosure and trading

Building the NZIMM also requires determining how emissions performance data will be disclosed to buyers and used in transactions between market participants. As noted, this report focuses on establishing a common global framework for assessing upstream methane performance, including a consistent definition of "near-zero" methane intensity. Further work will be needed to determine how verified upstream performance can be linked to marketed volumes, disclosed to buyers and reflected in commercial transactions.

Table 3.6 Overview of possible disclosure models for methane emissions performance

Model	Description	Public?	Advantages	Limitations	Examples
Pre-contractual disclosure scheme	Producers disclose performance data to prospective buyers during pre-contractual discussions	No	Ensures potential buyers have access to performance data before contract signature; protects confidential information	Lack of public disclosure can hinder comparability, weaken competitive pressure and increase transaction costs	EU Energy Performance of Buildings Directive
Sustainability disclosure regime	Large companies (in particular listed companies) publicly disclose performance in annual management reports through a standardised reporting format	Yes	Ensures performance data is widely available to the public, stimulating competition	Requires disclosure of potentially sensitive data; can generate compliance costs	EU Corporate Reporting Sustainability Directive
Emissions reporting framework	Producers report performance data to designated government authorities, who make emissions data available on a government-run platform	Yes	Single portal where emissions data can be accessed by buyers and other stakeholders	Requires creation and maintenance of a government-run platform	Canada's Greenhouse Gas Reporting Program
Labelling scheme	Performance data is attributed to specified goods through a label	Yes	Provides clear, simple and comparable performance information to customers	Severely limited where product is a fungible commodity that is not solid and individually-identifiable	UK Energy Label Scheme

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A key consideration in the development of disclosure models will be the extent to which emissions performance data is made publicly available. Different approaches are possible for sharing performance data and enabling buyers to make informed purchasing decisions (see Table 3.6). Some involve broad public disclosure, while others limit access to prospective buyers only. Any disclosure rules should be designed to be interoperable with existing regulatory requirements, including those established by the European Union Methane Regulation. Existing and emerging platforms could be leveraged to facilitate public disclosure of methane-related information, including IMEO's Eye on Methane data platform and the European Union's Methane Transparency Database, which is set to provide company-level information on the methane performance of EU producers and third-country exporters.

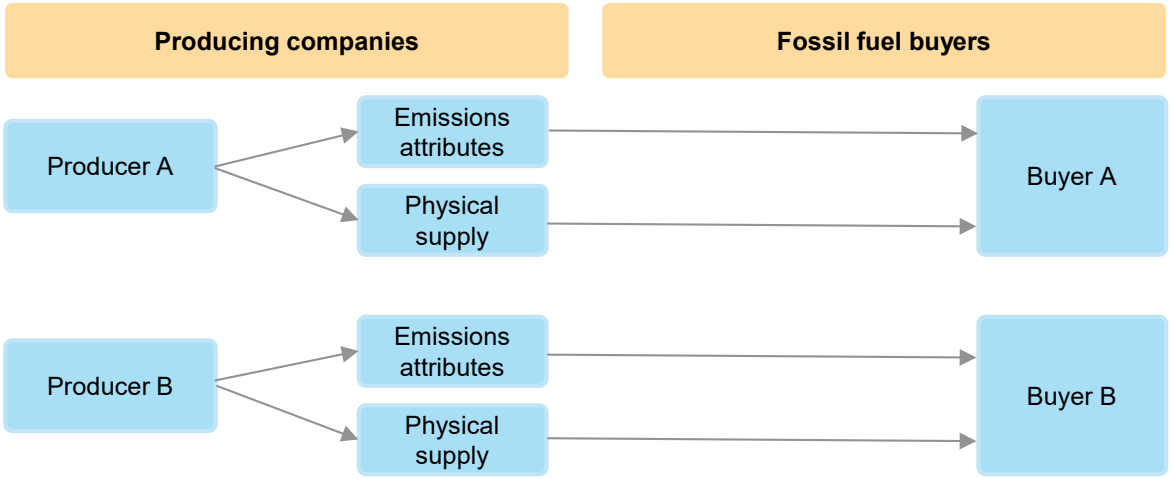
A related issue is how to integrate verified upstream performance into commercial transactions between market participants. Integrating verified upstream performance into commercial transactions will require addressing a range of operational, technical and institutional issues. These include approaches to attribution and accounting; chain-of-custody arrangements; the transfer and retirement of performance attributes; governance frameworks; model contractual clauses; technical infrastructure; trading mechanisms; registry development; and rules governing claims.

Different possible models exist for linking verified asset-level performance with a specific marketed volume, cargo or delivery. Some directly associate performance with marketed volumes by integrating performance into long-term contracts, while others decouple emissions attributes from physical supply through tradeable certificates (a "book-and-claim" approach). Both approaches involve trade-offs.

Book-and-claim models generally involve lower costs and implementation complexity for industry, but may deliver more limited emissions reductions, particularly while demand for near-zero oil and gas remains limited. This is because buyers can purchase certificates from producers with low emissions intensity, regardless of whether the corresponding fuel is physically supplied to them. They can therefore claim to procure near-zero oil and gas without reducing the emissions intensity of their actual physical supply. This may weaken incentives for higher-intensity producers to invest in abatement, limiting overall emissions reductions. However, these concerns may diminish as book-and-claim systems expand to cover a larger share of global supply. As book-and-claim systems expand, the supply of certificates from producers already operating at low emissions intensities may eventually be insufficient to meet buyer demand. This would incentivise higher-intensity producers to reduce their emissions intensity to meet buyer demand for certificates, and in turn, drive down global emissions.

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Figure 3.2 Overview of coupled models



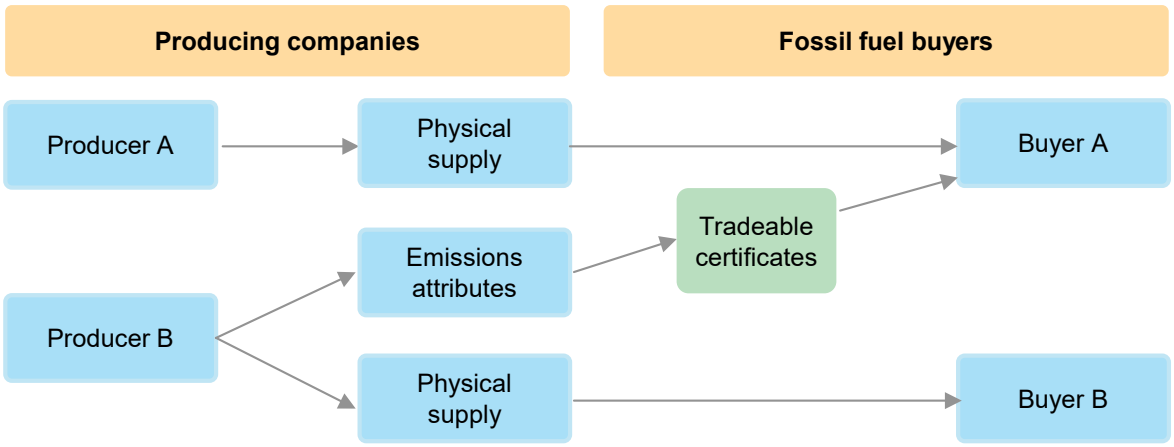
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By contrast, coupled models are more likely to deliver additional emissions reductions, particularly in the early stages of market development, as they directly incentivise higher-intensity producers to reduce emissions intensity for the oil and gas they sell. However, extensive commingling and blending along supply chains can make it costly and difficult to trace oil and gas from upstream production assets to downstream buyers. These requirements may therefore limit the practical feasibility of coupled models, increase transaction costs and constrain market participation.

Subsequent work on the NZIMM will need to examine options for disclosing emissions performance and linking verified asset-level performance to marketed volumes. These issues are best addressed once broad consensus has been secured on a common framework for defining, assessing and comparing upstream performance. Future work on disclosure and trading should seek to balance practicality, costs and real emission reductions. Rules must also be designed to ensure that producers are able to recover their investments in methane abatement technologies, strengthening incentives to reduce emissions.

