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Methane and GHG Emissions Management Issues in LNG

- Policy, markets, and companies - September 2026

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Introduction

The management of methane and greenhouse gas (GHG) emissions continues to evolve from a largely voluntary sustainability initiative into a core component of energy policy, market access, and commercial decision-making across the global gas and LNG industries.

Recent developments indicate a growing emphasis on the measurement, reporting, and verification of emissions throughout the LNG value chain. Governments, international organisations, and industry participants are increasingly seeking to improve the quality and comparability of emissions data, while also exploring mechanisms to translate emissions performance into market signals. As regulatory frameworks mature, attention is shifting from broad policy commitments towards practical implementation, including monitoring methodologies, compliance systems, certification schemes, and reporting requirements.

At the same time, discussions on methane mitigation are becoming more closely linked with wider decarbonisation strategies. Alongside efforts to reduce methane emissions directly, the industry is examining pathways such as electrification, carbon capture and storage (CCS), low-carbon fuels, hydrogen, and synthetic methane. These initiatives reflect the growing expectation that future energy systems will require both reliable gas supplies and credible emissions reduction measures.

The September 2026 edition reviews recent international developments in methane and GHG emissions management, including new policy initiatives, analytical frameworks, technological cooperation, and corporate actions. It also examines emerging approaches to emissions transparency, attribute certification, and compliance under evolving regulatory regimes. In addition, the report highlights developments related to hydrogen and e-methane, as well as recent research that is improving understanding of methane emissions and informing future mitigation strategies.

Together, these developments illustrate how emissions performance is increasingly becoming an integral element of competitiveness, market access, and long-term investment decisions across the global LNG sector.

1 Global Developments

Methane and GHG emissions management continues to gain prominence across energy markets worldwide. Policymakers, industry participants and research organisations are placing increasing emphasis on emissions transparency, measurement accuracy and practical mitigation pathways.

1.1 Initiatives by International Organisations

Section 1.1 focuses on the efforts of international organizations to improve the monitoring and reduction of methane emissions. International organisations are playing a growing role in developing common frameworks, metrics and analytical tools to improve the understanding and management of methane and GHG emissions. Recent initiatives highlight efforts to enhance comparability, transparency and international cooperation.

IMEO (UNEP's (United Nations Environment Programme) International Methane Emissions Observatory) held a webinar on 15 September 2026 to introduce its planned MEI (Methane Emissions Index) concept and explore its potential applications¹. The MEI is to help translate empirical methane data into a clear, comparable signal.

The report from IEA (International Energy Agency) on 10 September 2026 "Assessing Emissions from LNG Supply and Abatement Options" evaluates the greenhouse gas emissions generated across the entire LNG supply chain². Beyond tracking data, the report identifies abatement strategies such as methane reduction, electrification, and carbon capture technology to mitigate these emissions.

1.2 Initiatives by Companies, Countries and Organisations to Manage and Reduce Emissions

Section 1.2 provides an overview of the efforts undertaken by governments, energy companies, and other organizations to manage methane and greenhouse gas (GHG) emissions. Governments, companies and industry organisations are expanding efforts to monitor, reduce and manage emissions across the energy sector. Recent developments range from technological cooperation and monitoring infrastructure to regulatory implementation and carbon management projects.

JOGMEC (Japan Organization for Metals and Energy Security), Malaysia's PETRONAS (Petroliam Nasional Berhad), JGC Corporation, and TotalEnergies signed an MoC (Memorandum of Collaboration) on 13 September 2026 for the establishment

¹ <https://www.unep.org/events/webinar/introducing-imeos-methane-emissions-index-mei>

² <https://www.iea.org/reports/assessing-emissions-from-lng-supply-and-abatement-options>

and operation of the SEA METEC (Southeast Asia Methane Emissions Technology Evaluation Centre)³. The MoC sets out a framework for the four parties to collaborate on the testing and evaluation of methane emissions measurement and monitoring technologies, capacity building, research and development, and knowledge sharing, with the aim of strengthening methane emissions management capabilities in Southeast Asia.

JOGMEC (Japan Organization for Metals and Energy Security) and the World Bank Global Flaring and Methane Reduction (GFMR) Partnership hosted a leadership roundtable at Gastech 2026 Bangkok entitled "Building Cleaner LNG Supply Chains for Asia: From Buyer Signals to Producer Action" on 13 September 2026⁴. The roundtable brought together leaders from governments, national oil companies, LNG buyers, and public-finance partners to identify practical pathways for methane-ready LNG supply chains, with a particular focus on the Asia-Pacific region.

