Center for Energy Regulation & Policy Analysis,
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Certified Natural Gas

MAINTAINING AND EXPANDING WYOMING'S EXPORT MARKETS

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About the School of Energy Resources (SER)
SER collaborates with stakeholders at the state, national and international levels to advance energy technologies and policies to grow and support Wyoming's robust energy sector. SER's mission is to promote energy-driven economic development for the state, and it leads the University of Wyoming's talent and resources for interdisciplinary research and outreach, fulfilling Wyoming's promise to be a global leader in a thriving and sustainable energy future.

Introduction

Natural gas plays a vital role in the global energy mix as well as Wyoming's energy industry and economy. The State is among the top ten in both natural gas reserves and marketed natural gas production.[1,2] While natural gas is projected to remain a part of the global energy mix for years to come, there has been a keen focus at state, regional, and federal levels to reduce emissions associated with its production and use.[3] Although the federal focus has shifted due to the new presidential administration, state and regional focus will likely remain the same.

Wyoming only consumes about one-tenth of the natural gas it produces, with the remainder being exported primarily to states that have enacted greenhouse gas (GHG) policies designed to reduce the consumption of fossil fuels. These state and regional policies have been amplified by GHG policies at the federal level that place an emphasis on climate impacts associated with natural gas production, transportation, and usage. All of these factors are separately buttressed by investor interest in companies that prioritize environmental stewardship including the use of lower carbon fuels. These preferences are being implemented, in part, through Environmental, Social and Governance (ESG) policies and goals. Additionally, European and Asian markets have also enacted GHG regulations and initiatives that will be applied to liquefied natural gas (LNG) imports. Taken together, these policies will necessitate the production and export of low methane intensity (MI) and low carbon intensity (CI) natural gas in order to remain competitive in domestic and global energy markets. MI measures the ratio of methane released versus the total amount of natural gas produced.[4] "Carbon intensity is the measure of how much CO_2 and the CO_2 equivalent of other greenhouse gases are emitted per unit of production."[5]

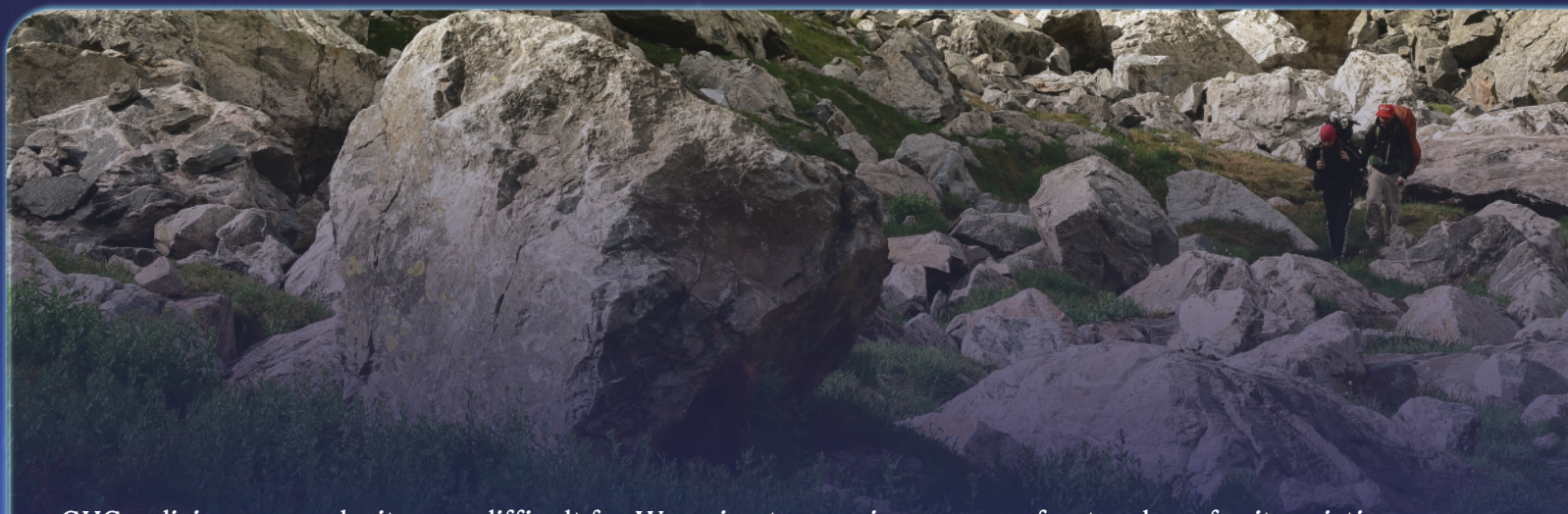
[1] *U.S. Crude Oil and Natural Gas Proved Reserves, Year-end 2022,* U.S. ENERGY INFO. ADMIN. (EIA) (April 29, 2024), https://www.eia.gov/naturalgas/crudeoilreserves/pdf/Table_8.pdf (data for 2022 shows Wyoming with 9th largest amount of wet natural gas reserves of L48 states).

[2] *Wyoming State Profile and Energy Estimates,* EIA (June 20, 2024) https://www.eia.gov/state/?sid=WY.

[3] *Global Energy Perspective 2023: Natural gas outlook,* MCKINSEY & COMPANY (Jan. 24, 2024), https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2023-natural-gas-outlook

[4] Trevor Cross, *Understanding methane intensity: Do you know where your methane intensity is,* VALIDERE (Apr. 19, 2022), https://blog.validere.com/understanding-methane-intensity#:~:text=Methane%20emissions%20are%20calculated%20based%20on%20the%20methane,methane%20released%20versus%20the%20total%20natural%20gas%20produced.

[5] Deb Ryan, Bhavini Patel and Eric Yep, *Measuring carbon intensity: The first step to emissions reduction and net-zero goals,* S&P GLOBAL COMMODITY INSIGHTS (Oct. 12, 2022), https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/101222-carbon-intensity-net-zero-goals-emissions-reduction.



GHG policies may make it more difficult for Wyoming to remain a source of natural gas for its existing markets; however, with the proper approach, they have the potential to create opportunities upon which Wyoming natural gas producers and the State can capitalize. Not only does Wyoming natural gas have relatively low MI and CI in comparison to that which is produced in other states west of the Mississippi River,[6] but Wyoming producers are also increasing the proportion of certified natural gas being produced in the State. "[Certified natural gas] is natural gas that has undergone independent certification to verify that methane monitoring and emissions reduction practices have been employed."[7] Generally, certified natural gas has a lower MI than non-certified natural gas and meets the GHG requirements being established in Wyoming's existing natural gas export market.[8]

The debate over a national certification program for certified natural gas remains ongoing; however, there is broad consensus on the essential components of a framework that would assure purchasers that the required attribute profile has been achieved to meet clean energy goals and statutory mandates. Given the critical role that natural gas production plays in Wyoming's economy, it is important for Wyoming policymakers to understand the basic components and associated opportunities of natural gas certification in order to preserve the State's market share and potentially expand exporting prospects.

The purpose of this paper is to explore the components of certified natural gas by: (1) describing the purposes of certification; (2) providing information on the process and components of certified natural gas; (3) explaining the different certification programs and voluntary frameworks, including recent trends and how they are playing out in the energy markets; (4) explaining the slow growth of certified natural gas to date; and (5) providing recommendations for ways the State can remain competitive in markets that have enacted GHG policies.

[6] D. Burns et. seq., *Attribution of Production-Stage Methane Emissions to Assess Spatial Variability in the Climate Intensity of US Natural Gas Consumption*, 2021 Env't Rsch. Letter 16 044059 (April 8, 2021), https://iopscience.iop.org/article/10.1088/1748-9326/abef33 (citing Figure 3); *see also*, Ellie Potter, *States Looking to Decarbonize May Need to Weigh Their Gas's Origin – Study*, S&P GLOBAL MARKET INTELLIGENCE (March 18, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/states-looking-to-decarbonize-may-need-to-weigh-their-gas-s-origin-8211-study-63228122.