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Figure 3.3 Overview of decoupled models



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Given the diversity of oil and gas procurement arrangements within and across jurisdictions, multiple approaches to disclosure and trading may be appropriate. To minimise duplication and ensure consistency, acceptable models should be aligned with existing approaches, including those recognised in the European Commission's July 2026 recommendation on compliance solutions for the European Union Methane Regulation. Producers and buyers should be consulted on the development of these approaches to ensure that they are workable and reflect the needs of market participants.

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Chapter 4. Policy options that could support a voluntary marketplace

The proposed near-zero intensity methane marketplace (NZIMM) is designed to be entirely voluntary, bringing together willing buyers and sellers around an agreed set of criteria to trade near-zero methane oil and gas. Governments can nonetheless take steps to support the marketplace and encourage participation.

This chapter outlines measures that governments may consider to develop and scale up the marketplace. Some focus on establishing the necessary market infrastructure, while others aim to boost demand for and production of near-zero methane intensity oil and gas. All are presented as options, not prerequisites, for participation. The suitability of individual measures will depend on national circumstances, including financial and institutional capacity, market and infrastructural maturity, energy security and affordability concerns, and other domestic considerations.

Table 4.1 Overview of options to develop and scale a near-zero methane oil and gas marketplace

Policy type	Description	Examples
Market development measures	Establish the necessary institutional infrastructure	• Adopting common frameworks, definitions and standards • Facilitating accreditation of verifiers
Demand-side measures	Facilitate increased demand for near-zero methane intensity oil and gas	• Transparency measures for buyers • Preferential demand-side financial incentives • Demand transparency platform • Public procurement mandates • Import standards
Supply-side measures	Facilitate increased production of near-zero methane intensity oil and gas	• Measurement, reporting and verification (MRV) frameworks for producers • Transparency measures for producers • Preferential supply-side financial incentives • Participation of national oil companies (NOCs) • Production targets for near-zero methane fuels

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Policy type	Description	Examples
Both demand and supply side	Incentivise both the demand and supply of near-zero methane intensity oil and gas	• Financial support • Leveraging carbon markets • Facilitating access to technology and capacity building • Public recognition and reputational incentives • Integrating the grading approach in domestic reporting, environmental, and false advertisement regulations

How can governments support market development?

Despite the availability of well-established, low-cost ways to lower methane emissions from upstream oil and gas operations – and the potential for near-zero methane fuels to contribute to energy security and climate goals – a voluntary marketplace for fuels differentiated by methane performance remains in its infancy.

Various barriers may discourage companies from participating voluntarily in a market for near-zero methane oil and gas. For buyers, unreliable, incomplete and non-comparable emissions data undermine confidence in claims of low- or near-zero methane intensity. For producers, weak demand signals undermine the business case for investing in methane abatement technologies, while challenges to making disclosures can discourage them from marketing near-zero methane oil and gas. Complex supply chains, uneven regulation and concerns about energy security and affordability pose further obstacles to the market's development.

Policy measures to stimulate demand for or supply of near-zero methane oil and gas, alongside the development of market infrastructure, can help to overcome initial barriers and foster market creation and uptake.

Market development measures

Governments can help establish the institutional infrastructure needed for the marketplace to function, including by aligning definitions and standards and ensuring an adequate pool of service providers, such as accredited verifiers. Governments' role can be further defined as the more technical details underpinning the market develop.

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Demand-side support

Although regulations such as the European Union Methane Regulation are stimulating demand for lower-methane fuels, and voluntary initiatives such as the Coalition for LNG Emission Abatement toward Net-zero (CLEAN) are signalling growing buyer interest in methane performance, voluntary demand for low- and near-zero methane oil and gas remains concentrated in a handful of markets, with little or no willingness among buyers to pay a premium.

Demand-side measures can help secure buyers for near-zero methane oil and gas, particularly in the early stages of market development. They can encourage buyers to choose lower-emissions fuels over conventional alternatives and help overcome the physical, contractual and logistical barriers to doing so. For example, financial incentives can help offset the costs of participation, while governments and state-owned entities can use their substantial purchasing power to create demand. Whether buying fuel to power public facilities, to replenish strategic reserves, or to supply refineries, utilities and distribution networks, state-owned entities can help demonstrate the market's viability to the private sector.

Supply-side support

Measures that reduce the costs and risks of participation and build clarity and consensus around applicable standards can give producers greater confidence in joining the marketplace and investing in methane abatement, helping to increase the supply of near-zero methane oil and gas.

Supply-side measures can encourage producers to participate, especially in the early stages, when demand is relatively weak. For example, requirements to report methane performance and financial support for measuring, reporting and verifying methane emissions can encourage producers to prioritise production of near-zero oil and gas.

Certain measures can support both the supply of and demand for near-zero methane intensity oil and gas.

Policy options

Governments have a range of policy options to help establish and scale up the marketplace. These fall into four categories, depending on whether they support market infrastructure or encourage participation on the demand side, the supply side or both. Within the demand- and supply-side categories, measures are ordered by the level of government intervention required, from least to most.

An effective policy approach will likely combine measures tailored to each country's circumstances to support the development and growth of the

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marketplace, with consideration for the impact and outcome of the measures to identify where resources should be allocated. Governments can adapt their policy mix to reflect domestic conditions, financial capacity, market maturity, institutional readiness, industrial structure and the broader considerations outlined in the IEA's Regulatory Roadmap and Toolkit.

The effectiveness of certain policy measures – such as those that attach obligations, penalties or benefits to the purchase of near-zero methane products – will depend on the maturity of the market. This includes having systems that link asset-level performance to marketed products and safeguard against double counting and misleading claims. By contrast, asset-level grades can already underpin measures such as producer disclosure requirements, methane measurement, reporting and verification (MRV) and recognition of operational performance.

Market development measures

Adopting common frameworks, definitions and standards. Governments can accelerate industry buy-in and encourage market participation by jointly supporting a common framework for the marketplace. They can also lead efforts to establish globally interoperable definitions and standards that align with international best practices and existing regulatory frameworks. Key areas for harmonisation include methane intensity calculations; system boundaries; emissions measurement and quantification; data quality assessment; criteria for independent third-party verification and mutual recognition of accreditation; reporting standards; and traceability and trading frameworks that work across jurisdictions. Governments can build on existing work, including the recommendations in this report, to establish common standards that underpin trade in fuels differentiated by methane intensity and reduce the administrative burden on market participants.

Accrediting verifiers. Governments can establish accreditation requirements and procedures for verifiers assessing the two grades under the NZIMM, in addition to developing common verification criteria. A sufficient pool of accredited verifiers would help to quickly bring the market into operation. Accreditation criteria could align with international best practice, including standards issued by the International Organization for Standardization (ISO), such as ISO 14064-3, ISO 14065 and ISO 14066, as well as existing national or regional accreditation standards. For example, Mexico has established authorisation requirements for third-party verifiers under its 2018 methane guidelines, which could provide a basis for accrediting verifiers under the NZIMM. Regulating agencies could publish accreditation procedures and timelines and maintain online lists of approved verifiers to improve transparency. The United Kingdom, for example, has published procedures for recognising verifiers under the Renewable Transport

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Fuel Obligation (RTFO) and Sustainable Aviation Fuel (SAF) mandates and maintains a list of approved verifiers. Governments may also consider instituting regional hubs of accredited verifiers and developing procedures to recognise accreditations granted in other jurisdictions, drawing on international accreditation standards like ISO/IEC 17029 or mutual recognition arrangements through bodies such as Global Accreditation Cooperation Incorporated.

