



ELIMINATING METHANE EMISSIONS FROM THE ENERGY AND PETROCHEMICAL SECTORS

The European Union (EU) is at a crossroads. Long underreported and mostly ignored, awareness of the true magnitude and climate impact of methane emissions has increased significantly in recent years, in particular from the energy and petrochemical sectors. It is well accepted that fossil gas* is incompatible with EU climate objectives and a healthy climate system, requiring **decisive action from EU policymakers and a commitment to phase out fossil gas by 2035**.¹

The Paris Agreement, the Governance Regulation, the European Green Deal and Strategic Plan for Methane provide vehicles for transitioning the EU economy away from its reliance on fossil gas and **rapidly addressing methane emissions from the energy and petrochemical sectors**.² Put another way, the EU has the responsibility to promote non-fossil alternatives based on local and sustainable alternatives and, in the process, achieve energy security and independence while protecting the climate system and boosting the economy. It is now only a question of political will.

Data is sufficient to justify a whole host of reasonable measures. For example, intentional venting or flaring is a well-established problem; it is reasonable to prohibit EU market access to fossil gas produced at sites where methane is still vented or flared. Similarly, it is reasonable to require fossil-gas suppliers to perform periodic leakage detection and repair in order to have access to the EU market and for EU policymakers to request Member States to make plans for the eventual and inevitable phase-out of fossil gas.

Against this background, the European Commission should propose in its Strategic Plan for Methane and related policy initiatives, including the revision of the Trans-European Networks - Energy (TEN-E) Regulation and EU Strategy on Energy System Integration, immediate measures to **reduce methane emissions from the energy and petrochemical sectors within the EU and across the supply chain outside the EU**. Although not addressed here, other sources of anthropogenic methane emissions, such as those from agriculture and waste, are equally important and will require their own comprehensive package of policies. For example, mandatory EU limits and monitoring requirements to ensure limits on fugitive methane emissions from anaerobic digestion of biomass and agricultural waste are essential to complement fossil methane mitigation measures.

KEY FACTS

- Methane is **86 times more potent than carbon dioxide (CO₂) over a 20-year period**, making it the second most important greenhouse gas, contributing to 25% of warming experienced today.³
- According to UNFCCC reporting, **annual fugitive emissions from gas, oil and coal within the EU are approximately 80 million tonnes CO₂e or about 2% of the EU's total annual CO₂e emissions**.⁴

* **Note:** The term “fossil gas” is used herein instead of the term “natural gas” to differentiate between gas derived from fossil sources and gas derived from non-fossil sources, such as agriculture and waste.

- **Fossil gas comprises about one-quarter of the EU energy mix** with the EU being a major driver of global methane emissions at production sites and across the supply chain, **importing over half of globally traded fossil gas**.⁵
- Recent studies show that actual **global anthropogenic fossil methane emissions are much higher than reported—up to 40%**—with the oil and gas sector identified as the main contributor to the rapid acceleration of atmospheric methane, further exacerbating its climate impact.⁶
- **Methane emissions occur across the entire fossil-gas supply chain**—pre-production, extraction, processing, liquefaction, transmission, distribution, storage and use—both inside and outside the EU; **coal, oil and natural gas liquids also contribute to methane emissions**.

ADDRESSING METHANE FROM THE ENERGY AND PETROCHEMICAL SECTORS

The Commission should propose a package of policies that will immediately begin to cut methane emissions from the energy and petrochemical sectors across the supply chain, headlined by:

- a **phase-out of fossil gas by 2035** pursuant to national phase-out plans adopted by Member States, including an immediate halt to fossil-fuel infrastructure construction;
- the immediate application of **policies and measures to eliminate venting and flaring**;
- the immediate application of **policies and measures requiring leakage detection and repair** coupled with mandatory monitoring, reporting and verification;
- an **immediate ban on fracked gas**; and
- the adoption of a **mandatory methane performance standard**.

