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Climate

The New EU Methane Regulation

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Context

In November 2023, European Union (EU) policymakers reached agreement on the first-ever legislation to reduce methane emissions.[1]

The Regulation on methane emissions reductions in the energy sector (the 'EU Methane Regulation') will require the oil, gas and coal industries to reduce methane emissions through a package of monitoring and mitigation measures in the EU and, in the future, across the supply chain.

Methane is the world's second most important greenhouse gas (GHG). It is in excess of 80 times more potent than carbon dioxide (CO_2) over a 20-year period and is responsible for approximately one-third of the warming experienced today.

According to the International Energy Agency (IEA), curbing methane emissions is the most effective means available for limiting global warming in the near-term. In the oil and gas sectors, existing technology can prevent more than 70 per cent of current methane emissions, about 45 per cent at no net cost.[2]

Oil and gas

Monitoring and reporting

The new methane monitoring and reporting framework seeks to track methane emissions by operators in the energy sector to promote accuracy and facilitate regulatory compliance with mitigation measures. Operators will be required to develop and improve source- and site-level measurements to calculate and report methane emissions using the latest methodologies, standards and technologies, such as infrared cameras, satellite sensors and mathematical models.

The EU Methane Regulation requires oil and gas operators to submit annual reports to competent authorities with methane emission estimates that improve in accuracy over time. Eventually, oil and gas operators must measure to the level of granularity in the Oil & Gas Methane Partnership (OGMP) 2.0, the flagship reporting programme of the United Nations Environment Programme (UNEP) which requires direct source-level measurements complemented by direct site-level measurements to improve accuracy, including a reconciliation process to account for discrepancies.

Leak Detection and Repair (LDAR)

Methane leaks occur at each stage of the oil and gas supply chain, including production, processing, transmission, storage and distribution. Leaks tend to result from equipment malfunctions, inadequate maintenance, corrosion, degradation, accidents or improper installation, among other reasons. To tackle this issue, the EU Methane Regulation has introduced provisions on leak detection and repair, setting out a systematic process of identifying and fixing leaks.

The Regulation sets out varying inspection frequencies for different components, ranging from every three to 36 months. When a leak above a certain threshold is detected, mandatory repair of the emitting component is triggered and subject to a subsequent survey within a prescribed period to ensure its repair.

A shortcoming of the legislation is that not all detected methane leaks must be repaired. Moreover, the inspection frequencies can be up to 36 months for certain equipment, reducing their effectiveness. Regulators have found that reductions in methane emissions of 90 per cent can be achieved with monthly inspections, compared to 40 per cent with annual inspections.[3]

Limits to venting and flaring

Venting and flaring are significant sources of methane emissions. Venting entails deliberate methane release into the atmosphere while flaring combusts methane that would otherwise be vented to produce CO_2 and water vapor. In practice, however, inefficient flaring results in the incomplete combustion of methane ('methane slippage'). Field studies in the US have revealed nearly five times higher methane emissions from flaring than previously estimated.[4]

The EU Methane Regulation prohibits venting and flaring in the EU, allowing exceptions only for emergencies, malfunctions or specific scenarios such as equipment repair or maintenance. Operators will also need to notify the competent authority in case of a venting or flaring event, subject to verification. Moreover, the Regulation introduces technical standards to curb venting by mandating the replacement of equipment that vent by design with alternative technologies that perform the same function, but with lower or zero emissions.

Inactive, temporarily or permanently plugged and abandoned wells

Inactive wells continue to emit methane long after use unless properly remediated, reclaimed or plugged. To date, the EU has not undertaken an inventory of its inactive wells and their methane emissions, despite the fact that inactive wells also contribute to air and groundwater pollution by leaking toxic substances, posing risks to local communities and the environment.

To tackle this issue, the EU Methane Regulation mandates that Member States establish an inventory of all inactive, temporarily or permanently plugged and abandoned wells and develop methane mitigation plans to remediate, reclaim and permanently plug the wells. An exception is granted for countries with more than 40,000 inactive wells, allowing them additional time to complete the inventory. This is expected to benefit Romania in particular, which is estimated to have tens of thousands of historically abandoned wells within its borders.[5]

Coal

The EU Methane Regulation also addresses monitoring and mitigation in the coal sector; however, negotiations between Parliament and Council significantly diluted these provisions.

