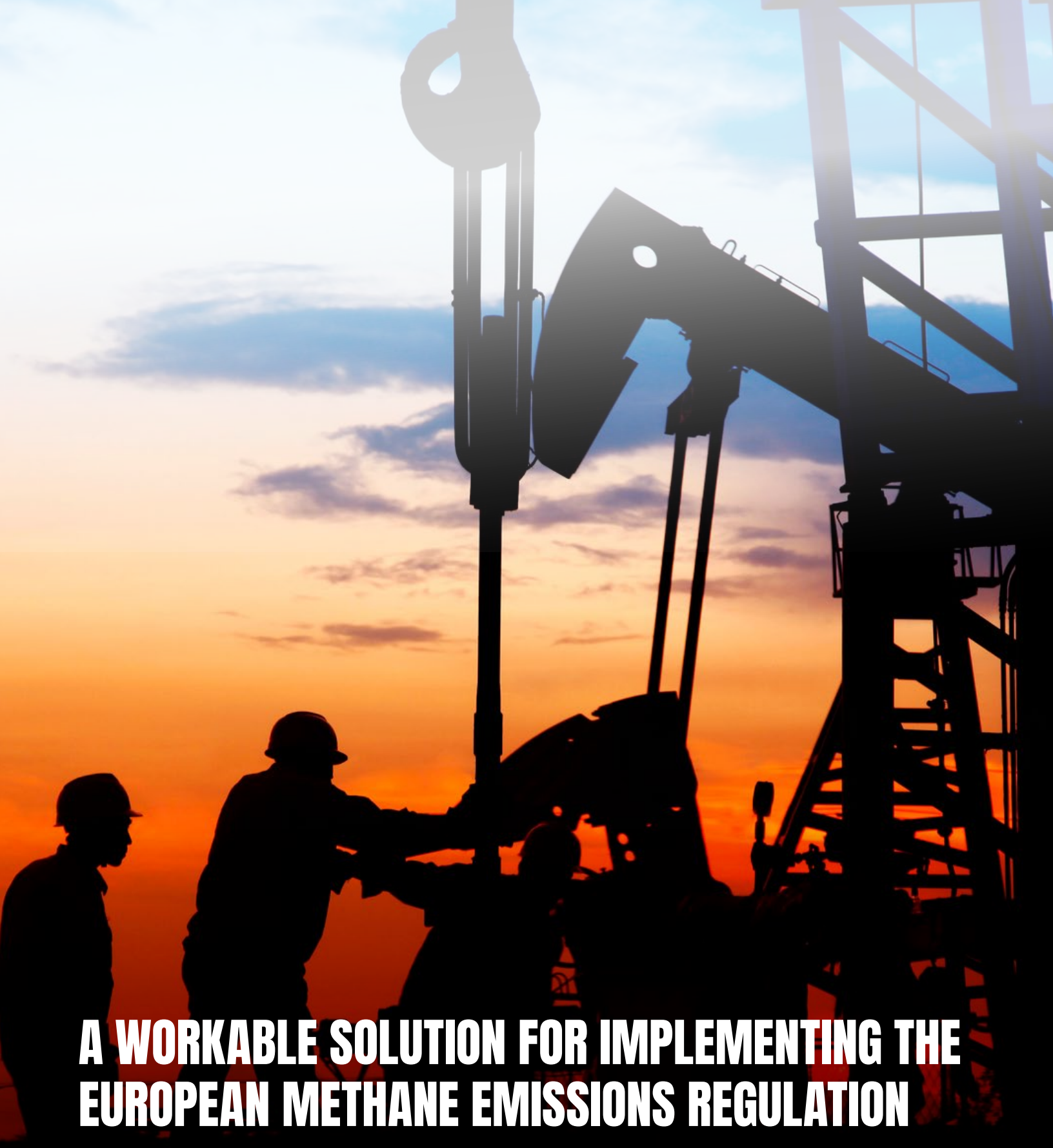

A WORKABLE SOLUTION FOR IMPLEMENTING THE EUROPEAN METHANE EMISSIONS REGULATION

Discussion Draft: Attributing Methane Performance Through Complex Natural Gas Supply Chains

Environmental Defense Fund

RMI

CATF CLEAN AIR TASK FORCE

Background

While an ultimate objective of the European Union Methane Emissions Regulation (MER) is the creation and implementation of a methane performance or intensity standard for oil and natural gas imported for use within the EU, the regulation creates a phased approach with increasing reporting requirements focused on the production segment of the imported oil and gas.