European energy industry organizations led by Eurogas issued on 31 August 2026 a joint reaction highlighting challenges regarding the implementation of the EU Methane Regulation⁵. According to the statement, the current compliance framework is incomplete, leaving importers facing legal and financial risks due to unavailable verification protocols and accreditation standards. The statement expresses concern that the European Commission's non-binding recommendations fail to address these structural gaps or prevent the fragmentation of the single market. Consequently, the industry is calling for a three-year postponement of specific import obligations to allow for the development of necessary tools and global compliance pathways. The statement emphasizes that without binding legal certainty, the transition to the new methane reporting standards could undermine supply diversification and market stability.

Russia's PAO NOVATEK announced⁶ on 18 September 2026 that the company in collaboration with the Russian Ministry of Science and Higher Education, the Arctic Research Center, and the University of Tyumen had launched the northernmost greenhouse gas monitoring station in the national carbon measurement supersites network. The facility is located within a license area operated by NOVATEK-Yurkharovneftegas in the Nadym District of the Yamal-Nenets Autonomous Area. The new station will complement the Seven Larches carbon supersite in the region's forest tundra. The facility's core feature is its focus on permafrost. Equipped with measurement tools and a temperature measurement well, the station will support the assessment of the tundra ecosystems' carbon sink potential.

³ https://www.jogmec.go.jp/english/news/release/release_00459.html

⁴ https://www.jogmec.go.jp/english/news/release/release_00458.html

⁵ <https://www.eurogas.org/resource/joint-industry-reaction-and-recommendations-eu-methane-regulation-dg-ener-recommendations/>

⁶ https://www.novatek.ru/en/press/releases/index.php?id_4=7882

The US Environmental Protection Agency (EPA) announced⁷ on 14 September 2026 that it had suspended requirements that power plants reduce carbon dioxide emissions. The EPA is also proposing to rescind all greenhouse gas emission regulations on power plants. EDF (Environmental Defense Fund), NRDC (Natural Resources Defense Council), American Lung Association, American Public Health Association, Clean Air Council, and Clean Wisconsin (represented by Clean Air Task Force) sued to stop the Environmental Protection Agency's (EPA) repeal of standards for power plant carbon pollution at the U.S. Court of Appeals for the D.C. Circuit on 17 September⁸.

Australia's Woodside Energy progressed proposed CCS opportunities in Australia and the Asia-Pacific, including the operated Angel CCS and non-operated Bonaparte CCS, according to the company's first half 2026 report on 25 August⁹. In H1 2026, the proposed Angel CCS Project completed engineering studies as part of pre-FEED and commenced domestic and international engagement with potential customers for CCS services.

Norway's Equinor and Germany's Uniper announced on 24 August 2026 that they had signed a 15-year agreement for supplies of natural gas to Germany¹⁰. Equinor will deliver more than 30 TWh (2.8 bcm) of natural gas per year to Uniper. Supplies under the new agreement will be from 1 January 2027 to 31 December 2041 with the gas delivered at Trading Hub Europe, the German gas market area. Equinor and Uniper have also signed a non-binding LOI (letter of intent) to explore possible sales from Equinor to Uniper of sustainability-related attributes linked to supplies under the new gas sales agreement. These attributes refer to documented data on the origin of the gas and its greenhouse gas intensity and other sustainability characteristics of Equinor's gas production, which is third-party verified and made available through the Attributes digital platform.

The Nigerian government announced on 21 August 2026 that it was advancing policies to reduce methane emissions from dumpsites and promote sustainable waste management¹¹. Under the Multi-Solving Action for Methane Reduction in Nigeria (MAMRN) project, the National Council on Climate Change (NCCC) and other stakeholders are supporting the development of a national action plan for methane reduction in the waste sector, while strengthening related policies, stakeholder capacity and sustainable waste management practices. The government also aims to link methane

⁷ <https://www.epa.gov/newsreleases/epa-finalizes-repeal-2024-power-plant-regulations-delivering-300-billion-savings>

⁸ <https://www.edf.org/media/epa-sued-over-repeal-power-plant-carbon-reduction-rules>

⁹ <https://www.woodside.com/docs/default-source/investor-documents/quarterly-and-half-yearly-pdfs-and-data-tables/2026/half-year-2026-report.pdf>

¹⁰ <https://www.equinor.com/news/20260824-equinor-and-uniper-sign-15-year-gas-sales-agreement>

¹¹ <https://nannews.ng/fg-implementing-policies-to-reduce-methane-emissions-from-waste/>

mitigation with its "Waste-to-Wealth" initiative, promoting resource recovery and the circular economy.

