Certification of Natural Gas With Low Methane Emissions: Criteria for Credible Certification Programs

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Certification of Natural Gas With Low Methane Emissions: Criteria for Credible Certification Programs

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Acknowledgments:

We would like to thank the following co-contributors for their support: Andrew Baxter, David Lyon, Erin Murphy, Ted Kelly, Rosalie Winn.

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1. Introduction

Methane, the primary component of natural gas, is a short-lived but potent greenhouse gas; in the approximate decade that methane remains in the atmosphere, its impact on the climate is substantial. Over a twenty-year period, methane's warming potential is about 84 times that of carbon dioxide (CO_2).[1] Human-caused methane emissions have been increasing and continue to rise.[2] According to some estimates, curbing these emissions represents an opportunity to limit the current rate of warming by as much as 30 percent.[3]

The oil and gas sector is a major contributor to rising global methane emissions. [4] After agriculture, it is the largest source of anthropogenic emissions.[5] Moreover, recent measurement-based efforts indicate that traditional methods for estimating methane emissions from oil and gas activities systematically underestimate total emissions.[6] In some cases, these underestimates could be as high as 60 percent.[7] At the same time, best available data suggest large shares of methane emissions from the oil and gas sector can be abated at low or net-zero cost.[8]

Nations around the world are taking note of the importance of limiting methane emissions. In 2021, over 100 countries pledged to reduce the global methane footprint 30 percent below 2020 levels by 2030.[9] As a major source of methane emissions and mitigation potential, the oil and gas industry must grapple with extracting and selling oil and gas in this increasingly climate-conscious world.

Differentiated gas is a relatively new concept that attempts to assuage concerns around the climate impact of natural gas production. Although no standard definition exists, differentiated gas (also called responsibly sourced gas (RSG) or certified gas) refers to natural gas that is purported by operators as having undergone independent third-party certification and that the gas has been produced under specified best practices around methane mitigation.[10] Most definitions also include best practices around minimizing other environmental and community impacts.[11] The latter are not discussed here.

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[1] IPCC, 2021
[2] NOAA, 2021
[3] Ocko et al., 2021
[4] EDF, n.d.
[5] IEA, 2022
[6] Allen, 2014; Brandt et al., 2014; Zavala-Araiza et al., 2015; Alvarez et al.,2018; Weller et al., 2020
[7] Alvarez et al., 2018
[8] IEA, 2022
[9] IEA, 2022
[10] Hallahan and Corral, (2021); Kinder Morgan, n.d.; Oh and Kim, 2018; Project Canary, n.d.
[11] *Id.*

Oil and gas producers may participate in a differentiated gas certification program as part of meeting a corporate sustainability goal or in order to sell the certified gas at a premium to purchasers with such goals. In some cases, such as when local distribution companies purchase certified gas, the premium may ultimately be paid by individual ratepayers.

As more voluntary differentiated gas certification programs emerge, so too do concerns around the validity of the underlying certification methods. Specific to methane emission mitigation, certification programs that do not incorporate direct measurement methane quantification methods and reduction requirements run the risk of becoming a greenwashing tool. Until certification programs address these concerns, it is possible that they will provide cover for the oil and gas industry to continue business-as-usual practices without undertaking any emission mitigation activities.

In this whitepaper we focus on one aspect of differentiated gas certification programs: methane mitigation. We explain key concerns around the methane abatement potential these programs provide. We also outline five criteria to set a standard of design for emerging certification standards. While these criteria must be fulfilled for any program claiming to certify that gas has been produced with low methane emissions, they are not exhaustive. In addition to limiting our focus to methane emissions, these criteria do not offer a blueprint for implementing certification programs. Much work remains to figure out the institutional details of how programs that incorporate these criteria should be structured to ensure meaningful and sustained emissions reductions.

2. Differentiated Gas - Background

Although the exact definition of differentiated gas varies, at its core it refers to gas that is purported to have been extracted via methods that meet certain environmental, social and methane emission best practices.[12]

Differentiated gas is a new but increasingly popular concept. The first public sale of purported differentiated gas took place in 2018 between Southwestern Energy (the seller), New Jersey Natural Gas (the buyer) and Independent Energy Standards Corp (the certifier).[13] Since 2018, differentiated-labeled sales have risen substantially. A recent Enverus Intelligence report

[12] *Id.*
[13] Magill, 2019

estimates that producer-certified gas will grow to make up about 18% of the North American natural gas market by the end of 2022. The report underscores the pace of growth by noting that 90% of this expected 2022 differentiated gas production was just announced in 2021.[14]

There is little doubt that this surge in certification reflects growing public pressure on oil and gas companies to reduce their methane emissions. Proponents of differentiated gas claim that certification can help companies develop a competitive edge by signaling ethical practices to consumers and potential employees. Other analysts believe that the market will naturally converge on gas that meets certification standards, and that rather than the exception, differentiated gas will become the norm and uncertified gas will be pushed out of the market.

While it is possible that high-integrity certification programs can deliver some methane emission reductions, current certification programs are developed on an ad hoc basis without any standard certification requirements. This raises legitimate concerns around the abatement potential of these programs, which are discussed in the next section. Until these concerns are addressed, it is inappropriate for any certification program to label gas as having low methane intensity.