Scientists have shown that fossil gas can have no role in the EU energy system beyond 2035 to be compatible with the Paris Agreement.⁷

Fossil-Gas Phase-Out

Fossil gas is used predominantly in industry and for electricity and heating. While prioritising energy efficiency and promoting renewable energy, the EU should initiate a comprehensive transition away from the use of fossil gas including gas infrastructure in these sectors. It should plan for a forecasted phase-out of fossil gas coupled with the concurrent uptake of non-fossil alternatives:

- **Fossil-Gas Phase-Out Plans.** By 2023, and linked to the review of National Energy and Climate Plans (NECP), Member States should be required to adopt fossil-gas phase-out plans with intermediate targets setting out an immediate and evenly paced pathway toward reducing fossil-gas consumption, outlining policies for eliminating reliance on fossil gas within twelve years (by 2035).
- **Ineligibility of Financial Assistance.** Make existing and new fossil gas and fuel infrastructure projects ineligible for state aid, EU funding and loans, including pipelines, grids, LNG terminals, fossil-gas power plants and petrochemical facilities. Financial assistance should be redirected toward promoting non-fossil alternatives.

Accompanying Measures to Abate Methane Emissions Across the Fossil-Gas Supply Chain

The Commission found that, above a leakage rate of only 3% along the supply chain, the climate impact of fossil gas is worse than that of coal in power generation⁸ and increased trade in and imports of liquefied natural gas to Europe might prove to have a much higher global warming impact than anticipated.⁹

Interim and immediate measures to reduce methane emissions across the gas supply chain, both domestically and outside the EU, to the maximum extent possible should apply for as long as gas is used, designed to promote **compliance** and including **third-party certification** and verification as well as risk-based targeting mechanisms for inspections by competent authorities. These measures are often a win-win as they make economic sense for gas suppliers.

- **Immediate Ban on Venting and Flaring Fossil Gas.** Prohibit gas suppliers from placing on the market fossil gas, including energy derived therefrom, where venting and flaring occurs during production and processing unless evidence is provided that the limited use of flaring is for a legitimate purpose, *e.g.* safety testing or safe disposal of harmful gases, and no technique exists that could in actual fact capture the methane.
- **Immediate Leakage Detection and Repair (LDAR).** Prohibit gas suppliers from placing fossil gas on the EU market without undertaking mandatory and periodic (at least quarterly) leakage detection and repair (LDAR) supported by verified evidence of reductions. The Commission should establish minimum LDAR requirements, drawing upon industry-wide source-by-source best practices.¹⁰
- **Monitoring, Reporting and Verification (MRV).** Prohibit gas suppliers from placing fossil gas on the EU market without systematic and mandatory methane monitoring, reporting and verification (MRV), including documentation of LDAR compliance. Reporting should be based on a comprehensive equipment survey and application of the most up-to-date emission factors, with a directive to move to actual measurement data within two years. Data on methane emissions and LDAR should be publicly available as open source data files, in a mandated format to ensure straightforward comparison, and serve as the basis for prioritising the phase-out of the most polluting forms of fossil gas.
- **Methane Performance Standard.** Adopt a mandatory methane performance standard that caps methane emissions at 0.2% along the entire supply chain for both domestic and imported gas sold and consumed in the EU by 2025.
- **Immediate Ban on Fracked Fossil Gas.** Fracking is a particularly egregious form of fossil-gas extraction, which can be at least as bad as coal from a climate perspective due to significant methane emissions resulting from the process.¹¹ To prevent further exploitation of fracked gas, the EU should immediately prohibit fracking within EU borders coupled with an import ban on gas produced through fracking.
- **Methane Emissions from Abandoned Wells.** A significant number of wells that have ceased production continue to emit methane into the atmosphere. Competent authorities should adopt policies to ensure those wells, where ownership can be documented, are capped or filled to stop methane leakage and ensure those responsible for the leaks are paying the costs. At wells where ownership is not known, a funding program paid by direct taxes on revenue from fossil-fuel companies should ensure these abandoned wells are properly capped and leaks are stopped.

Accompanying Measures on Oil Wells

During oil drilling, fossil gas is sometimes produced as a co-product that is often wastefully vented or flared because energy companies deem it to be insufficiently profitable to be collected and sold. In those cases, accompanying measures specific to oil wells whose oil or oil products are destined for the EU market should be adopted to abate methane emissions and ensure any gas is collected and not wasted.

- **Immediate Ban on Venting and Flaring Fossil Gas.** Prohibit oil suppliers from placing on the market oil or oil products, including energy and fuels derived therefrom, where venting and flaring occurs during oil drilling and production unless evidence is provided that the limited use of flaring is for a legitimate purpose, *e.g.* safety testing or safe disposal of harmful gases and no technique exists that could capture the methane instead.