[7] Kiera Zitelman, *Certified Natural Gas: Primer, Regulatory Landscape, and Contributions Toward a Low-Carbon Future*, NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS (Feb. 2024), https://pubs.naruc.org/pub/D42D84E6-FC2A-CA17-6E4D-A82BD8EB2BB8

[8] *Ibid.*

Purpose of Certified Natural Gas

Certified natural gas is reduced MI and CI natural gas that has been verified through monitoring and measurement, then "marketed and sold based on its verifiable environmental properties, particularly the intensity of methane emissions throughout the value chain."[9] Certified natural gas serves a myriad of purposes, including creating a competitive advantage in markets with GHG reduction policies, enabling natural gas operators to meet increased federal regulatory and global air quality requirements, and allowing companies to achieve ESG policies and goals.[10]

In 2022, pipeline flow and production data show that approximately 80% of Wyoming's dry natural gas production flowed to California, Nevada, Oregon, and Washington.[11] All of these states have separately adopted GHG reduction policies that impose a variety of economy-wide targets or requirements related to statewide GHG emissions, some of which are specifically aimed at reducing natural gas consumption. Many of the targets and requirements assess both methane and carbon dioxide emissions.[12]

These state GHG policies will make it challenging for Wyoming to remain a viable source of natural gas to these markets; however, certified natural gas, with its low methane and carbon attributes, will hold a competitive advantage. Recognizing that certified natural gas can help California, Nevada, Oregon, and Washington meet their GHG reduction policies and goals, Wyoming natural gas producers are increasing the proportion of certified natural gas being produced in the State. These operators are devoting time, effort, and expense to produce lower MI and CI natural gas in order to preserve their market share, and possibly create additional market opportunities.

[9] *What is Differentiated Gas*, THE DIFFERENTIATED GAS COORDINATING COUNCIL https://www.dgccouncil.com/what-is-differentiated-gas (last visited Nov. 15, 2024).
[10] *Ibid.*
[11] *International and Interstate Movements of Natural Gas by State*, EIA, https://www.eia.gov/dnav/ng/ng_move_ist_a2dcu_SUT_a.htm (data shows the rankings of Nebraska, Nevada, Oregon, Utah, and Wyoming) (Oct. 31, 2024).
[12] 89 Fed. Reg. 47 (Mar. 8, 2024).

In addition to creating a competitive advantage in domestic markets that have enacted GHG policies, certified natural gas will also facilitate the ability for natural gas operators to participate in global LNG markets where more stringent emissions are being applied. This includes legislation adopted by the European Union in May 2024 to reduce methane emissions from the energy sector. This regulation not only requires the European energy sector to "measure, monitor, report, and verify their methane emissions according to the highest monitoring standards and to take action to reduce them", but it also progressively introduces more stringent requirements to ensure that, over time, U.S. exporters will apply the same measurement, monitoring, reporting and verification information to EU LNG importers.[13]

Additionally, in July 2023, at Japan's annual LNG Producer-Consumer Conference, the Coalition for LNG Emissions Abatement toward Net-zero (CLEAN) was announced. This initiative, developed by Japan's JERA[14] and Korea Gas Corporation (KOGAS) with Japan Organization for Metals and Energy Security (JOGMEC) providing support as a coordinator, aims to enhance transparency for methane emissions data and to share best practices associated with the LNG value chain.[15] Japan, the U.S., the Republic of Korea, Australia, and the European Commission officially signed a joint agreement expressing "strong support for accelerated GHG reduction and methane reduction efforts across the LNG value chain, including the CLEAN initiative".[16]

Certified natural gas also enables natural gas operators to meet current stringent federal regulations associated with natural gas production, transportation, and usage. These regulations include the U.S. Environmental Protection Agency's (EPA) final standards and emissions guidelines for oil and gas operations that places more rigorous requirements on methane emissions from all new and existing oil and gas operations,[17] GHG Reporting Rule revisions that increase GHG reporting requirements and the emissions factors used to calculate methane emissions from the oil and gas sector,[18] and the Waste Emissions Charge that assesses a fee on methane emissions from the oil and gas sector that exceed emissions intensity levels set by Congress.[19] Production of natural gas that meets certified natural gas standards will facilitate operators' abilities to meet the onerous requirements set forth in these new regulations.

[13] Directorate-General for Energy, *New EU Methane Regulation to reduce harmful emissions from fossil fuels in Europe and abroad*, EUROPEAN COMMISSION (May 27, 2024), https://energy.ec.europa.eu/news/new-eu-methane-regulation-reduce-harmful-emissions-fossil-fuels-europe-and-abroad-2024-05-27_en#:~:text=With%20Europe%20importing%20a%20large%20part%20of%20the,monitoring%2C%20reporting%20and%20verification%20obligations%20as%20EU%20operators.

[14] JERA is Japan's largest power generation company.

[15] *Toward a promising future for LNG, Japan leads the world in ensuring its stable supply and addressing environmental issues*, MINISTRY OF ECONOMY, TRADE AND INDUSTRY (Dec. 15, 2023), https://www.enecho.meti.go.jp/en/category/special/article/detail_194.html#:~:text=In%20an%20effort%20to%20reduce%20methane%20emissions%2C%20the,%28KOGAS%29%20with%20JOGMEC%20providing%20support%20as%20a%20coordinator.

[16] *Ibid.*

[17] *EPA's Final Rule for Oil and Natural Gas Operations will Sharply Reduce Methane and Other Harmful Pollution*, U.S. ENV'T PROT. AGENCY (EPA) (Dec. 2, 2023), https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-operations/epas-final-rule-oil-and-natural-gas.

[18] 89 Fed. Reg. 94 (May 14, 2024).

[19] 89 Fed. Reg. 18 (Jan. 26, 2024).

While state, federal and global GHG reduction policies mandate reduced MI and CI natural gas, certified natural gas is further supported by investor interest in companies that voluntarily prioritize environmental stewardship, including the use of lower carbon fuels. Investor preferences for low-carbon and/or non-GHG emitting fuels are being implemented, in part, through ESG policies and goals. ESG "refers to a set of standards used to measure an organization's environmental and social impact" (Figure 1).[20] Although ESG policies are starting to receive pushback from some states, including Wyoming[21], the use of certified natural gas helps companies to meet their low carbon and methane policies and goals.

FIGURE 1

ESG STANDARDS[22]

As markets with GHG reduction policies are expanding, it is critical to provide products that meet those specifications, such as certified natural gas, in order to have a competitive advantage and remain a viable source of natural gas. Fortunately, Wyoming producers have been making progress toward lowering MI during production through upgraded equipment, increased data collection, and expanded leak detection and repair (LDAR) practices, and are actively meeting certified natural gas criteria.

[20] Tom Krantz, Alexandra Jonker, *What is Environmental, Social and Governance (ESG)*, IBM (Jan. 24, 2024), https://www.ibm.com/topics/environmental-social-and-governance

[21] In November 2024, Wyoming joined ten other states in filing an antitrust enforcement action against three investor companies for using coordinated and anticompetitive ESG schemes to disrupt the energy industry. Michael Pearlman, *Wyoming Pushes Back on Anti-fossil Fuel ESG-driven Asset Managers* [Press release], OFFICE OF WYOMING GOVERNOR MARK GORDON (Nov. 29, 2024), https://content.govdelivery.com/accounts/WYGOV/bulletins/3c47864

[22] Thomas Rubic, Millie Clayton, Isabella Costa, *Environmental, Social and Governance (ESG) explained: Five important considerations for companies and their lawyers*, HOLDING REDLICH (June 15, 2022) https://www.holdingredlich.com/environmental-social-and-governance-esg-explained-five-important-considerations-for-companies-and-their-lawyers