3. Certification Challenges

In this section we outline the core concerns around current certification program designs. These concerns largely stem from the lack of standards around methane quantification and coverage. Other concerns are rooted in the voluntary nature of these programs.

Lack of measurement, reporting and verification (MRV) standards: Peer-reviewed studies using direct methane measurements continue to demonstrate that actual emissions are significantly higher than operator and regulator estimates. Without comprehensive direct measurement and independent verification (MRV) and transparency around intensity calculations, there is no way for natural gas producers, certifiers or customers to know what the actual emissions intensity of the certified gas production is and whether it actually meets the differentiated gas certification standards. However, some certifiers currently certify gas as having a low methane intensity based solely on spreadsheet emission estimates that are not based on direct methane measurements.

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[14] Enverus, 2022

Limited participation: High-integrity certification could incentivize some operators to reduce emissions. However, participation in voluntary certification schemes is up to individual industry actors. There is therefore a high risk that only a few already low-emitting operators would choose to participate. This would imply limited additional emission reductions from certification programs.

Cherry-picking within company portfolios: The potential for emissions reductions is further diminished by limited coverage of participating companies. This is because many certification schemes allow participating operators to choose to only certify gas from facilities that already have good emissions performance. Often, different production facilities have significantly different emissions levels based on geology and other factors outside of the operator's control, as well as other extraneous factors such as state or local regulations or facility age. Since certification is voluntary, companies are more likely to choose to certify facilities that are already low-emitting due to such factors. This would imply minimal or even zero additional emission reductions from certification programs.

4. Five Certification Design Criteria

To address the above issues, the following five criteria must be met for a certification program to be regarded as credibly addressing methane emissions. By definition, the concerns related to the voluntary nature of these programs cannot be fully addressed by certifiers—only an industry-wide mandate, such as from a government regulator, can ensure universal participation. However, they may at least be alleviated through high-integrity and transparent design.

1) Certification should require and verify that best practice work practice standards are met.

Voluntary certification programs must never be viewed as substitutes for rigorous work practice regulatory standards, measurement and reporting requirements, or any mandated comprehensive and stringent measurement-based methane emission policy.

Regulations mandating work practice standards (i.e., technology and operational standards) provide foundational reductions in both methane and local environmental pollutants across all

producers. Certification standards should support these standards by ensuring participants can demonstrate compliance with existing work practice standards.

Until the U.S. Environmental Protection Agency finalizes strong regulations for new and existing sources, strong state rules such as those in California, Colorado and New Mexico offer examples of how certification programs can demonstrate potential for additional emission reductions by making the requirements in these rules a minimum threshold for participating firms. For facilities in regions where work practice standards do not yet exist, certification programs should require and verify that a baseline set of work practice standards (see Table 1) are nevertheless met.

TABLE 1

Work Practice Standards

Requirements
Regular instrument-based monitoring for leaks and abnormal emissions, including at smaller sites, and timely repair of leaks
Transition to zero-emitting pneumatic devices
Prohibition of routine venting and flaring
Control/capture requirements for tank emissions
Reduced emission well completions
Liquids unloading best practices
Emission standards for reciprocating and centrifugal compressors

In addition to binding regulation for stringent work practice standards, policy instruments based on direct measurement and MRV standards would also be preferable to a voluntary program. For example, regulations requiring compliance with a binding emission performance standard (or other policy instrument targeting emission quantities) could cover the full set of a jurisdiction's oil and gas facilities and emission sources, in contrast to a certification program where participation is optional. Mandated standards would also leverage the monitoring and enforcement resources and authority of the federal/state regulatory agency and are therefore preferred to voluntary certification programs.

2) Certification must be based on high-integrity monitoring and reporting consistent with Oil and Gas Methane Partnership (OGMP) 2.0 Level 5.

The OGMP 2.0 Framework provides guidance on integrating bottom-up and top-down direct methane measurements and reporting emissions.[15] The highest reporting tier, Level 5, includes requirements for all sources of methane emissions and requires direct measurement at both the source and site level,[16] including methane emissions from vented, fugitive and incomplete combustion emissions. Covered emissions should also include intermittent emissions, both intentional and those due to abnormal process conditions. The latter is especially important as they can cause events with extremely high emissions.

Advanced methods consistent with this reporting level are also important because almost all measurements are snapshots of emissions, often at different spatial scales. These methods provide the best available guidance on translating such measurement snapshots into total annual emissions estimates needed for certifying differentiated gas.

Key features of robust measurement-based monitoring and reporting include:

- a methodology informed by direct measurement across varying spatial and temporal scales and based on statistically representative samples;
- a methodology which integrates top-down and bottom-up measurement data to validate emissions estimates;
- emissions estimates reported with associated uncertainty.

In addition to the above requirements, OGMP participants commit to reporting their emissions data to the United Nations Environment Programme's International Methane Emissions Observatory (IMEO) for corroboration against independent emission data sources.[17] In line with the OGMP requirements, certification program participants should also publicly disclose their verified emissions estimates on an annual basis in addition to details on the measurements and methodologies employed (see additional disclosure recommendations identified in item 5 below).