An analysis by non-profit organisation Ember estimates that the Commission's initial proposal targeted a 70 per cent reduction in emissions from coal mines by 2040, whereas the final provisions agreed will result in only 34 per cent reduction.[6]

Monitoring and reporting

Similar to the oil and gas sectors, coal operators must implement monitoring, reporting and mitigation measures for both active and inactive mines. Within 12 months, operators must submit yearly methane emission reports to competent authorities, with the level of detail dependent on the facility type.

Operators will also need to submit an inventory of all their closed or abandoned mines within 12 months and conduct measurement on those mines within 24 months. Monitoring can stop if operators prove emissions are below one tonne annually for six consecutive years (for flooded mines) or 12 years (for dry mines).

Mitigation

To curb methane emissions in the coal sector, operators are subject to restrictions on venting and flaring, effective from 2025 in drainage stations, 2027 in ventilation shafts and 2030 for closed or abandoned underground coal mines.

The initial Commission proposal contained a venting threshold of 0.5 tonnes methane per kilotonne of coal for thermal coal mines; however, the final agreement has increased this threshold to five tonnes of methane per kilotonne of coal until 2031, after which the threshold will be lowered to three tonnes.

Another notable weakness in the Regulation is the delayed implementation of venting thresholds for methane-intensive coking, which will only take place within three years of the entry into force of the Regulation. Coking coal mines emit approximately 200 thousand tonnes of methane annually, constituting just under half of emissions from active underground mines in the EU.

Imports

While measures on EU segments of the supply chain are vital, the benchmark for success of the EU Methane Regulation is how it will address the upstream segments of the supply chain.

The EU relies on imports for 70 per cent of its hard coal consumption, 97 per cent of its oil consumption and 90 per cent of its fossil gas consumption.[7] Therefore, 75-90 per cent of the methane emissions associated with fossil fuels consumed in the EU are emitted before reaching the EU's borders.[8]

The impact assessment of the Regulation has found that imports into the EU of oil and fossil gas contribute approximately nine million tonnes CO2-equivalent (MtCO2e),[9] surpassing the CO2 emissions from 56 coal-fired power plants.[10] This compares to 1.03 million tonnes of methane emissions from oil and fossil gas in the EU, equivalent to 25.8 Mt CO2e.[11] Even a small methane leakage rate of 0.2 per cent can result in the net climate impact of gas being equivalent to coal.[12]

Recent estimates of methane emissions from fossil gas exporting countries reveal significant under-reporting, with some estimates much higher than 0.2 per cent. For example, satellite studies estimate a leakage rate of 4.1 per cent at two of the world's largest natural gas fields, Galkynysh and Dauletabad in Turkmenistan, which has recently secured a deal to export gas to the EU.[13]

The EU Methane Regulation provides partial solutions to the issue of emissions from imported fossil fuels via a three-step approach:

- First, within 24 months (around 2026), the Commission will publish a methane performance profile for Member States, EU producers and importers, using data from competent authorities via a methane transparency database. This step is essentially information sharing with no obligation for actual methane monitoring or mitigation

- Second, by January 2027, the Commission will introduce monitoring, reporting, verification (MRV) equivalence. For new contracts, importers will need to prove to the authorities that the oil, gas, or coal they are importing into the EU meets the same monitoring and reporting standards set by the EU Methane Regulation. For older contracts, importers must make best efforts to ensure their suppliers meet the requirements, keeping the authorities updated each year and explaining when requirements are unmet

- Third, within six years (around 2030), EU producers and importers, for contracts made or renewed after the six-year period, must prove to authorities that the methane intensity of their product is below the maximum levels set by the European Commission.

The approach has been widely criticised as inadequate to address methane emissions from imports with the effectiveness, accuracy or urgency required. For example, intensity standards focus on reducing methane emissions per unit of output and do not directly limit total aggregate emissions. Therefore, if production increases, total emissions can still rise even with a lower methane intensity standard.

Moreover, the envisioned timeframe is too protracted. IPCC pathways that limit warming to 1.5°C, with no or limited overshoot, require global methane emissions to be reduced by 34 per cent below 2019 levels by 2030.[14] Implementing a performance standard in 2030 clearly does not align with this objective.

Conclusion

The EU Methane Regulation lays the groundwork for a regulatory framework to reduce methane emissions in the energy sector.

However, significant strengthening of the Regulation, in particular mitigation measures and targets in the coal sector and on imports, will be required to ensure it is fit for purpose to keep the goal of limiting warming to 1.5˚C within reach.

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