Demand-side measures

Transparency measures for purchasers. Governments can encourage buyers to obtain and report data on the methane intensity of the oil and gas they purchase, including its quality and reliability. This could be voluntary, through initiatives like CLEAN, or mandatory, with requirements incorporated into existing corporate sustainability reporting or carbon accounting frameworks. Given the varying complexity of supply chains, reporting requirements could specify minimum disclosures, including the emissions sources and supply-chain segments covered; the geographic origin of production; the methods used to quantify emissions and assess data quality; the reporting period; verification status; and any material limitations or uncertainties in the data.

Demand transparency platform. Governments can help develop the market by making downstream demand for near-zero methane oil and gas more visible, drawing on experience from other emerging low-carbon commodity markets. For example, the International Civil Aviation Organization's (ICAO) public dashboard of SAF offtake agreements lists producers, contracted volumes and buyers. A similar dashboard identifying buyers of near-zero methane oil and gas could give producers a clearer signal of demand when assessing the commercial viability of investments in methane abatement. To maximise its effectiveness, the platform could take account of commercial confidentiality arrangements.

Preferential demand-side fiscal incentives. Governments can stimulate demand for near-zero methane oil and gas through financial incentives or subsidies. These could include contracts for difference or similar mechanisms that help purchasers cover the premium for lower-methane fuels. For example, in the United States, the Tennessee Natural Gas Innovation Act allows utilities to seek recovery of costs associated with procuring "responsibly sourced natural gas". In the case of SAF, Denmark has approved an aid scheme that offers airlines grants to cover part of the additional costs of SAF compared with conventional aviation fuel. Governments could also offer tax credits or deductions to buyers of near-zero methane oil and gas. The United States, for example, introduced a tax credit of USD 1.25 per gallon of qualifying SAF for importers and producers. Loan guarantees or concessional financing for buyers entering long-term offtake agreements for near-zero methane fuels could further reduce the financial risks of such contracts.

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Public fuel procurement mandates. Governments can mandate public procurement of near-zero methane intensity oil and gas. State-owned enterprises (SOEs) that act as buyers of crude oil and gas – including refiners, gas utilities, distributors and importers – could be required (or at least encouraged) to purchase a minimum amount of near-zero methane intensity oil and gas. Public procurement mandates have helped drive industrial decarbonisation. For example, Ireland requires public bodies to procure low-carbon cement and concrete for publicly supported construction projects. The Green Public Procurement Pledge similarly encourages signatory governments to commit to procuring low-emissions cement, concrete and/or steel for public construction projects starting no later than 2030. SOEs could also make advanced market commitments to buy near-zero methane oil and gas, providing suppliers with a strong demand signal. Governments could further support demand through mechanisms like the United Kingdom's Offtaker-of-Last-Resort scheme, which gives eligible renewable electricity generators access to a backstop power purchase agreement when they cannot secure one through normal commercial channels.

Import standards. Economies that import oil and gas can set a maximum methane intensity threshold for imports, with penalties for non-compliance. Governments can also require imported fuels to be subject to MRV measures that meet or exceed the minimum requirements recommended in this report. For example, the European Union's Methane Regulation requires importers to demonstrate that the fossil fuels they place on the market are subject to MRV requirements equivalent to those under the regulation and have a methane intensity below a specified maximum (which is yet to be established). Penalties apply for non-compliance. Governments considering similar measures could align them with existing regulatory requirements and the framework proposed in this report and establish practical compliance pathways to minimise the burden on market participants.

Supply-side measures

MRV frameworks for producers. Governments can encourage producers to measure, report and verify their methane emissions in line with the minimum criteria set out in this report. Compliance could be made a condition of licence awards, project approvals and production-sharing contracts. Governments could also update existing domestic MRV regulations to align with the NZIMM framework. These measures would encourage producers to quantify and verify their methane emissions while promoting harmonised standards across jurisdictions. For example, Nigeria could amend its existing monitoring and reporting obligations to require oil and gas operators to verify their reported methane emissions.

Transparency measures for producers. Governments can encourage oil and gas producers to publicly disclose specified indicators of methane emissions

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performance, such as methane intensity and data quality. These disclosures could be incorporated into existing corporate sustainability reporting laws or included in company annual reports or on company websites. Public bodies could also be empowered to publish specified methane emissions information received from regulated entities. For example, Nigeria's methane regulation requires the regulator to publish an annual report on its website detailing the volumes of gas flared and vented by producers, along with a ranking of producers by associated gas utilisation. Alberta (Canada) publishes an annual report summarising flared and vented volumes, including a ranking of operators by amount of gas flared, gas vented and total oil and gas production.

Preferential supply-side incentives. Governments can design economic incentives that favour operators with near-zero methane intensity assets and credible, verified data quality scores. These could include preferential cost-recovery or profit-sharing terms in production-sharing contracts. In countries with sustainable finance taxonomies that include fossil fuel-based power generation, such as Indonesia, a near-zero methane intensity grade could provide preferential access to sustainability-linked financial instruments. Governments could also offer loan guarantees and concessional finance to near-zero methane producers. Top grades could also be rewarded with greater flexibility in the choice of methane management tools used to comply with domestic methane regulations. For example, Canada offers an alternative compliance pathway to facilities with methane intensity below a prescribed threshold, without requiring specific compliance actions.

Participation of National Oil Companies. NOCs control close to 60% of global oil and gas reserves and accounted for half of global oil and gas production in 2025. As major global producers, their voluntary participation can be central to advancing the NZIMM. Governments can work with NOCs to develop or align their MRV systems, grade their oil and gas production in line with NZIMM methodologies and incorporate methane mitigation into their mandates. For example, in 2022, the Abu Dhabi National Oil Company (ADNOC) adopted a company-wide upstream methane intensity target of 0.15% by 2025 (calculated as the total volume of upstream methane emissions from all operated assets divided by the volume of total gas marketed). NOC participation can also encourage wider adoption across the sector, through model clauses in contracts with other operators or, more broadly, through their influence as national industry leaders. Some NOCs also have regulatory responsibilities and can leverage this role to help establish industry standards for all operators in the country.

Production targets for near-zero methane intensity fuels. Governments can set national or provincial targets to reduce the methane intensity of oil and gas production within their jurisdiction to the near-zero threshold by a specified year. The target could be based on the jurisdiction-wide average, calculated by

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comparing total methane emissions from operations with total marketed oil and gas. Interim milestones could include establishing national standards for quantifying and reporting upstream methane intensity, introducing methane mitigation regulations (including requirements for leak detection and repair (LDAR) and bans on routine flaring and venting) and eventually requiring an increasing share of production to meet the near-zero threshold. For example, Canada reports its national methane intensity in its National Inventory Document under the United Nations Framework Convention on Climate Change (UNFCCC). Governments could also require every operator in their jurisdiction to meet the near-zero threshold at the company, asset, or site level, creating a universal compliance obligation. A minimum data quality grade could be specified as a condition of compliance. For example, the US state of New Mexico is requiring operators of natural gas gathering systems to capture at least 98% of the natural gas gathered within the reporting areas by 31 December 2026.

Both demand and supply-side measures

Financial support for market participation. Governments can use economic incentives to encourage market participation. For producers, these can include fiscal support for methane abatement measures, undertaking third-party verification or making public disclosures. Support could take the form of reductions in royalties, taxes or fees for undertaking mitigation projects or obtaining third-party verification. For buyers, governments could subsidise the transaction costs of participating in the marketplace, such as costs of verifying producers' data, preparing chain-of-custody documentation, meeting corporate reporting requirements or participating in a registry. For example, the Methane Emissions Reduction Program in the United States offered grants of up to USD 850 million to offset the costs of reducing, monitoring, measuring and reporting methane emissions. Canada's Emissions Reduction Fund provides funding for oil and gas companies to deploy methane abatement technologies. Although not specific to the oil and gas sector, France's Diag Décarbon'Action programme subsidises expert support to help companies compile comprehensive GHG inventories and develop decarbonisation plans. International collaboration can also help mobilise finance to incentivise market participation, particularly in emerging and developing economies (see below).