Compliance Date	Requirement
May 5, 2025	Report to Competent Authorities the location of producer, route of gas, and any monitoring, reporting and verification (MRV) and abatement at production site of imported oil and gas.
January 1, 2027	Demonstrate and report to Competent Authorities that all oil and gas imported (deliveries as of 2027) under contracts since August 2024 is subject to MRV equivalent to that required of domestic operations (MRV standards set forth in Article 12 or OGMP 2.0 L5).
August 5, 2028	Report to Competent Authorities the production segment methane intensity of oil and gas imported (deliveries as of 2028) under contracts executed since August 2024 (with the methane intensity calculation methodology to be determined by the European Commission by August 2027).
August 5, 2030	Report to Competent Authorities that the production segment methane intensity of oil and gas imported under contracts executed from August 2030 is below the maximum threshold set by the Commission (with the methane intensity threshold to be set by August 2029).

Each of these requirements falls on importers to gather and report information about production segment characteristics of imported oil and gas that, currently, is not routinely communicated across supply chains. The regulation does not prescribe a particular mechanism for providing evidence of compliance. This evidence must include demonstrating the origin, transportation pathway, and other environmental attributes of imported oil and gas. The European Commission leaves the burden of providing evidence to industry and other stakeholders, including the development of necessary systems to gather and transmit such evidence. Member States and Competent Authorities will determine whether the evidence provided, and mechanisms used, are sufficient. While the MER's implementation includes the important work of setting robust MRV compliance standards, a methane intensity methodology, and other requirements, this discussion draft focuses on the question of determining origin or provenance through complex supply chains.

Discerning environmental characteristics of commodities through supply chains is neither novel nor prohibitively complex. But tracing the attributes of oil and gas across value chains can vary significantly in difficulty, with complex supply chains presenting unique challenges. As discussed below, the best solution balances accuracy and environmental integrity with practicality and minimization of cost, disruption to existing market function, and the need for extraterritorial regulation. This piece focuses on the natural gas supply chain, but similar principles should apply to crude oil as well.

The Challenge

For importers purchasing gas from companies or countries with unitary supply chains and little commingling of gas from diverse operators or fields (such as Qatar), production segment emissions and monitoring, reporting and verification (MRV) information can more easily be discerned and reported. However, for importers purchasing gas from more complex oil and gas supply chains (such as the US with many producers and producing fields; physical and commercial comingling of volumes along supply chains, at trading hubs and on energy exchanges; and gas volumes being transacted multiple times), determining the attributes of imported gas is a more complicated task.

Below, we lay out a set of principles that we believe should guide any system for determining the attributes of EU gas supplies, consistent with the intent of the EU Methane Emissions Regulation (MER). We briefly discuss three approaches being advanced by stakeholders and then recommend a phased approach that best comports with the following principles.

As used below, "system" refers to any approaches, methods, or frameworks used to demonstrate compliance with the MER's import requirements, including gas provenance, MRV, and methane intensity reporting requirements. The discussion that follows the principles below will focus on how systems address gas provenance.

