

Options for addressing methane as an ozone precursor under the Air Convention (Gothenburg Protocol Review)

The purpose of this document is to provide information and begin a dialogue on potential ways for addressing methane as an ozone precursor under the *UNECE Air Convention*. The information presented is intended to help in the development of conclusions on further work under the Review and next steps in addressing methane as an ozone precursor. It is important that new activities that address methane under the Convention be additive and complementary, rather than duplicative of existing international efforts to achieve methane emission reductions.

A number of options are available for addressing methane under the Convention. They range in ambition level and legal status, the options presented are not exhaustive, and additional options may also exist. Discussion of these options are under the purview of the current Review of the Gothenburg Protocol in order to help inform the Review conclusions on appropriate next steps for addressing transboundary air pollution. Reducing transboundary ozone in the UNECE region is an objective of the Protocol per Article 2.1. Methane is addressed to some extent under the UNFCCC. However, since the UNFCCC is focussed on limiting global warming, methane is generally treated as interchangeable with other greenhouse gases, via conversion to carbon dioxide equivalent. Thus, the UNFCCC was not designed to take into account the health and environment benefits of methane mitigation, nor does it have quantitative commitments to focus particularly on methane as an ozone precursor.

The role of methane in ozone formation and its impact on health and environment is established in the scientific evidence from the 2016 Scientific Assessment Report,¹ its Policy Response (ECE/EB.AIR/WG.5/2017/3and Corr.1), as well as the information presented thus far in the Review, including results of the Global Methane Assessment.² Results of the Global Methane Assessment indicate that available targeted methane measures, together with additional measures that contribute to priority development goals, can simultaneously reduce human-caused methane emissions by as much as 45%, or 180 million tonnes a year (Mt/yr) by 2030. The IPCC's Report on Global Warming of 1.5°C indicates that in order to meet the minimum global effort required to limit global warming to 1.5°C over the long-term, without overshooting, emissions of methane (and black carbon) need to be reduced by 35% or more by 2050, compared to 2010 levels.³ Therefore, it is becoming increasingly relevant to address methane, both as a climate forcer and as an ozone precursor.

It is estimated that the UNECE region contributes 20% of global methane emissions. The options considered in this paper should include those that address UNECE emissions as well as those outside the region.

The discussion of this paper at the Heads of Delegation meeting in September 2022 will inform the final Review conclusions, key messages and next steps on addressing methane under the Convention.

¹ See Rob Maas and Peringe Grennfelt, eds., *Towards Cleaner Air: Scientific Assessment Report 2016* (Oslo, United Nations Economic Commission for Europe (ECE), 2016); and United States Environmental Protection Agency and Environment and Climate Change Canada, "Towards Cleaner Air: Scientific Assessment Report 2016 – North America" (2016)

² <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>

³ IPCC Report on *Global Warming of 1.5°C* <https://www.ipcc.ch/sr15/>

How methane is currently addressed through other efforts, including other MEAs

Through emission reductions

- *Global Methane Pledge (GMP)*
 - Collectively reduce global anthropogenic methane emissions across all sectors by at least 30% below 2020 levels by 2030, as well as commitments to report on emissions, policies, and mitigation strategies, and to support other international methane emissions reduction initiatives.
 - 121 countries have signed on, see table 1 below for number of LRTAP parties that have signed GMP.

- *Global Methane Alliance*
 - Reduction target of at least 45% reduction in methane emissions from the oil and gas industry by 2025 and 60% to 75% by 2030 OR Intensity-based target of “near-zero” methane emissions.
 - Goal proposed by the CCAC for oil and gas producing nations and countries to sign onto.
 - Only 2 countries have signed on to the GMA.