- **Immediate Leakage Detection and Repair (LDAR).** Prohibit oil suppliers from placing oil on the EU market without undertaking mandatory and periodic (at least quarterly) LDAR at production sites where gas is produced, supported by verified evidence of reductions. The Commission should establish minimum LDAR requirements, drawing upon industry-wide source-by-source best practices.¹²

Accompanying Measures on Coal

According to UNFCCC reporting, EU coal mines leaked 31 million tonnes of CO₂e of methane, representing 0.8% of EU GHG emissions; over half of this is at Polish operational mines.¹³ The EU slightly leaked more coal methane in 2017 than was leaked from the domestic oil and gas sectors.¹⁴

The amounts depend on a number of factors, the most important of which are coal rank, coal seam depth and method of mining.¹⁵ Methane leaks apply to thermal coal for power plants, and also to coal used for steel production. Methane from coal mines can be mitigated at active mines through degasification activities ahead of the mining wall, and through capture of ventilation air methane (VAM). Although the EU should phase out the use of coal as soon as possible, until such time accompanying measures to abate methane emissions are needed.

- **2030 Phase-Out of Coal-Fired Electricity and a Pathway for 100% Coal-Free Steel Production.** Similar to fossil-gas phase-out, Member States should phase out coal-fired electricity and chart a pathway for coal-free steel production.
- **Mandatory Methane Mitigation Measures.** Require ventilation air methane (VAM) capture and utilisation at all active coal mines and capture and utilisation of methane from coal degasification operations at both active and decommissioned coal mines, providing economic incentives for third-party companies to mitigate methane from abandoned coal mines where no existing owner is liable.
- **Monitoring, Reporting and Verification (MRV).** Prohibit coal suppliers from placing coal and coal products, including energy derived therefrom, on the EU market without first undertaking mandatory monitoring, reporting and verification (MRV) of methane emissions from coal mining operations, including abandoned coal mines where ownership is known.
- **Methane Performance Standard.** Adopt a mandatory methane performance standard that caps methane emissions along the entire supply chain for both domestic and imported coal sold and consumed in the EU by 2025.

Accompanying Measures on Natural Gas Liquids

Depending on the geological layers, some fossil-gas production sites contain a higher percentage of natural gas liquids (NGL), which are hydrocarbons such as propane, butane and ethane separated out from the “dry” fossil-gas (methane) stream and used in a number of applications, including as feedstocks for the production of virgin plastic pellets (resins) by petrochemical companies.

- **Immediate Ban on Venting and Flaring during NGL Production.** Prohibit suppliers from placing NGL and NGL products, including pellets and plastics derived therefrom, on the EU market where venting and flaring occurs during gas production and processing unless evidence is provided that the limited use of flaring is for a legitimate purpose, *e.g.* safety testing or safe disposal of harmful gases, and no technique exists that could in actual fact capture the methane.
- **Immediate Leakage Detection and Repair (LDAR).** Prohibit NGL suppliers from placing NGL and NGL products, including pellets and plastics derived therefrom, on the EU market without undertaking mandatory and periodic (at least quarterly) LDAR at production sites, supported by

verified evidence of reductions. The Commission should establish minimum LDAR requirements, drawing upon industry-wide source-by-source best practices.¹⁶

- **Immediate Ban on Fracked NGL and NGL products.** Prohibit the placement on the market of NGL and NGL products, including pellets and plastics derived therefrom, when produced from fracked gas.¹⁷

For more information

Tim Grabiell

Senior Lawyer
Environmental Investigation Agency (EIA)
timgrabiell@eia-international.org
+33 6 32 76 77 04

Esther Bollendorff

EU Gas Policy Coordinator
Climate Action Network – Europe (CAN-E)
esther@caneurope.org
+32 484 564 680

Frida Kieninger

Campaign Officer
Food & Water Action Europe
fkieninger@fweurope.org
+32 487 24 99 05