Certification Process and Components

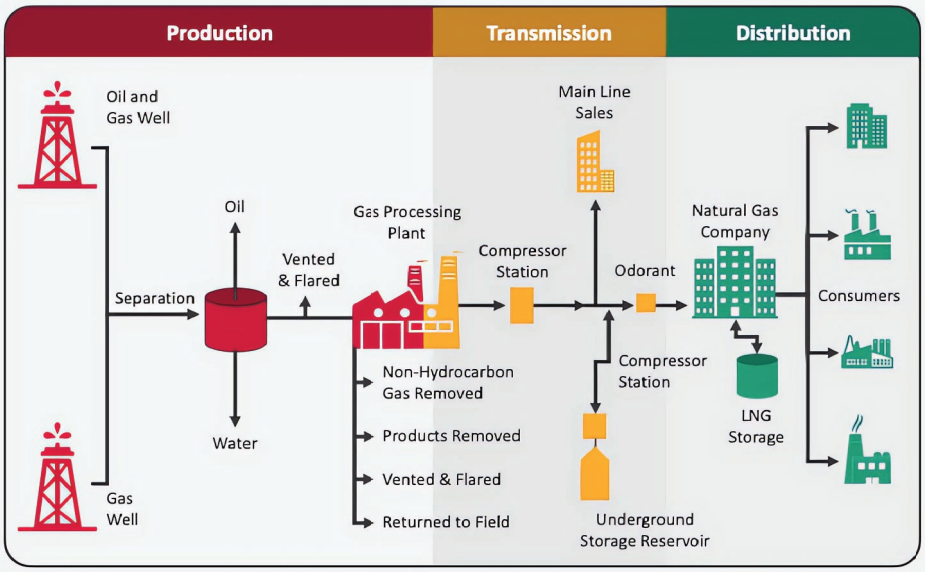
Certified natural gas programs were developed to verify environmental attributes throughout the natural gas supply chain, specifically focusing on methane and GHG emissions, with some incorporating social and governance criteria as well. Certified natural gas goes through a third-party verification process to ensure consistent reporting, transparency, and quality of the reported data.[23] Certification enables operators to differentiate their performance and allows natural gas consumers to better understand the environmental attributes and emissions associated with their natural gas supply chain and the natural gas they purchase.[24]

Natural Gas Supply Chain

The natural gas supply chain is broken down into three segments: production (upstream), transmission (midstream), and distribution (downstream) (Figure 2).

FIGURE 2

NATURAL GAS SUPPLY CHAIN[25]



[23] Sierra Fraioli, Kevin Davis, Brian Jones, *Comparison of Natural Gas Certification Programs*, THE ERM INTERNATIONAL GROUP LIMITED ON BEHALF OF THE NATIONAL GAS SUPPLY CHAIN COLLABORATIVE (Sept. 2023), https://www.erm.com/contentassets/88be880d269247c789a51e20522eeb4a/comparison-of-natural-gas-certification-programs.pdf

[24] *Ibid.*

[25] Gas Supply Chain presentation graphic, COLLIDU, https://www.collidu.com/presentation-gas-supply-chain (last visited Nov. 15, 2024).

Each segment of the natural gas supply chain is associated with certain activities and infrastructure:

- **Upstream** includes extraction of natural gas from underground, also known as development, exploration, and production
- **Midstream** includes trading, transportation, and storage of natural gas in pipelines, tanks, railcars, trucks, ships, and through other methods
- **Downstream** includes processing of raw natural gas into products for end users and distributing finished products to customers. **End users** are categorized as industrial (petrochemical plants, refineries, power generators), commercial (retail outlets, natural gas distribution utilities), and residential (residential customers of gas distribution utilities).[26]

Natural gas certification standards initially focused on the upstream segment of the natural gas supply chain; however, it has now been expanded to cover the midstream segment, including LNG terminals.[27] This has increased the transparency afforded to natural gas purchasers as they can now "string together" certified segments of their natural gas supply from production to delivery.[28]

Methane and GHG Emissions

Certified natural gas programs specifically focus on methane and GHG emissions which, in addition to measurement, include requirements for employing policies and practices to reduce emissions and implementing methane monitoring programs.[29] Methane emissions are calculated based on the MI, which measures how well a facility performs as a ratio of methane released versus the total amount of natural gas produced.[30] The MI of the upstream natural gas supply chain is a key metric taken into consideration by natural gas purchasers, and methane emissions account for approximately half of the total upstream natural gas supply chain GHGs.[31]

There are several approaches for calculating methane emissions and associated MI, and while all certified natural gas programs allow direct measurement of methane emissions, many include the use of engineering calculations[32] and emissions factors.[33,34] As such, different quantification protocols can result in significantly different emissions estimates.[35]

[26] *See supra* note 7.
[27] *See supra* note 23.
[28] *Ibid.*
[29] *Ibid.*
[30] *See supra* note 4.
[31] *See supra* note 23.
[32] Engineering calculations include many methods that can be used to estimate emissions from many sources at point source, site and asset levels. The accuracy of the estimates is dependent upon the data inputs and assumptions made which are best used in combination with direct measurement. Jasmin Cooper, Lukey Dubey and Adam Hawkes, *Methane detection and quantification in the upstream oil and gas sector: the role of satellites in emissions detection, reconciling and reporting*, Royal Society of Chemistry (2022), https://pubs.rsc.org/en/content/articlepdf/2022/ea/d1ea00046b
[33] An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the emission factor. *Basic Information of Air Emissions Factors and Quantification*, EPA (May 14, 2024), https://www.epa.gov/air-emissions-factors-and-quantification/basic-information-air-emissions-factors-and-quantification#About%20Emissions%20Factors
[34] *See supra* note 23.
[35] *Ibid.*

Estimates of methane emissions from U.S. natural gas production vary based on the production basin and other factors, but generally range from 1% to 2%.[36] While general consensus is that certified natural gas should have an MI no higher than .5% and that it is possible to achieve an MI as low as 0.05%, an MI of 0.2% is often used as the threshold for low MI natural gas.[37,38] This is evidenced in the Inflation Reduction Act (IRA) and EPA's Waste Emission Charge which applies a methane fee to oil and natural gas facilities that exceed an MI of 0.2%.[39] Accordingly, some certified natural gas programs have set an MI target of .2%.

GHG emissions are generally divided into three categories, known as scopes (Figure 3):

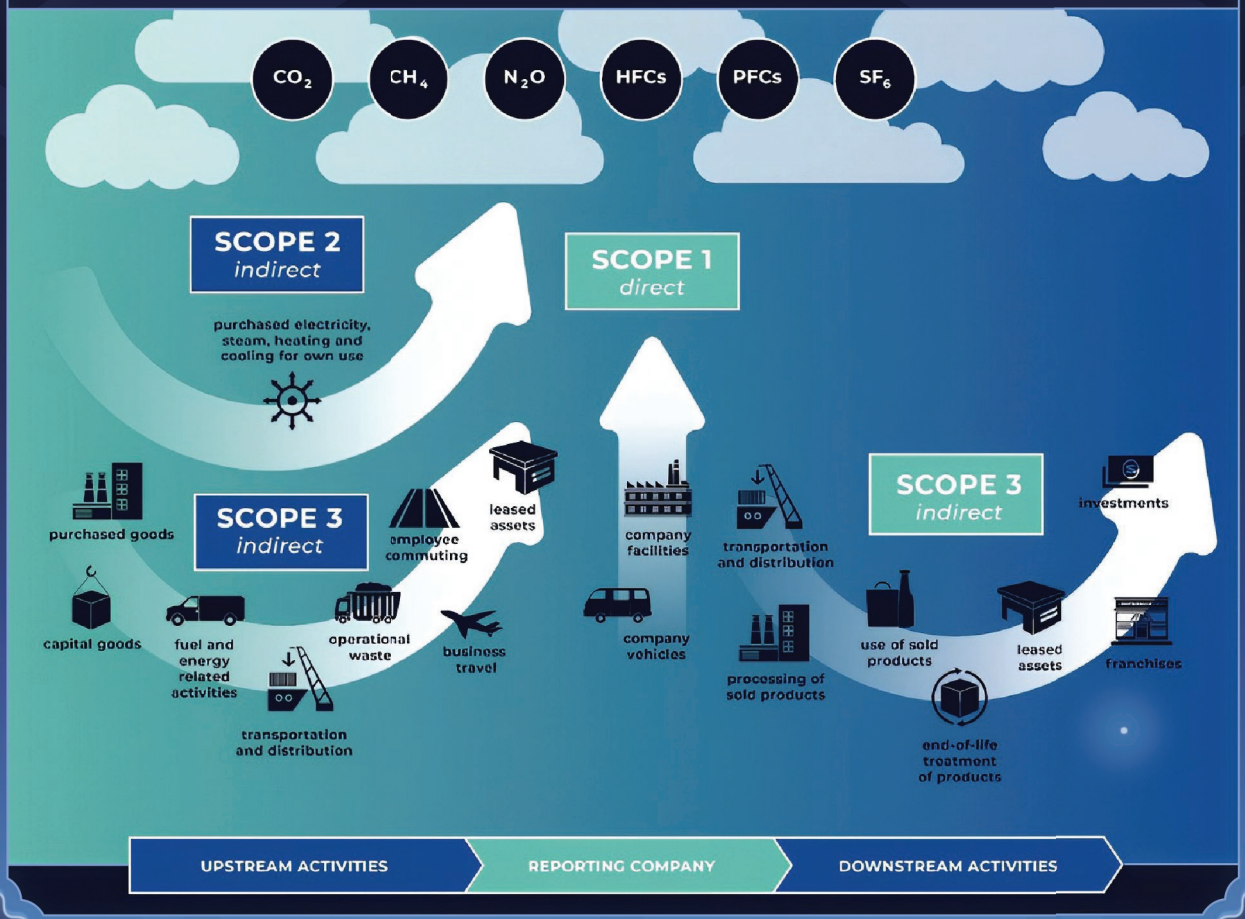
- **Scope 1 emissions** are direct GHG emissions resulting from sources that are controlled or owned by an organization.
- **Scope 2 emissions** are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.
- **Scope 3 emissions** are indirect GHG emissions resulting from value chain activities, such as the gasoline a company's employees burn when they drive to work, or the materials and supplies the company buys (i.e. when a car company buys steel, it applies to GHG emissions that result from manufacturing the steel.)[40]