Leveraging carbon markets. Methane abatement can be integrated into existing carbon market schemes, where appropriate, to encourage participation and mobilise additional finance. Where methane abatement is not already subject to regulatory or carbon-pricing obligations, and is not otherwise economically viable or rewarded through market instruments, carbon markets can provide an additional incentive for verified methane abatement activities that meet NZIMM standards. For example, Alberta (Canada) has developed an emissions offset protocol for eligible vent gas reduction projects, with offset generation subject to

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regulatory additionality requirements. Other platforms may innovate in different ways to efficiently integrate data on methane performance into their framework. Article 6 of the Paris Agreement could also support international financing and trading of methane mitigation outcomes. Under Article 6.2, eligible methane abatement activities associated with the production of near-zero methane intensity fuels could potentially generate internationally transferred mitigation outcomes (ITMOs), subject to Article 6 requirements. Under Article 6.4, the Paris Agreement Crediting Mechanism could support the development or adaptation of methodologies to facilitate the accounting and crediting of methane abatement measures.

Facilitating access to technology and capacity building. Governments can support producers and purchasers by developing best practices, providing tools to ease public reporting compliance, facilitating access to MRV equipment and technology, and building staff capacity. For example, the US Environmental Protection Agency provides a standardised Subpart W Reporting Form and guidance to help facilities with petroleum and natural gas systems report their GHG emissions, including methane. Norway's Offshore Norge, an industry association, has published a handbook to help operators quantify and report direct methane and non-methane volatile organic compound (VOC) emissions in line with annual regulatory requirements. The United States' CARE programme, led by Colorado State University, develops solutions and provides training to help operators reduce emissions from marginal conventional wells.

Public recognition and reputational incentives. Governments can establish public recognition programmes to acknowledge producers whose assets achieve top methane intensity and data quality grades. For example, India's Ministry of Coal annually recognises coal mines that earn a five-star rating for responsible mining practices under their Star Rating Policy. Similarly, the United Nations Environment Programme's (UNEP) Oil and Gas Methane Partnership (OGMP) 2.0 Gold Standard recognises participating oil and gas companies that bring their material assets to the highest reporting levels within the required timelines and set a company-wide methane performance target. Governments could also issue an official seal or label for operators to display in corporate reporting for assets that hold top grades at the time of reporting. Wyoming has instituted a voluntary Gold Standard Certificate for value-added products manufactured from natural gas with a methane intensity below 0.2%. Recognition could also extend to refineries and utilities that purchase top-grade fuels as a high proportion of their total purchase volume. The US Environmental Protection Agency's Green Power Partnership ranks participating organisations, including companies, governments, colleges and universities, according to their annual use of renewable electricity.

Grading approach in domestic reporting, environment and false advertisement regulations. Governments can incorporate the NZIMM grading

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approach into domestic legal frameworks governing oil and gas products. Requirements to disclose methane intensity and data quality grades could be added to existing corporate reporting obligations. Environmental standards could use the grades to assess compliance with existing requirements or inform the award of new exploration and production licenses. Governments could also incorporate the grades into legislation addressing false advertising and greenwashing. Claims that fuels have "low" or "near-zero" methane intensity could be made conditional on proving they meet specified methane intensity and data quality grades under the NZIMM framework.

International collaboration

The development of a marketplace for near-zero methane intensity oil and gas would benefit from close international collaboration between countries. Together, governments could signal a stronger commitment to the transition to near-zero methane intensity oil and gas, while laying the groundwork for policy action and helping all countries make faster progress.

Policy efforts would be more forceful and effective if governments acted together. International alignment could create positive spillovers, prompting countries and companies to cut emissions beyond the volumes destined for regulated markets. It would also reduce the risk of negative spillovers, including concerns about competitiveness and the possibility that lower-emissions exports to one jurisdiction are neutralised by higher-emission fuels consumed domestically or exported to unregulated markets. Co-ordinated action could also create stronger demand signals, increasing certainty and reducing investment risks for market participants.

Although this chapter focuses on government collaboration, market participants, financial institutions and international partners also have an important role to play in realising the full potential of international cooperation. Voluntary methane initiatives and industry-led commitments, for example, can foster peer-to-peer learning and technical knowledge-sharing among market participants, while encouraging the wider adoption of advanced measurement, reporting and verification (MRV) and mitigation practices. Financial institutions could incorporate NZIMM standards, definitions and frameworks into their financing and lending criteria, while international partners could use existing technical assistance and capacity-building programmes to support their adoption.

Beyond agreeing on common definitions and standards for the marketplace, governments could work together in several key areas:

Mobilising international finance and integrating methane performance into financial decisions. International finance can accelerate deployment of market infrastructure for trading near-zero methane oil and gas across more regions.

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Integrating methane performance into financing and investment decisions can also advance mitigation and incentivise better performance. Financial support can help emerging and developing economies access measurement technologies and data tools, deploy abatement technologies such as leak detection and repair (LDAR) and low-emissions equipment, build capacity for third-party verification bodies and establish necessary trading platforms.

Countries could provide sovereign lending to support technical assistance for partner governments, either directly or through international partners. They could also help mobilise concessional finance for methane abatement projects through multilateral development banks, development finance institutions and export credit agencies. Lending conditions could be expanded, with clear safeguards to ensure that financing delivers emissions reductions (such as through use-of-proceeds or sustainability-linked bonds and loans). In 2025, for example, the Asian Development Bank updated its Energy Policy to allow support for reducing methane leaks from existing upstream oil and gas exploration projects.

Knowledge-sharing and capacity building. International knowledge-sharing and collaboration can speed up deployment of methane abatement measures and the development of the marketplace. Countries can support technical exchanges and capacity-building programmes, both bilaterally and through international partners. These initiatives can target market participants (producers and buyers) to raise awareness of the marketplace and facilitate access to technology and service providers such as verifiers. They can also help regulators strengthen their technical and institutional capacities. Technical assistance can support the development of measurement-based inventories grounded in robust scientific data and standardised methodologies. Joint pilot projects offer another avenue for collaboration, helping demonstrate the commercial and technical feasibility of trading in near-zero methane oil and gas, generate lessons for scaling up and build confidence among market participants.

Existing platforms for knowledge-sharing and capacity-building can also be leveraged. Examples include the UNEP's International Methane Emissions Observatory (IMEO) and OGMP 2.0 initiatives; the Fossil Fuel Regulatory Programme, implemented jointly by the Climate and Clean Air Coalition and the Clean Air Task Force; the World Bank's Global Flaring and Methane Reduction Partnership; and the industry-led Oil and Gas Decarbonisation Charter.

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Chapter 5. Proposed next steps for establishing and advancing the near-zero intensity methane marketplace

The signatories to the Fossil Fuel Statement have recognised the importance of developing a near-zero intensity methane marketplace (NZIMM). Such a market would provide further incentives to oil and natural gas producers to reduce methane emissions and would help drive down emissions globally.

This report sets out a common framework for differentiating oil and gas production by methane intensity, alongside a method for assessing the reliability of fuel producers' reported emissions. However, further technical work is needed to develop and implement the framework. This includes determining how market participants could trade, retire and claim volumes of low-intensity oil and gas, how verified performance could be linked to the volumes purchased by buyers, and how emissions attributes could be reflected in commercial transactions and pricing.

The International Energy Agency (IEA) has identified four next steps for signatories to the Fossil Fuel Statement to consider and stands ready to support their implementation:

1. **Signal support for the IEA's recommendations**. This report makes nine recommendations for developing the NZIMM. Signatories can consider expressing support for them to guide current and future efforts to promote international convergence on a consistent global framework for assessing and comparing the upstream methane performance of different oil and gas sources. A common framework could improve comparability, help buyers identify lower-intensity supplies and send stronger demand signals to producers.