Ricarda Dubbert

Project Manager
Deutsche Umwelthilfe (DUH)
dubbert@duh.de
+49 30 2400867-966

Dave Jones

Coal to clean analyst
Ember
dave@ember-climate.org
+ 447586947111

References

- ¹ Anderson, K., & Broderick, J., *Natural Gas and Climate Change* (2017, University of Manchester), available at [https://www.research.manchester.ac.uk/portal/en/publications/natural-gas-and-climate-change\(c82adf1f-17fd-4842-abeb-f16c4ab83605\).html](https://www.research.manchester.ac.uk/portal/en/publications/natural-gas-and-climate-change(c82adf1f-17fd-4842-abeb-f16c4ab83605).html).
- ² European Commission. *Communication from the Commission: European Green Deal* (Brussels, 11 December 2019), COM(2019) 640 final, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN>; Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, Article 16, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0001.01.ENG&toc=OJ:L:2018:328:FULL.
- ³ Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: Anthropogenic and Natural Radiative Forcing* (Chapter 8). Page 714.
- ⁴ European Environment Agency, *Annual European Union Greenhouse Gas Inventory 1990–2017 and Inventory Report 2019*. Section 3.2.6. Available at <https://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2019>.
- ⁵ See Eurostat (November 2019). *EU Imports of Energy Products - Recent Developments*. Available at: <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/46126.pdf>; see also Eurostat (webpage, last visited 9 March 2020). *Where Does Our Energy Come From?* Available at <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html>; Eurostat (webpage, last visited 9 March 2020). *From Where Do We Import Energy and How Dependent Are We?* Available at <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html>.
- ⁶ Benjamin Hmiel et al., *Preindustrial CH4 Indicates Greater Anthropogenic Fossil CH4 Emissions* (Nature, 19 February 2020), available at <https://www.nature.com/articles/s41586-020-1991-8>.
- ⁷ Anderson, K., & Broderick, J. (2017). *Natural Gas and Climate Change*. University of Manchester. Available at: [https://www.research.manchester.ac.uk/portal/en/publications/natural-gas-and-climate-change\(c82adf1f-17fd-4842-abeb-f16c4ab83605\).html](https://www.research.manchester.ac.uk/portal/en/publications/natural-gas-and-climate-change(c82adf1f-17fd-4842-abeb-f16c4ab83605).html).
- ⁸ European Commission (2018). *In-Depth Analysis in Support of the Commission Communication COM (2018) 773: A Clean Planet for All: A European Long-Term Strategic Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy*. Page 51, footnote 128. Available at https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf.
- ⁹ Global Energy Monitor (2019). *The New Gas Boom: Tracking Global LNG Infrastructure*. Available at: <https://globalenergymonitor.org/wp-content/uploads/2019/06/NewGasBoomEmbargo.pdf>. See also The Guardian. *Booming LNG Industry Could Be as Bad for Climate as Coal, Experts Warn*. 2 July 2019. Available at: <https://www.theguardian.com/environment/2019/jul/03/booming-lng-industry-could-be-as-bad-for-climate-as-coal-experts-warn>.
- ¹⁰ See e.g. United States Environmental Protection Agency (2014). *Leak Detection and Repair: A Best Practices Guide*. Available at <https://www.epa.gov/sites/production/files/2014-02/documents/ldarguide.pdf>.
- ¹¹ European Commission (March 2017). *SIA in support of the negotiations on a Transatlantic Trade and Investment Partnership (TTIP): Final Report*. Page 478. Available at http://trade.ec.europa.eu/doclib/docs/2017/april/tradoc_155464.pdf. See also United Nations Environment Programme. *Global Environment Alert Raises Concerns About Gas Fracking*. 4 December 2012. Available at: <http://sdg.iisd.org/news/unep-global-environment-alert-raises-concerns-about-gas-fracking/>.
- ¹² See e.g. United States Environmental Protection Agency (2014). *Leak Detection and Repair: A Best Practices Guide*. Available at <https://www.epa.gov/sites/production/files/2014-02/documents/ldarguide.pdf>.
- ¹³ European Environment Agency, *Annual European Union Greenhouse Gas Inventory 1990–2017 and Inventory Report 2019*. Tables 3.106 and 3.107. Available at <https://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2019>.
- ¹⁴ Carbon Brief. *Coal Mines Emit More Methane than Oil-and-Gas Sector*. Available at: <https://www.carbonbrief.org/coal-mines-emit-more-methane-than-oil-and-gas-sector-study-finds>.
- ¹⁵ Irving, W. (USEPA) and Tailakov, O. (Russia Coalbed Methane Center) (2000), IPCC. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories: CH4 Emissions: Coal Mining and Handling*. Available at: https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_7_Coal_Mining_Handling.pdf.
- ¹⁶ See e.g. United States Environmental Protection Agency (2014). *Leak Detection and Repair: A Best Practices Guide*. Available at <https://www.epa.gov/sites/production/files/2014-02/documents/ldarguide.pdf>.
- ¹⁷ See e.g. US Energy Information Administration (website, last visited 9 March 2020). *Petroleum and Other Liquids*. Available at https://www.eia.gov/dnav/pet/pet_move_expc_a_EPL2_EEX_mdbl_a.htm.