Certified natural gas programs generally require Scope 1 emissions data, however, there are some that require data for Scopes 1, 2, and 3 emissions. Methane emissions, together with carbon dioxide and nitrous oxide emissions, are used to determine upstream GHG emissions.[41] Operators consider several factors, including existing monitoring systems in place, when deciding which method to use to calculate GHG emissions.[42]

[36] *Ibid.*
[37] Housley Carr, *A Whole New World – 'Certified' Natural Gas with Lower Methane Intensity Takes Center Stage,* RBN ENERGY LLC (Aug. 9, 2024), https://rbnenergy.com/a-whole-new-world-certified-natural-gas-with-lower-methane-intensity-takes-center-stage
[38] *See supra* note 7.
[39] *Ibid.*
[40] *Ibid.*
[41] *Overview of Greenhouse Gases*, EPA (Apr. 11, 2024), https://www.epa.gov/ghgemissions/overview-greenhouse-gases.
[42] *GHGRP Methodology and Verification*, EPA (Sept. 3, 2024), https://www.epa.gov/ghgreporting/ghgrp-methodology-and-verification

FIGURE 3

GHG EMISSION CATEGORIES[43]



Certified Natural Gas Data and Equipment Requirements

There are often several steps an operator needs to take to lower methane and GHG emissions to achieve higher certified natural gas standards. This includes upgrading equipment, increasing data collection, and expanding leak detection and repair (LDAR) practices to include more frequent surveys and encompass a larger area of operations, all of which can prove to be costly depending on the scope and size of operations. An integral component of natural gas certification is measurement, monitoring, reporting, and verification (MMRV) which is a multi-step process used to measure on-the-ground emissions.[44]

[43] Raymon Krishnan, *ESG, Decarbonisation and Scope 3 in Supply Chains*, LINKEDIN, (Mar. 6, 2024), https://www.linkedin.com/pulse/esg-decarbonisation-scope-3-supply-chains-raymon-krishnan-jifyc

[44] PureWest Energy, *Monetizing Environmental Attributes PowerPoint* (2023).

Measurement

Measurements can be taken at the source, site, and asset levels, depending on the specific requirements of each certified natural gas program. Initial emissions data are collected to provide empirical evidence for a clear understanding of the current state of an operator's emissions and to track changes over time.[45] Once the data is gathered, it is used to calculate emissions intensity rates.

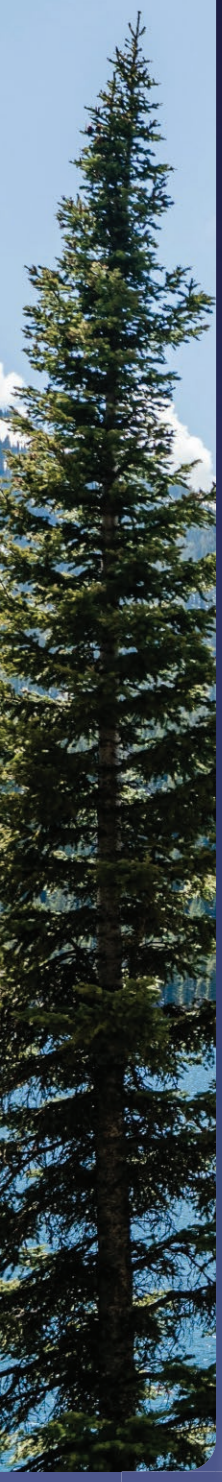
Monitoring

Monitoring emissions from the production site over time provides data and evidence to support the results of the measurement phase and during the reporting and verification phases.[46] Monitoring also assists operators in identifying anomalies or deviations from the baseline determined during the measurement phase, tracking actual performance of emission reduction measures that have been implemented, and evaluating the effectiveness of mitigation actions.[47]

[45] *MMRV: A Framework for Oil & Gas Emissions Accountability*, PUREWEST ENERGY (2024), https://purewest.com/wp-content/uploads/2024/09/MMRV-The-PureWest-Approach.pdf

[46] *Ibid.*

[47] *Ibid.*



Operator measurement and monitoring is done through a variety of equipment and protocols carried out on continuous, monthly, or annual bases, many of which are already commonly used to comply with existing state and federal regulations. These are divided into bottom-up technologies and top-down technologies, where bottom-up technologies include measurements taken on location (i.e. wellheads, tanks, compressor stations, etc.), and top-down technologies cover measurements taken from overhead:

TABLE 1

BOTTOM-UP AND TOP-DOWN TECHNOLOGIES

Bottom-Up Technologies	Top-Down Technologies
On-site continuous emissions monitoring systems (CEMS) – this includes continuous emissions monitoring such as through the use of laser line sensors[48]	Source and site level aerial surveys through drones – these are generally done periodically depending on the operator
Stack testing – source level testing that measures the amount of methane or other regulated pollutants being emitted, or determines the efficiency of a control device used to reduce emissions at facilities[49]	Asset level aerial surveys through aircraft and/or satellite – these are generally completed on an annual basis depending on the operator
Optical Gas Imaging (OGI) cameras – cameras that are used to detect gas leaks (methane, hydrocarbons, and other volatile organic compounds (VOCs)) and visualize emissions that are invisible to the naked eye from multiple segments of the oil and gas supply chain[50]	
Leak detection and repair (LDAR) programs – operator program wherein leaks are identified through equipment and onsite inspections, and repaired in a timely manner	

[48] *Laser fence lines make good neighbors,* LONGPATH TECHNOLOGIES (2024), https://www.longpathtech.com/technology.

[49] *Clean Air Act National Stack Testing Guidance, EPA* (May 29, 2024), https://www.epa.gov/compliance/clean-air-act-national-stack-testing-guidance.

[50] *Gas Detection with Optical Gas Imaging (OGI) Cameras,* QUICKSET (Jan. 25, 2024), https://www.quickset.com/gas-leak-detection-ogi-cameras/.

Reporting

Reporting includes the collection, compilation, and disclosure of methane emissions data and information from the measurement and monitoring phases to state and federal agencies, such as EPA and Wyoming Department of Environmental Quality, in order to meet regulatory requirements, and through voluntary reporting frameworks to differentiate the natural gas.[51]

Part of this phase includes reconciliation, which is the process of ensuring that direct and estimated emission quantifications from the top-down technologies match those from bottom-up technologies, and correcting any discrepancies.