2. **Establish a working group to advance technical development**. Signatories could establish a technical working group (TWG) to develop the technical framework for assessing and verifying upstream methane performance at the asset level and consider the operational arrangements required. The TWG would bring together a wide range of stakeholders, including producing and consuming governments, producers, buyers, third-party service providers (such as verifiers, data providers, price reporting agencies, commodity

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exchanges and brokers), academics, international organisations and civil-society organisations. The TWG's work would be divided into two subgroups. The first subgroup would focus on finalising the framework for assessing, comparing and verifying upstream performance, including the technical specifications underpinning the methane-intensity and data-quality grades discussed in Chapter 2. The second subgroup would focus on implementation, determining how verified upstream asset-level performance is to be linked to marketed volumes and reflected in commercial transactions and pricing, as well as examining governance arrangements and technical infrastructure. An indicative agenda for the TWG is included in Annex 1. Existing regulations and initiatives for differentiating fuels by methane performance could inform this work, helping to ensure interoperability and avoid duplication. The TWG would also consider instituting pilots to assess the implementation of the market. The TWG would meet throughout 2027, with the aim of delivering an agreed framework by year's end. Participation in the TWG is envisaged to be voluntary; it does not commit countries to joining the marketplace or adopting any specific policy or regulatory measures.

3. **Support the development of the marketplace in line with national priorities and circumstances**. Although participation in the marketplace is fully voluntary, governments can support the NZIMM by establishing a credible foundation for its operation and incentivising both the supply of and demand for near-zero intensity oil and gas. Governments can choose from a range of measures suited to their national priorities and circumstances (see Chapter 4), while ensuring that the technical and operational details required to support their effective implementation are sufficiently developed.

4. **Consider approaches to progressively cover other parts of the supply chain, other fuels, and other greenhouse gases**. This report focuses on upstream methane emissions from oil and gas operations, where action is both feasible in the near term and would have the greatest impact. Signatories can consider supporting the gradual development of complementary approaches to address emissions from midstream and downstream operations, as well as coal supply chains and other greenhouse gases, including carbon dioxide.

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Annexes

Annex 1. Structure and aims of proposed Technical Working Group

This report provides a common framework for differentiating oil and gas production according to methane intensity, as well as a method for understanding the reliability of the producer's quantified emissions. Further technical work in 2027 is needed to develop and operationalise the framework, including to determine how verified upstream performance is linked to specific marketed volumes and integrated into commercial transactions.

The Technical Working Group (TWG) – which will be composed of relevant stakeholders including producers, buyers, governments, third party service providers, academia, international organisations and civil society organisations – will look to advance work on the development of a marketplace. The terms of reference for the TWG, including its leadership, membership and secretariat arrangements, will be determined at a later stage, by the end of 2026. The TWG will carry out its work throughout 2027, with the objective of delivering an agreed framework by the end of the year.

The TWG's work will be organised around two sub-groups: (1) a sub-group focused on developing a global common framework for assessing, comparing and verifying upstream performance; and (2) a sub-group focused on operationalising the marketplace. Each sub-group's areas of analysis for each sub-group are set out below. These topics are indicative and should not be considered exhaustive.

Sub-Group 1: Developing a global common framework for assessing, comparing and verifying upstream performance

Building on the IEA's recommendations and report, Sub-Group 1 will develop a common global framework for assessing and verifying the methane emissions performance of upstream oil and gas assets. This will include determining the technical details that underpin the methane intensity and data quality grades.

Methane intensity

- Determine the specific geographic and temporal boundaries along which methane intensity is reported.

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- Decide which specific upstream activities are included within the scope of the methane intensity calculation (production, processing, compression and gathering).
- Formalise the level at which methane intensity is aggregated (asset level or other).
- Finalise agreement on a common methodology for calculating production-level methane intensity, building on the IEA's recommended formula, which expresses methane intensity as energy in emitted methane over total marketed energy.
- Agree on the design and implementation details of an upstream methane emissions performance grading scheme, building on the IEA's recommended approach.

Data quality and assurance

- Develop a scoring methodology to assess the reliability of producers' quantified emissions data, balancing feasibility for producers with the need to ensure buyer confidence and trust.
- Define the specific requirements for independent third-party verification, balancing the need for credibility and trust with the availability of a sufficiently qualified pool of verifiers. This should include requirements on who can act as a verifier, how the verification should be carried out, the application level of assurance (limited or reasonable), what safeguards are necessary to protect against conflicts of interest, and whether to introduce transition timelines for developing jurisdictions.
- Explore options for ensuring interoperability between NZIMM verification requirements and existing frameworks and regulations, including the recognition of existing data and verification outcomes, and the acceptance of established verification protocols.

Sub-Group 2: Operationalising the marketplace

Building a global marketplace requires defining how market participants transact, claim and retire volumes that have been graded according to the common framework. Sub-Group 2 will examine what models can be used for trading oil and gas based on methane performance, balancing practical implementation considerations with the objective of delivering real additional emissions reductions.

Linking verified performance to marketed volumes

- Explore how verified upstream asset-level performance can be associated with specific cargoes or deliveries to buyers.

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- Examine different possible models for linking performance and emissions attributes, including coupled models (e.g. physical traceability or mass balance) and decoupled ones (e.g. book-and-claim). The assessment of potential models will take into account the extensive blending and commingling inherent in modern oil and gas supply chains, while prioritising approaches that incentivise and deliver additional emissions reductions.

- Develop arrangements for exchanging and tracking performance attributes, including rules on attribution, accounting, chain-of-custody, transfer and retirement. Safeguards will also be needed against double-counting and misleading claims.

Commercial implementation

- Explore how methane performance can be incorporated into existing commercial structures, including long-term and spot oil and gas transactions.

- Consider how contracts could allocate obligations, responsibilities, commercial value and participation costs among market participants.

Governance and technical infrastructure

- Define governance arrangements, including who is responsible for maintaining and updating the framework and who oversees verifiers.

- Develop technical infrastructure for allowing market participants to disclose and trade verified oil and gas, including appropriate platforms and registries.

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Annex 2. Understanding oil and gas markets

Oil and gas supply chains vary widely. In some markets, production is closely linked to dedicated infrastructure and long-term buyers, in others, hydrocarbons pass through multiple processing, transportation and commercial stages. Crude oil, natural gas and liquefied natural gas (LNG) may be aggregated, blended, transported through common infrastructure or traded between multiple counterparties before reaching end users.

Understanding these structures is essential to understanding how energy markets function and how physical and commercial flows interact. This annex examines the practical organisation of supply chains, transfers of ownership and market intermediation. The examples described here are illustrative rather than exhaustive, since supply-chain and commercial arrangements vary across producing regions and markets. Here, “ownership” refers primarily to commercial title to produced hydrocarbons rather than ownership of the underlying resource or infrastructure, operational control, and contractual rights to transportation, storage or processing capacity.

The distinction between oil and gas production is not always clear-cut. Many upstream fields co-produce crude oil, natural gas, condensate and natural gas liquids (NGLs), although the proportions vary considerably across assets. These products may be separated and processed at shared facilities before entering different commercial channels. Co-production also complicates methane accounting, as emissions from shared equipment and activities cannot always be attributed directly to a single hydrocarbon product.

Crude oil markets

Physical flows

Crude oil is produced from upstream fields that may also produce associated natural gas, condensate and natural gas liquids. These hydrocarbons are separated and processed at or near the production site before entering distinct physical and commercial streams. Crude oil may then be transported by pipeline, rail or other modes through gathering systems and storage facilities to refineries or export terminals, where internationally traded volumes may be loaded as cargoes onto tankers. Depending on the infrastructure and trading arrangements, the physical chain may also involve intermediate storage, blending facilities and ship-to-ship transfers.