Principles for Methane Emissions Accounting Framework:

1. The system must credibly attribute emissions performance data at the producer level to EU gas supplies, providing evidence that volumes meet or exceed an industry-leading methane intensity threshold (e.g., 0.2% or lower) and enable price signals that will incentivize better performance globally.
2. The system must minimize consumer price impacts and protect security of supply by minimizing transaction costs and complexity and maintaining adequate market liquidity and flexibility.
3. The system should build on – and should be easily adapted to – existing approaches to global commodity trading, especially trading beyond EU borders, and should leverage leading measurement, monitoring, reporting, verification, and certification frameworks.
4. The system must create a pathway for future improvements – specifically, the incorporation of full supply-chain emissions and direct tracing that links data and gas imports through physical, contractual, or volume-based mechanisms.
5. The system should be as uniform as possible among the Competent Authorities of the Member States, both to create certainty for suppliers and to avoid a "race to the bottom" by authorities.
6. The system must be transparent, independent and free from conflict of interest.
7. The system must be aligned with emissions data reliability and completeness requirements, ensuring the use of empirical measurement data and accurate estimation of methane intensities representative of the relevant production regions.

Existing Proposals

As stated above, in other contexts, the tracing of commodities through supply chains is neither novel nor prohibitively complex. In fact, some stakeholders have already responded to the adoption of the MER with proposed solutions. Below we describe features of three leading approaches: "trace and claim," "book and claim," and "trace and aggregate".

Trace and Claim

Advanced by the non-profit Clean Air Task Force (CATF), a contributor to this discussion draft, the "trace and claim" approach seeks to track gas trades (i.e. contracts, not molecules) across supply chains and through the various exchanges and trading hubs where gas is bought and sold, utilizing secure registries. This approach would create a traceable line from producer to importer by requiring that a plausible physical pathway exists, monitoring and accounting for the gas volumes to ensure that producers and midstream operators are not able to sell more low-methane gas than the throughput of physical infrastructure would allow, and following the chain of custody along the full commercial supply chain, from transaction to transaction.

By directly linking supply to demand through the tracing of transactions, low-methane attributes would remain attached to physical volumes compared to potentially detached attributes in a book and claim system, ensuring that gas that is actually imported into Europe meets the methane intensity requirements, potentially sending a stronger signal to international producers and exporters to adopt robust MRV and mitigation practices consistent with the MER.

For many simple supply chain pathways, trace and claim can be adopted immediately; however, application for more complex supply chains will require cooperation between a diverse set of stakeholders across each value chain, including producers, midstream operators, gas marketers and exchanges, LNG operators and potentially regulators on issues such as contract structuring, emissions accounting and the creation and management of interoperable secure registries. The complexity of the system combined with the need for extensive cooperation in certain cases leaves significant doubt about whether the system can be universally implemented in the timeframe required by the regulation.

Book and Claim

In a "book and claim" approach, certificates generated by low-methane gas producers can be purchased by buyers and permanently retired via a registry to avoid double counting. As a general feature, book and claim systems allow gas buyers to purchase certificates that are decoupled from actual volumes contracted between counterparties. However, some book and claim systems also allow for bundling of certificates with contracted volumes, which effectively functions as a trace and claim approach within a larger book and claim system.

The geographic scope of certificate tradability is a key defining characteristic. A "global book and claim" approach would allow supply to be "booked" and demand to be "claimed" anywhere in the world, divorcing certificates from any geographic constraint. Such an approach would have significant limitations to demonstrate compliance with the MER reporting requirements and would not align with the regulation's goal of incentivizing emissions reductions. Under a "global book and claim" system, importers could continue to purchase volumes from any exporter, as long as MRV-compliant certificates generated globally were commensurate with the amount of gas Europe imported. This would significantly limit incentives to invest in methane abatement relative to other approaches.

A "constrained book and claim" approach would allow for book and claim within a delineated country or region – as defined by a single, connected physical infrastructure network under common jurisdictional control, such as in the US or a subdivision of the US – while effectively requiring a tracing approach between countries or regions. For example, if the book and claim system was constrained by country, gas buyers would need to match gas volumes imported from the US with certificates generated from US production. MiQ, the gas-certifying non-profit, introduced its Certificate Inter-Regional Import System (CIRIS) for import standard compliance earlier this year. CIRIS is an example of a constrained book and claim model.