Verification

Verification is done to assess the data, methods, and systems used to measure, monitor, and report methane emissions. Mistakes and uncertainties are identified and corrected during this phase. Verification often takes place through third-party verifiers to ensure impartiality and credibility. Third-party verifiers review and confirm methane emissions data and information, provide an objective and unbiased assessment of the measurement, monitoring, and reporting systems, and identify and address any discrepancies and errors.[52]

[51] *See supra* note 45.
[52] *Ibid.*

Certified Natural Gas Certification Programs

There are several certification programs that natural gas operators can use to certify their natural gas, each with a different scope and set of standards. Some programs take a broad look at ESG considerations across the natural gas supply chain, and others focus on methane emissions from upstream natural gas.[53] Some of the programs result in a third-party assigned grade or level of certification; however, as an alternative to certified natural gas, companies are increasingly using voluntary frameworks to prove the emissions profile associated with their natural gas through monitoring and measurement without a formal third-party rating.

The primary certification programs and voluntary frameworks currently being used by natural gas operators in the U.S. are: (1) Project Canary; (2) MiQ; (3) Equitable Origin; and (4) the Oil and Gas Methane Partnership (OGMP) 2.0. Each certification program has developed a framework to assess certain standards, with some providing an independent, third-party rating. The ratings are associated with specific operations within the natural gas supply chain with traceable and verifiable attributes then being assigned to those operations.[54]

Project Canary

Project Canary is a for-profit methane emissions certification provider that currently certifies approximately 11% of U.S. natural gas production.[55,56] Its assessment program, referred to as the TrustWell Standard, is available for onshore upstream and midstream operations, and evaluates operators on specific environmental, safety, and community-impact related metrics that are grouped into the following four categories:

1. Environmental performance
2. Well integrity
3. Safety
4. Community[57]

[53] *Q&A with Thomas Fox on the State of Certified and Differentiated Gas*, BRIDGER PHOTONICS (July 16, 2021), https://www.bridgerphotonics.com/blog/qa-thomas-fox-state-certified-and-differentiated-gas.
[54] *See supra* note 23.
[55] *See supra* note 7.
[56] Timothy Gardner and Jarrett Renshaw, *Biden admin works on 'green' natural gas as U.S. vies for top LNG spot*, REUTERS (Mar. 3, 2023), https://www.reuters.com/business/energy/biden-admin-works-green-natural-gas-us-vies-top-lng-spot-2023-03-03/.
[57] *See supra* note 23.

Navigating Project Canary's assessment program is an onerous process that requires development of a policy and plan, document review, subject matter expert interviews, and site visits to every wellbore and facility to create a full representation of the associated environmental impacts.[58] Project Canary allows operators to select which well pads go through the certification process, but they do not allow operators to select the wells on the selected well pad.[59]

The assessment program also includes separate, but integrated, components called the Low Methane Rating (LMR) and the Freshwater Friendly Rating. An LMR is applied to operators who achieve an MI of 0.2% or less at both a basin and facility level, along with proven efforts to mitigate or eliminate emission sources (Table 1).[60]

TABLE 2

PROJECT CANARY LMR CRITERIA[61]

Rating	Methane Intensity	Rating
LMR Minimum Qualification	≤ 0.20%	Minimum Requirements
LMR A	≤ 0.20%	Minimum Requirements + Further Differentiated Practices
LMR AA	≤ 0.10%	Minimum Requirements + Further Differentiated Practices
LMR AAA	≤ 0.05%	Minimum Requirements + Further Differentiated Practices

Components of the LMR program include:

1. Pad-specific MI values
2. Basin-level MI
3. Monitoring technology requirements
4. Disclosure of CI
5. Disclosure of public emissions targets and goals[62]

The Freshwater Friendly Rating is applied when operators:

1. Track the percentage of water sourced for operations pulled from freshwater sources;
2. Track the percentage of produced water that is recycled for reuse; and
3. Complete at least one baseline study or community impact study pertaining to water usage.[63]

[58] *See supra* note 7.
[59] *See supra* note 23.
[60] *See supra* note 7.
[61] *See supra* note 23.
[62] *Ibid.*
[63] *TrustWell by Project Canary Technical Components Overview*, PROJECT CANARY https://www.projectcanary.com/wp-content/uploads/2021/05/TrustWell-by-Project-Canary-Technical-Doc.pdf (last visited Nov. 15, 2024).

Project Canary has sensors that can be used to monitor emissions, however, use of its sensors or monitoring systems are not required. Emissions monitoring data are accepted from a wide variety of technologies, including satellites, aerial monitoring, and point source measurement equipment.[64] The only requirement is that the measurement and monitoring equipment meet Project Canary's prescribed technical standards and monitoring frequency.[65] Project Canary further requires that methane emissions are "quantified using EPA's GHGRP methodologies, which are the emission factor- and engineering calculation-based approaches also used by the LMR."[66] EPA's GHGRP methodology also allows for empirical data to be used as required through the IRA Methane Emissions Reduction Program.[67]

Annual evaluations of operator assets, which include recommendations of ways to improve future operations, are conducted by Project Canary staff.[68] The TrustWell assessment process results in a rated grade and MI metric, or a silver, gold, or platinum rating (Figure 2).[69]

FIGURE 4

PROJECT CANARY TRUSTWELL RATINGS[70]

MiQ

Established in 2019, MiQ is an independent non-profit methane emissions certification provider that currently certifies approximately 20% of U.S. natural gas production.[71] MiQ has developed certification standards for all segments of the natural gas supply chain, except distribution. This includes offshore production, onshore production, gathering and boosting and processing, transmission and storage, and LNG.[72]

[64] *See supra* note 7.
[65] *See supra* note 23.
[66] *Ibid.*
[67] *Methane Emissions Reduction Program*, EPA (Nov. 21, 2024), https://www.epa.gov/inflation-reduction-act/methane-emissions-reduction-program.
[68] *See supra* note 23.
[69] *Ibid.*
[70] *TrustWell Standard Definitional Document PowerPoint*, PROJECT CANARY (Sept. 1, 2020) https://www.projectcanary.com/wp-content/uploads/2021/01/IES-TrustWell-Ratings-Definition-Doc.pdf.
[71] *The Growing Market for Certified Natural Gas, Center for Strategic & International Studies (Energy 360 Podcast Transcript)*, CENTER FOR STRATEGIC & INTERNATIONAL STUDIES (Mar. 18, 2024), https://www.csis.org/analysis/growing-market-certified-natural-gas.
[72] *See supra* note 7.

MiQ provides separate certifications for facilities based on supply chain segment (i.e. certification for onshore production includes all production-related operations on a basin-level).[73] According to MiQ, this type of facility-level certification deters operators from selectively including only high-performing equipment.[74] All detected emissions associated with each certificate are included in an MI score. MiQ has also developed a Carbon Intensity Standard that allows for the calculation of CI for all segments of the natural gas supply chain.[75]

MIQ's assessment program, the Methane Emissions Performance standard, evaluates operators based on methane emissions intensity, methane mitigation practices, and methane emissions monitoring.[76] Each of these elements are considered for certification of each supply chain segment, however, the approach and requirements vary based on relevance and applicability.[77]

The MiQ certification process requires the involvement of four entities:

1. Operator
2. Certifier (MiQ)
3. Technology Provider
4. Verifier or auditor[78]

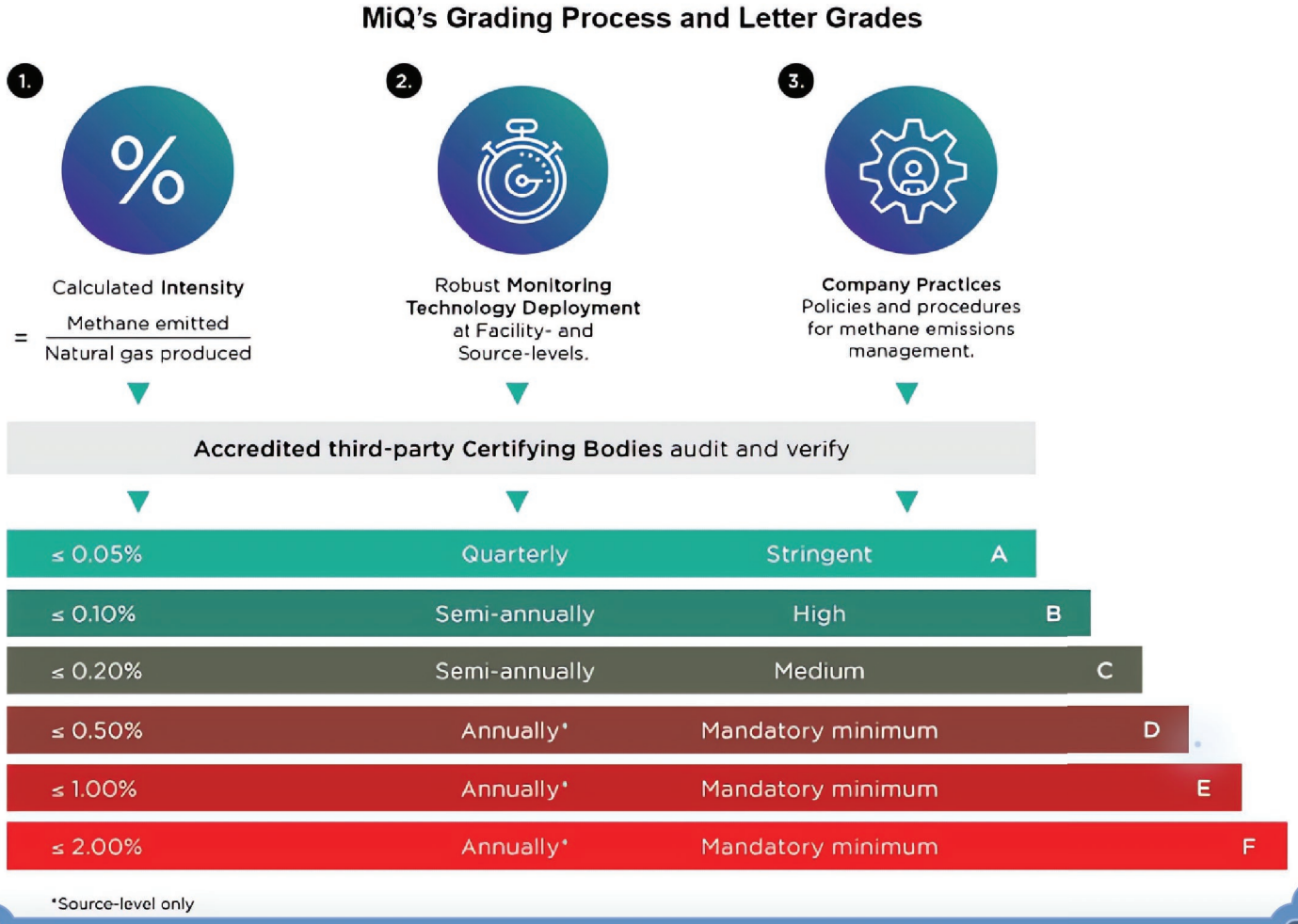
MiQ conducts an evaluation of an operator's facilities, which includes both on-site visits and desktop reviews of methane emissions calculations, reconciled emissions inventories, mitigation strategies, and monitoring programs.[79,80] MiQ does not require any particular measurement and monitoring equipment be used, it only specifies that it be a combination of bottom-up and top-down monitoring technologies.[81] MiQ does not provide or sell monitoring technologies, as it views providing both certification and monitoring technology as a conflict of interest.[82] Instead, technology providers are responsible for detecting emissions from an operator's facility.[83]

Independent third-party auditors, selected by operators from a list of those that are trained and approved by MiQ, evaluate and prepare a report regarding operator policies and performance against the MiQ standard, and recommend a grade for the operator based on an A-F grading system.[84,85] Once the report is reviewed and approved by MiQ, the operator receives a basin-wide certification and grade (Figure 3).[86]

[73] *See supra* note 23.
[74] *See supra* note 71.
[75] *See supra* note 23.
[76] *Ibid.*
[77] *Ibid.*
[78] *See supra* note 7.
[79] *See supra* note 23.
[80] *Ibid.*
[81] *See supra* note 7.
[82] *See supra* note 71.
[83] *The MiQ Standard*, MIQ, https://miq.org/technical-information/ (last visited Nov. 22, 2024).
[84] *Ibid.*
[85] *See supra* note 23.
[86] *Ibid.*

FIGURE 5

MiQ GRADE LEVELS[87]



MiQ also offers a Certified Supply Chain assessment wherein certificates from each segment can be combined to certify and provide an emissions profile for the full supply chain.[88] MiQ certification is valid for one year, with auditors conducting annual audits to confirm and make necessary adjustments to an operator's certification status and performance grade.[89]

[87] *See supra* note 37; *see also*, Fig2_MiQ's Grading Process and Letter Grades.png (846×600) (rbnenergy.com).
[88] *See supra* note 23.
[89] *Ibid.*

Equitable Origin

Equitable Origin is a non-profit company that currently certifies approximately 13% of U.S. natural gas production. Equitable Origin provides certification through its EO100 Standard for Responsible Energy Development based on the following five principles:

1. Corporate governance, transparency, and ethics
2. Community engagement and human rights
3. Indigenous peoples' rights
4. Occupational health and safety and fair labor
5. Climate change, biodiversity, and environment[90]

Operators are scored based on meeting, exceeding, or leading performance targets contained under each principle, which form the EO100 certification (Figure 4).[91] The certification is rated through a letter grade from A+ to C, where a C represents an operator meeting 70% of the performance targets of each of the five principles[92]

[90] *See supra* note 7.
[91] *Ibid.*
[92] *See supra* note 23.

FIGURE 6

EQUITABLE ORIGIN EO100 PRINCIPLES AND OBJECTIVES[93]

Principle 1: Corporate Governance, Transparency & Business Ethics	**Principle 2: Human Rights, Social Impacts & Community Development**	**Principle 3: Indigenous Peoples' Rights**	**Principle 4: Fair Labor & Working Conditions**	**Principle 5: Climate Change, Biodiversity & Environment**
1.1 Legal Compliance	2.1 Human Rights	3.1 Free, Prior & Informed Consent (FPIC)	4.1 Labor & Working Conditions	5.1 Environmental Management & Mitigation
1.2 Financial Disclosure	2.2 Fair, Inclusive Engagement & Good Faith Consultation	3.2 Engagement & Participation	4.2 Child Labor	5.2 Emergency Preparedness & Response Planning
1.3 Bribery, Corruption, Money Laundering & Financing of Terrorism	2.3 Human Rights & Security Personnel	3.3 Cultural Impacts	4.3 Forced Labor	5.3 Energy Efficiency
1.4 Management System	2.4 Land Rights	3.4 Use of Traditional Natural Resources	4.4 Freedom of Association & Collective Bargaining	5.4 Waste Production & Management
1.5 Contractors	2.5 Resettlement	3.5 Culture-Based Intelligence & Traditional Knowledge	4.5 Equal Opportunities & Treatment	5.5 Remediation of Environmental Liabilities
1.6 Transparency & Disclosure	2.6 Uncontrolled Settlements	3.6 Voluntary Isolation	4.6 Working Hours & Leave	5.6 Closure & Restoration
	2.7 Community Health & Safety		4.7 Remuneration	5.7 Greenhouse Gas Emissions
	2.8 Sustainable Community Investment		4.8 Workplace Grievances	5.8 Ozone Depletion
	2.9 Cultural heritage		4.9 Occupational Health & Safety	5.9 Biodiversity & Ecology
	2.10 Grievance Mechanism		4.10 Workplace Emergency Preparedness & Response Planning	5.10 Air
				5.11 Water
				5.12 Land
				5.13 Land Restoration
				5.14 Visual & Ambient Impacts

[93] *EO100 Standard for Responsible Energy Development,* EQUITABLE ORIGIN (July 2017, Revised May 2024), https://energystandards.org/wp-content/uploads/2024/07/EO100-Standard-for-Responsible-Energy-Development_2017_Revised2024.pdf.