Export grades and aggregation

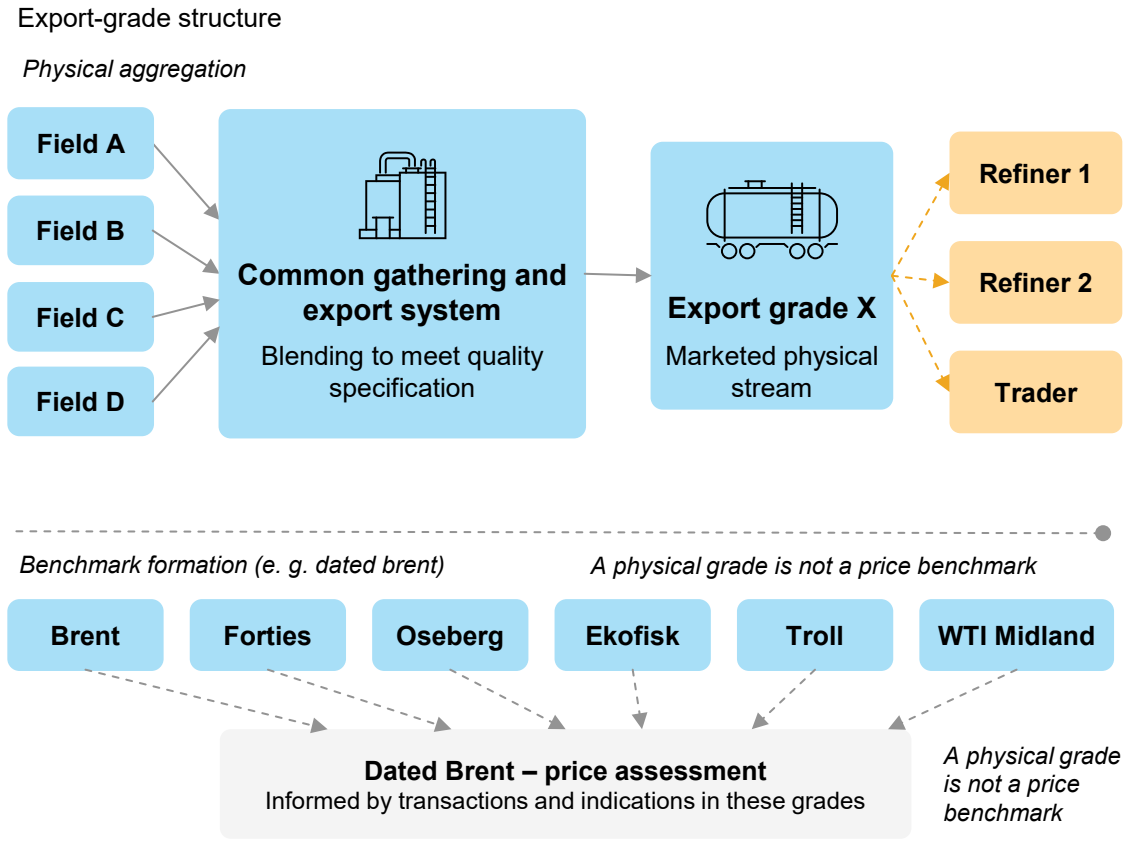
A defining feature of crude oil markets is that production is often marketed through recognised export grades rather than individual producing fields. Multiple fields

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may feed into a common gathering, pipeline or export system, and crude streams may be commingled or blended before reaching an export terminal or refinery. In shared pipeline systems, commercial volumes can be allocated among shippers or grades through metering and accounting arrangements even where the physical barrels entering the system cannot be traced individually from entry to delivery. As a result, crude oil's physical origin may differ from its commercial attribution before it enters international or domestic trade.

A physical export grade is distinct from a price benchmark. The North Sea market illustrates the difference between physical crude streams and benchmark formation. Dated Brent reflects deliverable crude streams including Brent, Forties, Oseberg, Ekofisk, Troll and WTI Midland. An export grade is a physical stream marketed to buyers, whereas a benchmark such as Dated Brent is a price assessment informed by transactions and indications for a defined set of deliverable crude streams. Other regions also market recognised export streams and blends, including CPC Blend in the Caspian region and a wide range of grades from the Middle East, Africa and Asia.

Figure A.1 Illustrative explanation of export-grade structure and benchmark formation



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Ownership and commercialisation

Commercial title to crude oil can change several times during transportation and marketing. A producer may sell directly to a refiner, but a cargo may also pass through one or more commodity traders before reaching its final destination. The sales contract determines when legal title passes, while delivery terms determine how transportation responsibilities, costs and risks are allocated between the buyer and the seller.

Commodity traders facilitate global crude trade through transportation, storage, blending, financing and market intermediation. These functions allow crude oil to be redirected across regions, delivery periods and quality requirements. Commercial title may change while cargo remains physically stationary, for example while held in storage, whereas blending may alter the physical composition of a stream or cargo before or during international marketing.

US crude oil

The United States differs from many conventional export systems because production is drawn from a large fragmented base of producers connected by extensive gathering, pipeline, storage and terminal infrastructure. Crude oil from basins such as the Permian, Eagle Ford and Bakken is aggregated through midstream systems before reaching domestic refineries or export terminals.

Hubs and coastal terminals connect inland production to global markets. The inclusion of qualifying WTI Midland cargoes supplied from approved US Gulf Coast terminals and delivered into northwestern Europe in the Dated Brent assessment framework illustrates the growing integration of US physical crude into international pricing systems. In major oil-producing basins, crude oil production may also yield associated natural gas, whose commercialisation depends on the availability of gas gathering, processing and transportation infrastructure.

Crude oil price benchmarks

Crude oil benchmarks are generally formed either through market-based assessments published by price reporting agencies, such as S&P Global Commodity Insights (Platts) or Argus, or through exchange-traded futures prices, such as ICE Brent. In physical contracts, these benchmark references are commonly used together with quality, location and timing differentials to price a wider range of crude grades.

Brent, WTI and Dubai/Oman are among the most important crude oil price benchmarks. They provide common pricing points for transactions involving a much wider range of physical grades. For the purpose of this chapter, the key point is that benchmark prices support commercial exchange across heterogeneous physical streams; detailed assessment and derivatives methodologies are outside scope.

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Pipeline gas

Physical flows and shared infrastructure

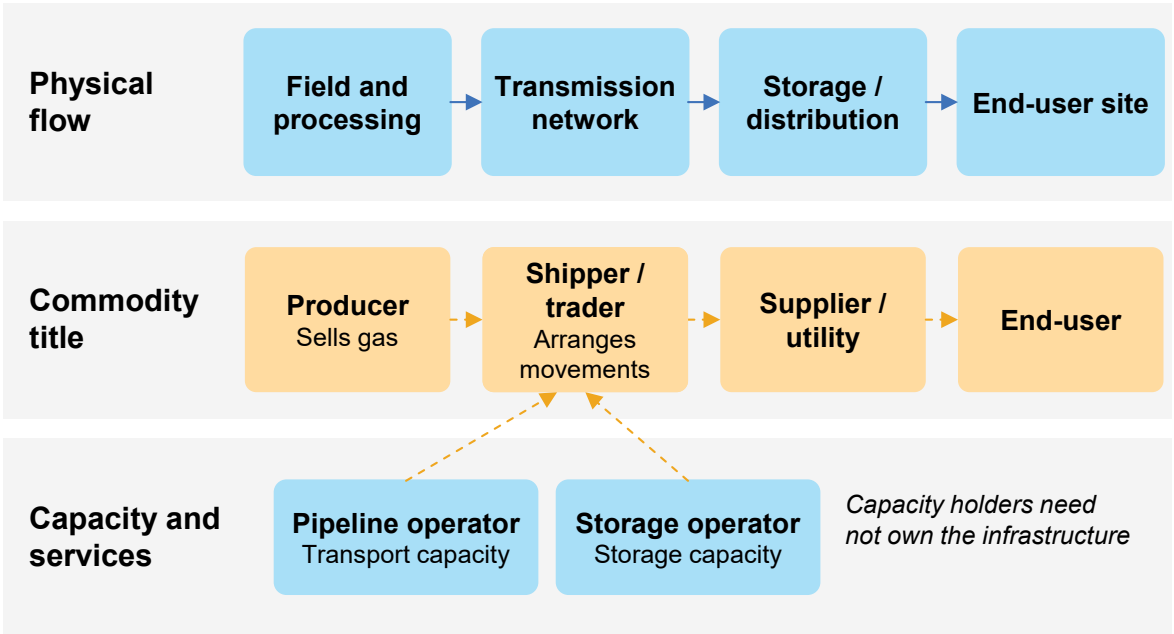
Pipeline gas markets differ from crude oil markets in the way physical qualities and commercial volumes are managed. Crude oil retains distinct quality characteristics and may be marketed as separate grades or blends, whereas natural gas is generally processed to meet pipeline specifications before entering transmission networks. Gas from multiple producing areas can then enter shared transmission systems, be stored and withdrawn, and be delivered to multiple consumers. Once gas from different sources enters a common network, the molecules become physically commingled, even though commercial volumes continue to be allocated among market participants.