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[15] OGMP 2.0, 2020
[16] *Id.*
[17] *Id.*

3) Certification must be accompanied by verification from a credible and independent third party.

The IMEO offers one promising example of independent third-party corroboration of company-reported data.[18] IMEO will independently corroborate company-reported methane data from OGMP companies by scientifically evaluating "the accuracy of emission estimates based on independent observations such as field studies and satellite data." However, IMEO will not play a verification role. Furthermore, there is currently no established system for accreditation of third-party verifiers to assure that a verifier is (1) fully independent of the company certifying its gas and (2) has the expertise required to verify a company's self-reported methane emissions data.

Ideally, there should be an established process by which verifiers are accredited by a respected and knowledgeable body that attests to the verifier being able to carry out accurate verification of an operator's reported emissions. Although focused on reducing emissions from deforestation and forest degradation, the Architecture for REDD+ Transactions (ART) offers an example of such a body.[19] ART is an independent program that operates a registry system for tracking REDD+ programs. Before programs are issued credits, their program must be approved by an ART-approved verifier using ART's evaluation standards.[20]

Until a similarly robust body to accredit oil and gas emissions estimates is established, any certification program will need to be fully transparent about the methods they use for third-party verification of emissions data and the extent to which the data relies on independent methane measurements and data to corroborate the reported methane emission intensities.

4) Certification must be based on an intensity standard that is no greater than the Oil and Gas Climate Initiative's (OGCI) metric of 0.20% and declines over time.

The OGCI metric defines methane intensity as total volume of methane emissions divided by total volume of marketed gas.[21] The metric is already used by companies that account for 30% of

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[18] UNEP, n.d.
[19] ART, n.d.
[20] ART, 2021
[21] OGCI, 2021. See p 15.

global production and could be adopted as an industry standard.[22] Note that some companies report an alternative metric of methane emissions normalized to total energy content of their oil and gas production. This metric can be converted to the equivalent OGCI percent emission rate by adjusting by the relative fraction of energy production from oil versus natural gas.

The OGCI intensity target of 0.2% is recommended, as many operators' baseline intensities are above this limit and would therefore result in meaningful emissions reductions if broadly adopted. Based on best available measured emissions data, the aggregate U.S. methane emission intensity may be over 2%.[23] Furthermore, certification programs should also require the intensity target to ratchet down over time. This will ensure long-term emission reductions as the understanding of what constitutes a binding target improves and as new regulations and improved technologies drive emission reductions. It will also guarantee continued reductions even as overall intensities decline.

Finally, in line with a yearly MRV reporting requirement, the emissions intensity metric should be updated and calculated each year and reported as an annual average (e.g., total annual methane emissions divided by total volumes of gas sold over the year).

5) Companies seeking certification must specify which of their assets they are certifying, the share these assets represent relative to their entire portfolio and the emissions intensity of the certified assets. In addition, companies seeking certification must report a company-wide emissions intensity.

Requiring companies to report both detailed information regarding the production that they seek to certify as well as their emissions intensity at the company level will make it harder for companies to selectively report only on low-emitting facilities. Company-level metrics would also encourage operators to look for abatement opportunities across their entire portfolios.

Transparency around certification is essential to enable public understanding. Certification of differentiated gas products should include and disclose, at minimum, the following information:

a) The assets to be certified and the share these assets represent relative to the company's entire portfolio, by volume of marketed gas;

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[22] OGCI, n.d.
[23] Alvarez et al., 2018

b) Company-wide methane emissions intensity as a yearly average (total annual methane emissions divided by total volumes of gas sold over the year);

c) Verified methane emissions estimates on an annual basis;

d) Explanation of how regulatory work practice and reporting standards are satisfied;

e) The technology and methodology employed for measurement, verification and reporting of methane emissions.

5. Conclusions

These criteria provide a starting point for developing a standard for certifying the methane emissions intensity of gas production as meaningfully lower than the national average. If emerging certification schemes put these criteria at the center of their design, the credibility and methane mitigation potential of these programs would significantly increase. Moreover, if done well, certification programs can increase consumer understanding and trust in differentiated gas products while also proving the feasibility and potential of measurement-based methane MRV methods. Transparently meeting these criteria may help improve the quality and credibility, as well as scale, of existing programs and potentially also support the design of policy instruments based on methane emissions quantification and MRV.

However, even if certification programs adopt these criteria, it is essential to remember a few limitations. First, voluntary certification is not a substitute for regulation. Even the best voluntary programs will not deliver the large emissions reductions needed to achieve the methane reductions required to reach the Paris Agreement temperature target. Second, these criteria are not a blueprint for implementation. There are still many institutional design elements that need to be developed for these certification programs to work well in practice. These include finding the resources it will take to run these programs with the independence required for them to be credible, establishing the details of how best practice third-party verification should be done, and establishing an accreditation body for the verifiers. Finally, these criteria are focused on methane abatement. Additional certification criteria specifying environmental best practices to limit other pollution and environmentally damaging impacts and to safeguard local communities will likely entail a similar level of scrutiny.

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