Equitable Origin's EO100 certification is valid for three years, with verification assessments conducted annually through on-site and/or desktop evaluations.[94] The certification process includes the following steps:

1. Operator self-assessment against EO100 Standard, wherein companies are required to provide extensive documentation showing that their policies and practices meet the criteria for achieving certification.

2. On-site third-party assessor evaluation and report.

3. Operator development of a Continuous Improvement Plan detailing where operators can improve their operations/policies performance to continue to attain EO100 certification.

4. Independent review of third-party assessor report from step 2.

5. Equitable Origin certification decision based on the assessment and recommendations of both the third-party assessor and independent reviewer.[95]

Operators can seek EO100 certification from site-level to basin level, with production segment certification containing well pads and associated facilities in a geographical region.[96] Equitable Origin has also developed segment-specific technical supplements to the EO100 certification which cover onshore natural gas and light oil production, natural gas gathering and boosting and processing, and natural gas transmission and storage.[97] The technical supplements add specific performance targets under the five principles used to achieve the EO100 certification.

Oil and Gas Methane Partnership (OGMP) 2.0

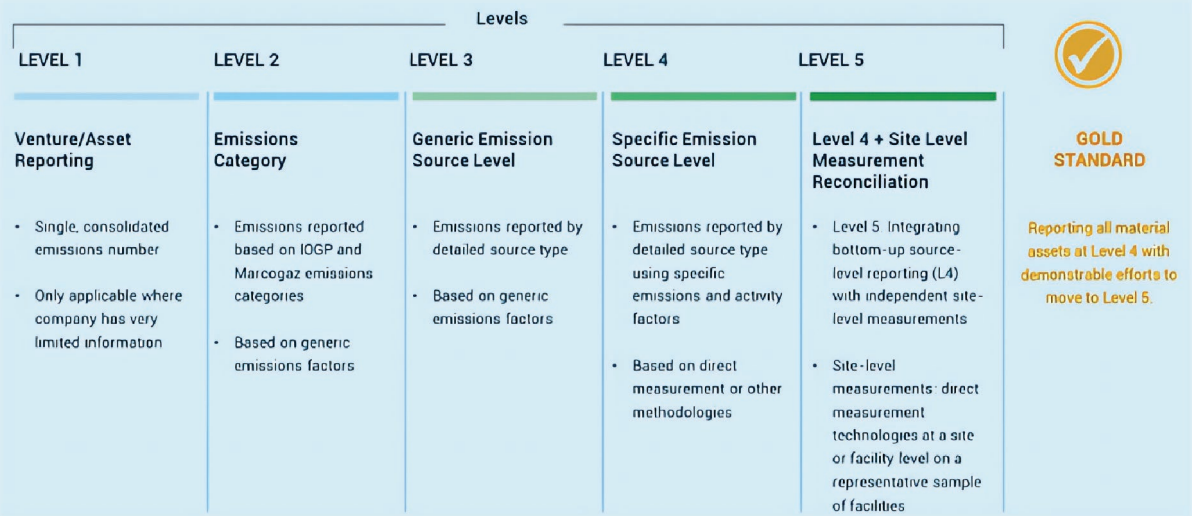
OGMP 2.0 is a measurement-based framework that was launched by the United Nations Environment Program (UNEP) and the Clean Air Coalition to incorporate direct measurement into methane emissions inventories.[98] Both DOE's efforts to develop a global MMRV framework for LNG exports and the EU's recently enacted methane regulation are based on OGMP 2.0.[99] OGMP has more than 100 major upstream and midstream companies as members, including Jonah Energy, PureWest, Occidental, Williams, EOG Resources, and Devon Energy.[100]

OGMP 2.0 has five levels of reporting (Figure 5) with operators that participate in the program at Level 5 committing to report scope 1 emissions annually using science-based measurement frameworks rather than imprecise emission factors.[101]

[94] *See supra* note 23.
[95] *Ibid.*
[96] *Ibid.*
[97] *Ibid.*
[98] *Ibid.*
[99] *See supra* note 13.
[100] *See supra* note 7.
[101] *Ibid.*

FIGURE 7

OGMP 2.0 REPORTING LEVELS[102]



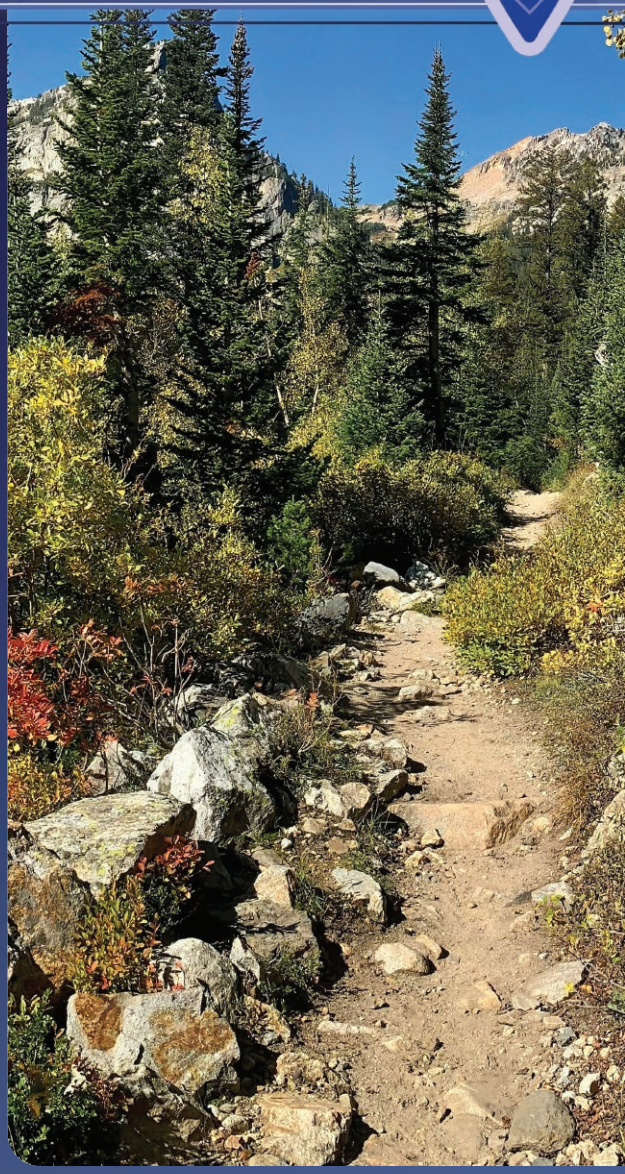
Operators achieve the OGMP 2.0 Gold Standard of methane quantification by developing both bottom-up equipment-level and top-down site-level emissions estimates using direct measurement and then reconciling those numbers into a single estimate.[103] The reconciliation must be completed within three years of enrollment for all operated assets, and within five years for non-operated assets.[104] "OGMP 2.0 provides guidance on what approaches qualify as direct measurement or equivalent for major source categories, but it does not provide detailed technical guidance on quantification or reconciliation methodologies."[105] Operators must also commit to MI reduction targets that become more stringent every year.

Equitable Origin, MiQ, and Project Canary are increasingly aligning with OGMP 2.0's framework by allowing or requiring direct quantification of methane emissions, particularly as natural gas purchasers are demanding differentiation based on direct measurement.[106] In fact, Equitable Origin incentivizes operators to quantify emissions consistent with OGMP 2.0's Level 4 or 5, and MiQ allows operators to submit a measurement-informed inventory in alignment with protocols such as OGMP 2.0.[107]

While OGMP is not a natural gas certification provider, operators have been using it to sell low MI and CI natural gas to utilities and LNG exporters. This is accomplished by stringing together OGMP 2.0's top-down/bottom-up reconciliation of emissions from upstream production assets, blockchain technology tracked and measured emissions from the production segment through the transmission segment, and independent third-party auditor verification.[108]

[102] *See supra* note 23.
[103] *Ibid.*
[104] *Ibid.*
[105] *See supra* note 7.
[106] *See supra* note 23.
[107] *Ibid.*
[108] *See supra* note 7.