Commercial structures

Gas ownership, transportation capacity and storage rights can be contracted separately. Producers sell gas, pipeline operators provide transportation services, shippers arrange movements through the network, and suppliers or utilities serve end-users. A participant may therefore have commercial rights to volumes or capacity without owning the underlying infrastructure.

This separation supports competition and market liquidity, but it also means that contractual flows and physical network flows do not necessarily coincide. Nominations, balancing arrangements and accounting systems are used to manage commercial positions across shared infrastructure.

Figure A.2 Illustrative pipeline arrangements: physical versus contractual flows



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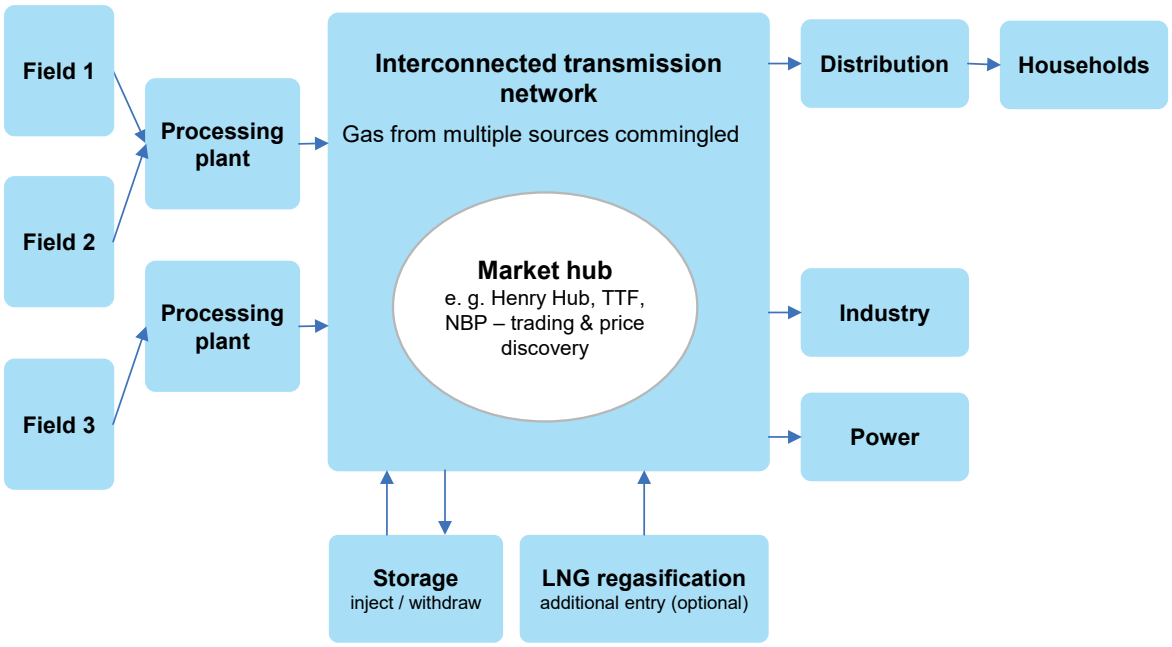
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Once gas from different sources is commingled, individual molecules can no longer be traced back to a specific producing field. Commercial volumes can still be allocated among market participants through metering, nominations and balancing accounts, however. Physical traceability should therefore be distinguished from accounting-based attribution.

Market hubs

Gas hubs provide common points for commercial exchange and price discovery across interconnected systems. Henry Hub is the principal North American reference, while the Dutch Title Transfer Facility (TTF) is the leading continental European benchmark, and the National Balancing Pont (NBP) remains a key benchmark in the United Kingdom. These hubs facilitate transactions across broad market areas, even though individual molecules are commingled within the underlying network.

Figure A.3 Market hubs



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Liquefied natural gas markets

Physical flows

LNG enables natural gas to be transported internationally beyond pipeline networks. Gas is processed and liquefied at an export facility, loaded onto a specialised vessel, shipped to an importing market and regasified before entering

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a downstream gas network or being supplied directly to a large customer. LNG therefore combines the network-based characteristics of pipeline gas markets with the cargo-based logistics of maritime commodity trade.

Once loaded onto a vessel, an LNG cargo is generally more physically discrete than gas moving through a pipeline network. However, this does not necessarily mean that the cargo can be attributed to a single upstream producing asset. Feed gas may originate from multiple fields or an interconnected pipeline system, and volumes may be aggregated before or during liquefaction.

Traditional LNG projects

Historically, most LNG projects were developed as integrated or project-linked systems connecting dedicated gas resources, liquefaction facilities and long-term buyers, often through common project sponsors or affiliated entities. Long-term sales and purchase agreements provided revenue visibility for capital-intensive project development and security of supply for importing utilities.

Common stream marketing

Under common stream marketing, LNG produced by the project is sold collectively through a project marketing entity. Revenues are allocated among project participants according to the applicable arrangements, and the buyer contracts with the common seller rather than with each individual equity participant. LNG is marketed as a common project stream, even where ownership interests and production entitlements are held separately by the project participants. Such arrangements allow participants to share common infrastructure while commercialising project output collectively.

Equity lifting

Under equity lifting, project participants receive LNG entitlements in proportion to their interests or according to agreed allocation arrangements, and market their volumes independently. Although production and liquefaction facilities are shared, participants may pursue different customers, destinations and sales strategies. As a result, cargoes from the same project may be marketed by different entities. This structure allows participants to share production and liquefaction infrastructure while retaining greater independence over the commercialisation of their respective entitlements.