While this approach may enable price signals that favor methane mitigation between countries or regions, it likely would dilute such signals within a country or region. If the region is narrow enough (e.g., a single production basin), constrained book and claim would incentivize emissions reductions similarly to other approaches. Compared to trace and claim or trace and aggregate, constrained book and claim is a simpler system that allows more flexibility in compliance and less disruption to current gas markets but also allows for the separation of the gas's environmental attributes and underlying volume delivered for export. Constrained book and claim is already being implemented on a voluntary basis, although it is not clear that certificates generated today would satisfy MRV compliance standards under the MER.

Trace and Aggregate

The trace and aggregate approach was initially proposed by Cheniere. Under this approach, the feedgas volumes to the export terminal are either traced to a basin of origin based on what is known from supply agreements between the exporter and a producer or, in the case where gas is purchased from a marketer, are determined through a combination of contractual information and modeling as described in Cheniere's peer-reviewed publication in the American Chemical Society's Sustainable Chemistry and Engineering Journal in 2024. The MRV data and emissions information would consist of a combination of data from producers who are performing MER-compliant MRV (i.e. through OGMP L5 or equivalence with Article 12), and – for producers who are not conducting such MRV efforts – derived site-level data based on public data, along with available measurement data. The derived producer MRV data estimates would be created by a credible scientific organization. In the final step of trace and aggregate, the LNG export terminal operator would provide an aggregated MRV certificate to the LNG offtaker or importer that has been verified by an independent third party. By aggregating producers and their respective volumes, this approach allows individual gas producers to be anonymized, thereby protecting proprietary trading strategies.

There are a number of outstanding areas of uncertainty about implementing the trace and aggregate approach. First, this proposal is difficult to fully evaluate due to the lack of clear and consistent public documentation of how this approach would work in practice. More information is needed to understand how basins of origin would be inferred in cases where the exporter does not have a direct supply agreement with the producer, which implies understanding how pipeline nominations and flows can be statistically associated with upstream production basins over time periods that correspond with emissions measurement intervals. Additionally, the proposal hinges on securing commensurate and ongoing funding to materially expand work from leading scientific organizations, along with legal and logistical challenges associated with implementing field studies globally; more information is needed on whether this can be broadly implemented and managed at scale and in the timeline set out by the European Methane Regulations. Finally, it is unclear whether other LNG operators, beyond Cheniere, will be willing and able to implement the trace and aggregate approach and whether anonymization of producers and site/facility-level data would be acceptable to EU regulators.

Our Proposal: A Hybrid Approach

It is entirely possible to both satisfy the principles outlined above and meet the current regulatory requirements. Given the inadequacies of a book and claim approach with insufficient constraints as well as the practical challenges of universal adoption of trace and claim and trace and aggregate, a phased hybrid approach would be most appropriate whereby the system used to trace environmental attributes is as direct as possible for a given supply chain. Below we outline indicative use cases that illustrate how the approach could be applied in different supply chain contexts.

Importers should be required from the outset to demonstrate to Competent Authorities the origin, MRV and methane characteristics of their gas supplies by tracing the transactions of the imported natural gas. Specifically, EU importers should be required to demonstrate direct tracing for all gas volumes in instances where the importer has a direct supply agreement or material equity ownership with a producer, except in cases where the importer can demonstrate that volumes were shipped to locations other than the EU.

Additionally, in cases where the supply agreement is with an LNG operator (including an LNG supply aggregator/marketer) or pipeline operator, importers should require that the LNG or pipeline operator provide the importer with all available information about the origin of the gas under that agreement, to the extent that information can be determined via supply agreements between LNG or pipeline operators and their suppliers, and should demonstrate direct tracing for all such volumes.

For more complex supply chains, in the near term, some flexibility in demonstrating the origin and characteristics for compliance with Annex IX reporting requirements may be appropriate. Where importers or their LNG suppliers source gas from intermediaries and direct tracing is currently less practicable – e.g., purchases on energy exchanges through which it would be very difficult to track volumes across multiple trades – importers should be permitted to acquire constrained book and claim certificates corresponding to volumes of low- methane-emissions gas generated in the same country or region as the seller.