1.3 Developments Related to Hydrogen

Section 1.3 provides an overview of key policies and investment trends related to hydrogen. Recent developments focus on advancing production, transport and supply-chain infrastructure while exploring its interaction with existing natural gas and LNG systems.

The H2Perth Project is a proposal to develop Australia's first commercial-scale liquid hydrogen production and export facility, according to Woodside Energy's first half report on 25 August 2026¹². In May 2026, the Environmental Protection Agency approved Woodside's application to amend the proposal for the project from its previous concept of a liquified hydrogen and ammonia production facility to a liquefied hydrogen only facility.

Kawasaki Heavy Industries announced on 25 August 2026 that it would begin construction of a hydrogen production facility in the Kawasaki coastal area using steam methane reforming (SMR)¹³. The facility is scheduled for completion around spring 2029 and will produce 18 tonnes per day of high-purity hydrogen using city gas as feedstock. The hydrogen will be used for the "Commercial-Scale Demonstration of a Liquefied Hydrogen Supply Chain" being carried out by Japan Suiso Energy (JSE) under NEDO's Green Innovation Fund programme, with plans to supply it to the Kawasaki LH₂ Terminal via a high-pressure hydrogen pipeline. Through the facility, Kawasaki Heavy Industries aims to contribute to expanding Japan's domestic hydrogen supply infrastructure and accelerating the development of the hydrogen industry.

According to media reports in late September 2026, Abu Dhabi's Masdar (Abu Dhabi Future Energy Company) has pulled out of the joint development of a 140-MW green hydrogen plant in Austria with OMV AG. OMV confirmed that Masdar's withdrawal would not affect the scope and timeline of the project, which was recently funded through a €123-million debt facility from Austria's federal development bank Austria Wirtschaftsservice GmbH (aws). The European Investment Bank (EIB) is lending €450 million. The electrolyser is being installed in Bruck an der Leitha. Set to become one of Europe's top five by capacity, it is designed to produce up to 23,000 tonnes per year of green hydrogen using renewable energy.

¹² <https://www.woodside.com/docs/default-source/investor-documents/quarterly-and-half-yearly-pdfs-and-data-tables/2026/half-year-2026-report.pdf>

¹³ https://www.khi.co.jp/pressrelease/detail/20260825_1.html

1.4 Studies by Different Organizations on Methane Emissions

Section 1.4 introduces recent scientific and technical research. New studies are improving understanding of methane emissions sources, mitigation opportunities and compliance mechanisms. These analyses provide valuable insights into both the physical measurement of emissions and the evolving policy and commercial frameworks governing methane management.

The UCLA STOP Methane Project report¹⁴, released on 14 September 2026, utilizes advanced satellite technology to identify and rank the most significant methane emission sources within major United States natural gas basins. By analysing data from the Tanager-1 satellite, researchers pinpointed high-emitting sites in the Permian, Appalachian, and Haynesville regions, which are critical to the global export of liquefied natural gas. The study highlights specific corporate operators responsible for these "super-emitters" and introduces new data regarding the public health risks caused by associated hazardous air pollutants. While the findings demonstrate that some companies have successfully implemented mitigation strategies, the report emphasizes that persistent leaks remain a major environmental challenge. Ultimately, this research advocates for increased regulatory transparency and better monitoring to reduce the significant greenhouse gas footprint of the American energy supply chain.

The OIES paper "Framework on Implementing a Compliance Solution under the EU Methane Emissions Regulation" on 8 September 2026 proposes a comprehensive framework for establishing voluntary compliance solutions to assist natural gas importers in meeting Monitoring, Reporting, and Verification (MRV) import obligations under the EU Methane Emissions Regulation¹⁵. To overcome the operational challenges of physical molecule tracing in complex global supply chains, the authors outline two distinct chain-of-custody models recommended by the European Commission: Certification, where environmental attributes are decoupled from physical gas, and Trace-and-Claim, where attributes are contractually bundled. The framework strongly advocates for robust structural governance, strict commercial separation, and progressive alignment with international ISO standards to bolster global marketplace credibility and stakeholder trust. Additionally, it analyses the UNEP-hosted IMEO/OGMP2.0 as a potential compliance solution provider.