Evolution of LNG commercialisation

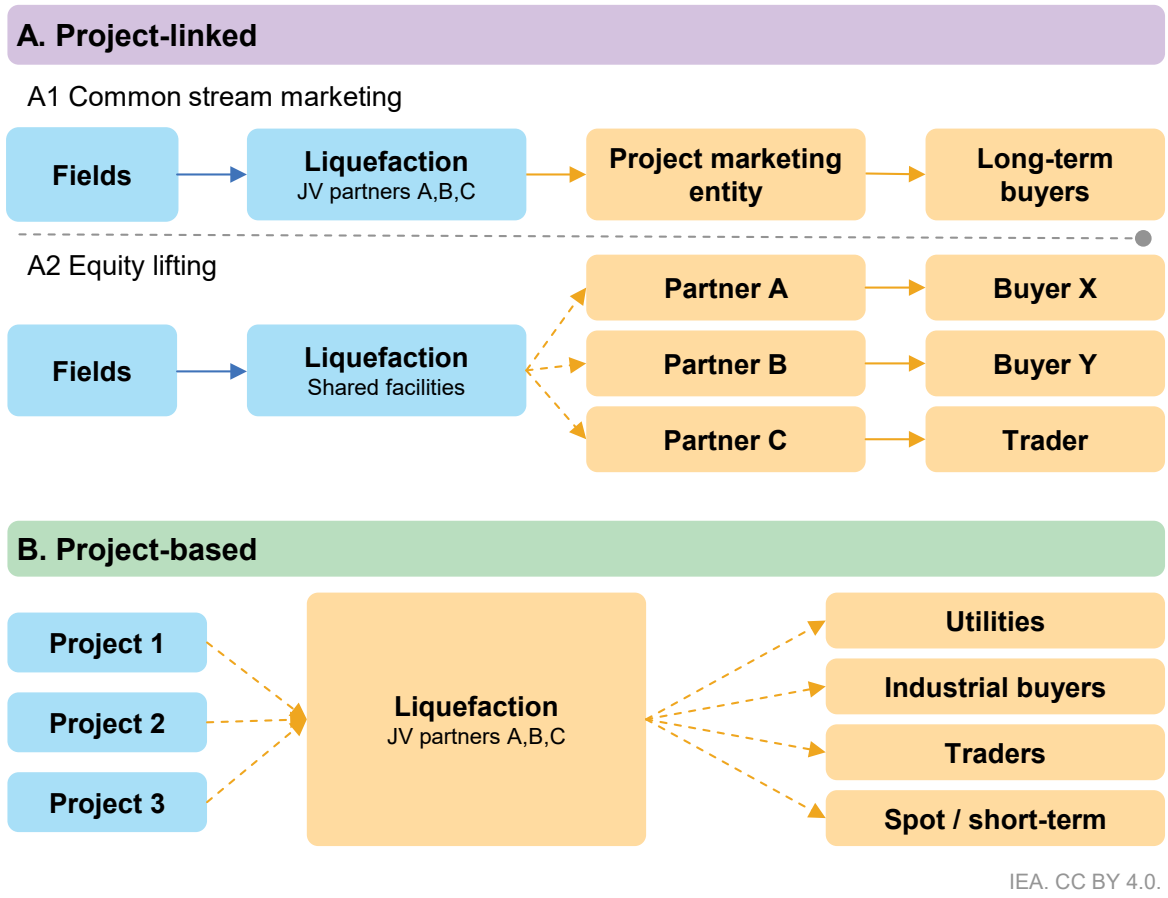
Long-term contracts remain central to LNG markets, but commercial arrangements have become more flexible. Traditional long-term supply

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arrangements between projects and utilities now coexist with portfolio-based supply, spot and short-term sales, flexible destinations and optimisation across multiple sources and customers.

Portfolio suppliers may source LNG from several projects and use these supplies to serve utilities, industrial buyers and other traders across different markets. Some portfolio players also hold downstream demand or infrastructure positions, while others focus on aggregation, shipping, risk management and market access. Depending on the contract terms, supply obligations may be met using LNG from different projects or cargoes. This creates a greater separation between the source of production, the commercial seller and the cargo's ultimate destination.

Figure A.4 Simplified comparison of project-linked structure and project-based structure



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Commercial models prevalent in US LNG projects

In the United States, the LNG sector does not follow a single commercial model. Projects differ in who procures feed gas, who holds title to gas and LNG at each stage, who produce the LNG, how liquefaction revenues are earned, and how commissioning or other uncontracted volumes are marketed.

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Tolling structures

Under a tolling structure, capacity holders reserve liquefaction capacity and typically remain responsible for procuring feed gas and marketing the resulting LNG. They typically retain commercial title to both the feed gas and the resulting LNG, while the liquefaction facility provides a conversion service rather than buying and reselling the commodity. Freeport LNG is an example of this model.

Long-term sales and purchase agreements

Other projects sell LNG directly under long-term sales and purchase agreements (SPAs). Under these arrangements, the project company or an affiliated marketing entity may procure feed gas, sell LNG and earn revenues through a combination of fixed charges and commodity-linked payments. Sales may be agreed on a free-on-board (FOB) or delivered basis, depending on how shipping and delivery responsibilities are allocated.

Some US exporters combine liquefaction with broader gas procurement, shipping and marketing activities. Cheniere Energy, for example, operates across the LNG value chain, including gas procurement and transportation, liquefaction, vessel chartering and delivery. A single corporate group may therefore combine the roles of liquefaction service provider, LNG seller and portfolio marketer, with the allocation of these roles varying across projects and contracts.

Implications for a methane marketplace

These market structures mean that verified methane performance at a producing field cannot always be directly linked to the oil, pipeline gas or LNG ultimately purchased by a buyer. The challenge varies by commodity: crude oil may be aggregated into export grades and blended; pipeline gas is commingled in shared networks; and LNG cargoes, while physically discrete, may draw on multiple upstream sources or portfolio supplies. Implementing the NZIMM will therefore require attribution and accounting arrangements that distinguish physical traceability from commercial attribution and accommodate differences in how crude oil, pipeline gas and LNG are produced, marketed and traded.

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Abbreviations and acronyms

ADNOC	Abu Dhabi National Oil Company
AI	Artificial intelligence
CCAC	Climate and Clean Air Coalition
CIRIS	Certificate Inter-Regional Import System
CLEAN	Coalition for LNG Emission Abatement Toward Net-Zero
COP28 / COP30	28th / 30th United Nations climate change conference
CRFD	Climate-Related Financial Disclosures
CSAM	Central and South America
EDF	Environmental Defense Fund
EIA	United States Energy Information Administration
EO	Equitable Origin
EPA	United States Environmental Protection Agency
EU	European Union
EUMR	European Union Methane Regulation
FOB	Free on board
GEF / GEFs	Generic emission factor / factors
GHG	Greenhouse gas
GWP	Global warming potential
HHV	Higher heating value; also called gross calorific value
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
IMEO	International Methane Emissions Observatory
IOGP	International Association of Oil and Gas Producers
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITMOs	Internationally transferred mitigation outcomes
LDAR	Leak detection and repair
LHV	Lower heating value; also called net calorific value
LNG	Liquefied natural gas
MARCOGAZ	Technical Association of the European Gas Industry
MiQ	Methane Intelligence Quotient
MMRV	Measurement, monitoring, reporting and verification
MMRV Working Group	International Working Group to Establish a Greenhouse Gas Supply Chain Emissions Measurement, Monitoring, Reporting and Verification Framework
MRV	Measurement, reporting and verification

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NBP	National Balancing Pont
NDCs	Nationally Determined Contributions
NGLs	Natural gas liquids
NGSI	Natural Gas Sustainability Initiative
NOC / NOCs	National oil company / companies
NZIMM	Near-zero intensity methane marketplace
OGCI	Oil and Gas Climate Initiative
OGDC	Oil and Gas Decarbonisation Charter
OGMP 2.0	Oil and Gas Methane Partnership 2.0
ONE Future	Our Nation's Energy Future Coalition
P2P companies	Companies covered in the Turning Pledges into Progress report
RMI	Rocky Mountain Institute
RTFO	Renewable Transport Fuel Obligation
SAF	Sustainable aviation fuel
SOEs	State-owned enterprises
SPAs	Sales and purchase agreements
TTF	Title Transfer Facility
TWG	Technical Working Group
UK	United Kingdom
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US / U.S.	United States
VOC	Volatile organic compound

Units, currency and chemical symbols

%	Per cent
°C	Degrees Celsius
bcm	Billion cubic metres
boe	Barrel of oil equivalent
CH_4	Methane
CO_2	Carbon dioxide
GJ	Gigajoule
kg	Kilogram
kg CH_4/boe	Kilograms of methane per barrel of oil equivalent
kg CH_4/GJ	Kilograms of methane per gigajoule of marketed energy
m³	Cubic metre
mb/d	Million barrels per day

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mcm	Million cubic metres
MJ	Megajoule
MJ/kg	Megajoules per kilogram
MJ/m³	Megajoules per cubic metre
Mmbtu	Million British thermal units; notation should be checked for consistency
Mt	Million tonnes
USD	United States dollars

See the IEA glossary for a further explanation of many of the terms used in this report.

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