

Direct Methane Measurement

Whereas, at least a quarter of today's global warming is caused by methane emissions from human sources.¹ Methane is 86 times more potent than carbon dioxide over a 20-year period, meaning emissions reduction now can buy valuable time to address the climate crisis.

In 2019, 30% of U.S. methane emissions from human activities came from natural gas and petroleum systems, from venting, flaring, and leaking.²

Methane emissions can be quantified directly through measurement (e.g., by detector, drone or satellite), or indirectly through calculations and modelling. However, the Environmental Protection Agency (EPA) formula used to estimate methane emissions is not a good foundation for a corporate mitigation strategy, as it fails to capture many major leaks, wasting valuable product (worth \$2 billion per year) and substantially underestimating emissions.³ Studies have found actual emissions to be between 50 and 90% higher than estimated emissions reported using the formula.⁴ In certain basins, studies have found emissions to be more than 10 times higher than industry disclosed figures.⁵ As a result, oil and gas industry Scope 1 emissions may be significantly higher than currently reported.

Companies that do not manage methane emissions jeopardize other industry decarbonization efforts, and risk their reputation and license to operate, as investors, regulators and civil society are setting expectations to address this issue.

In 2021, investors managing more than \$5.35 trillion supported strong federal methane regulations.⁶ The U.S. joined the Global Methane Pledge, committing to using best available inventory methodologies to quantify methane emissions.⁷ Companies, including U.S. companies EQT and Jonah Energy, have joined the Oil and Gas Methane Partnership, committing to improving methane data quality and consistency.⁸

¹ <https://www.unep.org/news-and-stories/press-release/methane-observatory-launched-boost-action-powerful-climate-warming>

² <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

³ <https://www.edf.org/climate/methane-studies>

⁴ <https://www.science.org/doi/full/10.1126/science.aar7204>,
<https://www.seas.harvard.edu/news/2021/03/oil-and-natural-gas-production-emit-more-methane-previously-thought>

⁵ https://business.edf.org/files/Investors-Guide-to-the-OGMP_09.17.21_FINAL.pdf

⁶ <https://www.ceres.org/news-center/press-releases/major-investors-demand-ambitious-methane-regulations-us>

⁷ https://ec.europa.eu/commission/presscorner/detail/en/IP_21_4785

⁸ <http://ogmpartnership.com/partners>

According to EPA data, Antero Resources has one of the lowest methane intensities (0.05%) of U.S. top 100 oil and gas producers.⁹ However, given the limitations of EPA's methodology it is unclear whether this leadership ranking can be trusted.

Resolved, shareholders request that the Board oversee the preparation of a report analyzing a critical climate change concern, the reliability of Antero's methane emission disclosures. The report should:

- summarize the outcome of any efforts to directly measure methane emissions by the Company;
- provide investors with insight as to whether there is likely to be a material difference between direct measurement results and the Company's published estimates of methane emissions;
- assess the degree to which any differences would alter estimates of the Company's Scope 1 emissions.

The report should be made public, omit proprietary information and be prepared at reasonable cost.

Supporting Statement:

At management's discretion, we recommend that the report:

- Provide a narrative explanation of the difference between the Company's estimated methane emissions and the Company's own direct measurements, or any third-party measurements, by site or region;
- Describe any efforts to validate emissions estimates and disclosure through a third-party audit or evaluation.

⁹ https://www.ceres.org/sites/default/files/reports/2021-06/OilandGas_BenchmarkingReport_FINAL.pdf