Impediments to Certified Natural Gas Growth



Certified natural gas production is a way for Wyoming natural gas producers to gain a competitive advantage in domestic and global markets with GHG reduction policies. Even though certified natural gas markets continue to increase, growth has been slow. This is primarily due to upstream production costs and market price premiums.

Many operators will have difficulty affording the equipment upgrades needed to meet recent federal regulations requiring increased monitoring and emissions control, let alone the equipment to meet the additional data collection requirements and verification associated with natural gas certification programs. This is particularly true for small Wyoming producers, which in 2022, included 181 companies that each produced one percent or less of the state's total natural gas, accounting for 11 percent of Wyoming's natural gas produced.[109]

It was initially anticipated that certified natural gas would carry a premium of around $0.15 per thousand cubic feet (Mcf), which would help to offset the upstream costs of certification.[110] In actuality, the premiums have been much lower, ranging between $0.01 to $0.06 per Mcf.[111] While it is less expensive to use the OGMP 2.0/blockchain/auditor process than going through a natural gas certification provider, there are still significant costs associated with the attendant measurement and monitoring requirements. This will make it difficult for many Wyoming producers to certify their natural gas.

[109] *Oil and Natural Gas Resources in Wyoming January 2023 Summary Report*, WYOMING STATE GEOLOGICAL SURVEY (Jan. 2023), https://www.wsgs.wyo.gov/products/wsgs-2023-OG-summary.pdf.

[110] Liz Hampton and Scott Disavino, *Focus: U.S. natural gas producers hope customers will pay more for 'green gas'*, REUTERS (June 30, 2021), https://www.reuters.com/business/energy/us-natural-gas-producers-hope-customers-will-pay-more-green-gas-2021-06-30/.

[111] *See supra* note 7.

Most states require natural gas supplies to be purchased based on lowest cost that essentially blocks the procurement of certified natural gas which carries a price premium. Some states are seeking ways to address the lowest cost requirement to allow for the purchase of certified natural gas, with Tennessee and Virginia passing legislation in 2022:

- **Tennessee Natural Gas Innovation Act** allows utilities to request the Public Utilities Commission to authorize a cost recovery mechanism to use or develop infrastructure to facilitate innovative natural gas resources for customers, with a cost cap set at 3 percent of the annual cost of gas.

- **Virginia Energy Innovation Act** defines low-emission natural gas as having an MI of .20 or less as verified through a qualified certified natural gas trading platform. It further allows for the purchase of natural gas that would reduce the emissions intensity of its fuel portfolio in addition to a lowest cost requirement.

California has shown interest in doing something similar with the introduction of legislation in 2023 encouraging the purchase of natural gas to shift to certified natural gas "where feasible, cost effective, and in the best interests of ratepayers and determined by the Public Utilities Commission."[112]

In addition to the lowest cost requirement, states would need to address confusion around who pays the premium, be it shareholders, ratepayers, or both, or neither. With all these things to be considered, utilities may initially opt to offer certified natural gas to customers on a voluntary basis, keeping in mind that certified gas is blended in the pipeline with non-certified gas from other sources, so the customer is receiving a mix of both. [113]

Although the growth of certified natural gas usage has been slow to date, expansion should be expected as continued demand and policies ease the way for its procurement and use.

[112] *Ibid.*
[113] *See supra* note 37.

Recommendations

In addition to creating a competitive advantage in domestic markets that have enacted GHG reduction policies, certified natural gas will facilitate the ability for natural gas operators to participate in global LNG markets where more stringent emissions regulations are being applied. It is imperative that Wyoming policymakers employ concrete efforts to increase the recognition of certified natural gas production in the State, and the role it plays in meeting market GHG reduction goals. As energy policy related to certified natural gas at the state and regional levels continues to evolve, ample opportunities are available for Wyoming policymakers to influence those endeavors, and impact outcomes that defend its existing market share and access new certified natural gas markets.

The following are recommendations for Wyoming policymakers to consider.

1. State advocacy around the availability and use of Wyoming certified natural gas

   - Designate specific legislators to serve as liaisons to engage directly with colleagues in Wyoming's primary natural gas markets of California, Oregon, Washington, and Nevada regarding their ongoing statutory efforts to implement GHG reduction goals. These liaisons can educate their colleagues about the low-carbon nature of Wyoming natural gas and urge them to amend current GHG reduction statutes to recognize the inherent benefits of using Wyoming certified natural gas to meet their clean energy goals. This engagement will increase awareness of Wyoming certified natural gas, highlighting its inherent climate benefits, energy security, and reliability attributes.

   - The Wyoming Energy Authority, in pursuit of its mission to encourage and promote Wyoming energy, should be given the resources to adequately undertake direct engagement with the following entities/state agencies to advocate for Wyoming certified natural gas:

     California: California Energy Commission
     California Air Resources Board
     California Public Utilities Commission

     Oregon: Oregon Department of Energy
     Oregon Department of Environmental Quality
     Public Utilities Commission of Oregon

Washington:	Washington State Energy Office Washington State Department of Ecology Washington Utilities and Transportation Commission
Nevada:	Nevada Governor's Office of Energy Nevada Division of Environmental Protection Nevada Public Utilities Commission

WEA engagement could focus on increasing awareness of Wyoming certified natural gas, highlighting the inherent climate benefits, energy security, and reliability it provides. WEA, through the development of strategic relationships, could advocate for Wyoming certified natural gas.

2. Creation of a State-led cooperative program

   Create a State-led cooperative program through the Wyoming Oil and Gas Conservation Commission to establish an affordable voluntary certification process for small operators that would like to produce certified natural gas but lack the necessary resources. The program would include sharing best practices and data collection methodologies, and providing a cost-share for MMRV and certification requirements. Assisting operators to navigate the certified natural gas process on a voluntary basis would increase the amount of Wyoming certified natural gas being available to markets with GHG reduction goals. It would also enable Wyoming natural gas producers to fulfill EU methane regulation requirements, putting them in a good position for LNG exports.

3. Building data collection and improving accuracy of emissions estimates

   Utilize the School of Energy Resources to provide support to the State-led cooperative program by providing data collection and informing ways to increase the accuracy of methane emissions estimates and reconciliation.

Conclusion

As markets that have enacted GHG policies expand, it will be increasingly important for Wyoming to be a reliable source of certified natural gas. In addition to creating a competitive advantage in these markets, certified natural gas will also enable natural gas producers to meet increased federal regulatory and global air quality requirements and allow companies to achieve ESG policies and goals. Forecasting these changing market demands, Wyoming producers have been making progress toward lowering MI during natural gas production and are actively meeting certified natural gas criteria.

There are numerous certification programs that operators can use to certify their natural gas, each with a different scope and set of standards. Certification providers assign a grade or level of certification to be associated with specific operations within the natural gas supply chain, and traceable and verifiable attributes are then assigned to those operations.

Operators often need to take several steps to meet certified natural gas measurement and monitoring requirements, and to lower methane and GHG emissions to certified natural gas standards. This includes upgrading equipment, increasing data collection, and expanding LDAR practices. All of this can prove to be costly depending on the scope and size of operations, making it difficult for small operators to participate.

In an effort to reduce the costs associated with certifying their natural gas, some operators are selling low MI and CI natural gas to utilities and LNG exporters without the use of natural gas certification providers. This process includes the use of voluntary monitoring and measurement frameworks to prove the emissions profile associated with their natural gas, linked together with emissions from other segments of the natural gas supply chain tracked and measured through blockchain technology, and independent third-party verification. While this option would make it viable for some smaller producers to sell low MI and CI natural gas, it would still, unfortunately, be unaffordable for many of them.

Many opportunities exist for Wyoming policymakers to defend the State's current natural gas market share, access new certified natural gas markets, and ensure continued development, production, and consumption of the State's natural gas. This includes State advocacy around the availability and use of Wyoming certified natural gas, and the creation of a State-led voluntary cooperative program to help small operators to produce certified natural gas and increase the amount of Wyoming certified natural gas available to markets that have enacted GHG policies. In addition, continued use of research and data collection from the School of Energy Resources can assist Wyoming producers in navigating the challenges and opportunities presented by certified natural gas.

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