While this paper is focused on gas-tracing regimes, including the use of certificates, it does not attempt to address issues regarding certificate quality. That said, it should be noted that the certification ecosystem is evolving rapidly; and the intent and integrity of the EU methane regulation demands that any certificates used for compliance meet the standards for MRV set forth in Articles 8, 9, 12 and 28.[1]

For more complex supply chains, constrained book and claim certificates containing necessary information required under Annex IX could suffice for demonstrating compliance with the 2025, 2027 and 2028 deadlines, by which importers are required to provide information to Competent Authorities about the origins of the imported gas and the producer-level MRV and methane intensity characteristics of the gas. However, once gas supplies are loaded onto an LNG ship or export pipeline, a direct tracing approach between regions should be required – as physical transport can be easily tracked through transactions or by attaching certificates to bills of lading, customs declarations, certificates of origin and the like.

This dynamic approach will ensure that all importers provide regulators with the highest quality of evidence possible to meet Annex IX reporting requirements, in line with the complexity of their supply chains. It also gives industry stakeholders (e.g., producers, transporters/pipelines,

[1] There are valid concerns and unresolved questions about the appropriate role for low methane certificates in a regulatory compliance system. These include concerns about the quality of the measurement, monitoring, and verification practices of certifiers, as well as their credibility in determining provenance of gas when certificate trading is permitted. Important work is being done to improve certificate offerings to meet EU compliance requirements, particularly with regards to aligning standards for MRV. Examples include the recently announced MiQ monitoring, reporting and verification protocol, developed in consultation with OGMP, as well as the Energy Emissions Modeling and Data Lab's (EEMDL) verification protocol.

marketers/traders and LNG producers) ample time to jointly develop tracing systems that follow the actual volumes of compliant natural gas as closely as possible for more complex supply chains, preserving the full intent and integrity of the MER. These systems should be developed ahead of and adopted during the planned 2028 review of the MER, with the implementation to begin by 2030, when importers will be required to demonstrate compliance with the methane intensity standard set by the Commission.

Note that a transition to direct tracing is likely a prerequisite to future improvements to the MER to include full supply-chain emissions for imports – which we believe the Commission, co-legislators and stakeholders should begin working on even as the current MER is undergoing phased implementation between now and 2030.

For supplies that are not traceable either through direct tracing or a regional certificate system – or which may be traceable, through either approach, but which fail to comply with EU MRV standards – Competent Authorities should require importers to use consistent default nation-of-origin emission intensities informed by IMEO and updated annually, and pay penalties for gas with default factor intensities greater than the threshold set by the Commission.[2]

The MER is a critical opportunity to make progress on reducing methane emissions this decade. Our organizations are committed to working together with the relevant stakeholders to support timely and effective MER implementation. We, the contributing organizations (CATF, EDF, and RMI), will engage with the Competent Authorities, other regulators, civil society, and industry stakeholders to answer the immediate concerns with technical implementation, as well as to develop a more comprehensive framework in preparation for the implementation of methane intensity reporting in 2028, and the subsequent implementation of the intensity performance standard in 2030.

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[2] As emission intensities of supplies are accounted for, first, by direct tracing via contracts or, second, through the use of certificates as recommended above, the difference between the total emissions assigned to supplies under an average national/regional default emissions factor and the emissions demonstrated for those supplies through EU-compliant MRV should be added back to the total remaining emissions assumed for the nation/region (i.e. to the numerator for all remaining suppliers for that nation/region). This will ensure that all emissions are accounted for. The default factor assigned to noncompliant production will steadily increase as additional producers demonstrate through EU-compliant MRV that their emissions are below the default factor. This should encourage additional producers to employ EU-compliant MRV if they believe their emissions are lower than the default factor and should reduce the incentive of poor performers to accept assignment of the default factor.