¹⁴ <https://law.ucla.edu/news/methane-made-america>

¹⁵ <https://www.oxfordenergy.org/publications/a-framework-on-implementing-a-compliance-solution-under-the-eu-methane-emissions-regulation/>

2 Developments in Japan

Section 2 provides an overview of trends regarding methane emission management and GHG reduction initiatives involving Japanese companies and stakeholders. Recent activities demonstrate progress in areas including e-methane production, carbon utilisation, emissions certification, and smart energy systems, reflecting a broader effort to integrate climate objectives with energy system reliability.

The Live Oak consortium announced on 27 August 2026 the launch of FEED (Front-End Engineering Design) activities for the Live Oak project, a large-scale electric natural gas (e-NG, also known as e-methane) production facility under development in Nebraska, United States¹⁶. The consortium comprises TotalEnergies and TES (each holding a 33.35% stake in Live Oak), alongside Osaka Gas, Toho Gas and ITOCHU (33.3% combined). U.S.-based KBR and Spain's Técnicas Reunidas will carry out parallel FEED studies, after which one of the two FEED concepts will be selected for execution. The project aims to complete FEED and start execution in 2027, with potential beginning of commercial operations by 2030. Located in Norfolk, Nebraska, the project is expected to produce e-NG, a synthetic gas made by combining renewable hydrogen produced through electrolysis with CO₂ captured from bioethanol plants. Once operational, Live Oak aims to supply low-carbon gas to customers in Japan, leveraging existing U.S. natural gas and LNG infrastructure for exports. Osaka Gas and Toho Gas will serve as the project's primary offtakers. This project will help these Japanese gas utilities achieve their goal of injecting 1% carbon-neutral gas, including e-NG, into the gas grid by 2030. The project targets a capacity of 250 MW of electrolysis and 75,000 tonnes per year of methanation, with plans to export e-NG to Japan.

Tokyo Gas Co., Ltd. announced¹⁷ on 16 September 2026 that the project with Takuma Co., Ltd. "Feasibility Study on CO₂ Supply Chain Construction for e-methane Production and City Gas Pipeline Injection Using CO₂ Captured from Ota Waste Incineration Plant Flue Gas and Hydrogen from Keihinjima Green Hydrogen Production Plant as Feedstocks" was selected by the Tokyo Metropolitan Government under its "FY2026 Feasibility Study for CO₂ Supply Chain Construction". The companies aim to achieve commercialisation from 2030 onwards.

Tokyo Gas Engineering Solutions (TGES) launched on 8 September 2026 the Yaesu-Nihonbashi Smart Energy Network, a sophisticated project that connects a newly constructed heating and cooling plant with an existing facility¹⁸. By integrating these two plants, the system utilizes advanced turbo chillers and gas cogeneration to improve

¹⁶ https://www.osakagas.co.jp/en/whatsnew/_icsFiles/afieldfile/2026/08/26/260828.pdf

¹⁷ <https://www.tokyo-gas.co.jp/news/press/20260916-02.html>

¹⁸ <https://www.tokyogas-es.co.jp/information/press/2026/20260908.html>

thermal manufacturing efficiency by approximately 15%. The infrastructure is designed to enhance urban resilience, providing back-up energy and maintaining heat supply even during major power outages. Operations are managed through artificial intelligence, which predicts energy loads and automates control to ensure optimal performance. This initiative serves as a scalable model for regional redevelopment, with future plans to incorporate a third plant into the network to further stabilize the area's energy grid.

NARO (National Agriculture and Food Research Organization, Japan), Hiroshima University, Gunma Prefecture and Tohoku University announced on 28 July 2026 that they had developed a simple formula for estimating enteric methane emissions from dairy cows using milk composition data, including milk fatty acid composition, which are widely collected from dairy farms across Japan¹⁹. The method is expected to enable methane emissions from large numbers of dairy cows to be assessed and contribute to the genetic improvement of dairy cattle with lower methane emissions.

BIPROGY Inc. announced on 27 August 2026 that it had been awarded a demonstration project by the Agency for Natural Resources and Energy (ANRE) under Japan's Ministry of Economy, Trade and Industry (METI), as part of the FY2026 Environmental Value Certification Scheme Development Programme for synthetic methane and biogas²⁰. The demonstration will run from August 2026 to March 2027. The project will examine the operational framework and feasibility of a "Clean Fuel Certificate Scheme", under which the environmental value of synthetic methane and biogas would be certified, issued as certificates and traded.

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¹⁹ https://www.naro.go.jp/publicity_report/press/laboratory/nilgs/176906.html

²⁰ https://www.biprogy.com/pdf/news/nr_260827.pdf