- *Arctic Council Expert Group on Black Carbon and Methane (EGBCM)*
 - Works to implement the Arctic Council Framework on Black Carbon and Methane, including tracking national efforts to reduce emissions of black carbon and methane within and beyond the borders of Arctic states and reports on existing and planned actions. Currently tasked with developing proposals for a more stringent post-2025 collective goal on black carbon and a potential collective methane reduction goal.
 - Arctic Council states are all Parties to the Air Convention, but not all Air Convention Parties are members of the Arctic Council.

Through capacity-building

- *Global Methane Initiative*
 - supports capacity building to increase recovery and use of methane (as well as emission reductions) with a focus on oil and gas, coal and biogas.

- *Climate and Clean Air Coalition*
 - supports capacity building for national planning and technical assistance in implementation of emission reductions in oil and gas, agriculture, and waste sectors.

Through scientific-technological cooperation

- *CLRTAP (Task Force on Hemispheric Transport of Air Pollution (HTAP)/Task Force on Integrated Assessment Modelling (TFIAM)/Centre for Integrated Assessment Modelling (CIAM))*
 - HTAP modelling and assessment of transboundary ozone based on global emission scenarios developed by CIAM/TFIAM

- *Zero Routine Flaring by 2030 (Global Gas Flaring Reduction Partnership)*
 - o an initiative by the World Bank to eliminate routine flaring of methane in oil and gas production systems.
- *International Methane Emissions Observatory*
 - o a project led by UNEP to combine nationally reported emissions, data provided by companies, and observations of atmospheric composition to inform opportunities to reduce methane emissions.
- *Methane Tracker, a project by the IEA (International Energy Association)*
 - o to track oil and gas sector methane emissions and provide regulatory guidance to reduce emissions.
- *Oil and Gas Methane Partnership (OGMP 2.0) launched by CCAC*
 - o Companies responsible for a third of global O&G production are participants, including many European companies. Companies must meet requirements on emissions data reporting and also set and show progress against methane reduction targets.
- *Emission reporting synergies with UNFCCC & the Arctic Council to minimise administrative burden, avoid duplications*
 - o UNFCCC requires reporting of emissions annually on April 15 for all years from the base year to two years prior to the current reporting year by Parties. Parties provide both tabular emissions data and a National Inventory report describing data sources and methods. All this information is publicly available on the UNFCCC website: <https://unfccc.int/ghg-inventories-annex-i-parties/2021>
 - Reporting requirements can be found here: <https://unfccc.int/sites/default/files/resource/ETFReferenceManual.pdf>

Considerations to take into account when deciding on how to address methane

Timing (taking action now versus taking action later):

- Timelines are key criteria when assessing options. The Global Methane Pledge has created a potential political window of opportunity / momentum which could support options that can be introduced relatively quickly under the Air Convention. However, it should also be considered that any selected Air Convention policy responses are unlikely to have an impact in the GMP relevant time period.
- Short-term, medium-term and long-term actions can be selected and/or combined; a step-wise approach may help to capture both the easier quick fixes and the more complicated long-term processes.
- Create linkages, leverage resources & avoid unnecessary duplication with other related MEA actions, and other legislation or global initiatives.

Geographical Scale and Ambition:

- Larger geographical scope with lower ambition level vs more narrow geographical scope with higher ambition
- Assess the potential co-benefits for addressing NH₃ emissions from agriculture

- Assess the benefits of international cooperation and coordination with other international initiatives (see below), with support of the Task Force on International Cooperation for Air Pollution
- Use of Batumi Action for Cleaner Air (BACA) voluntary commitment approach
- Other outreach options to complement Air Convention processes with actions to also address methane sources in non-UNECE regions

Potential options for how methane could be addressed

These options are provided for information only and are not exhaustive. These are not in priority order but rather presented as technical/data, reductions/abatement, and voluntary/capacity-building. Each option could be stand-alone or used in combination or as a package.

A. Status Quo:

1. Maintain current activities and take no additional action: If no action can be identified within the Gothenburg Protocol that would lead to clear, additional and complementary impact beyond that expected in Party fulfilment of the Global Methane Pledge, no action may be required or advisable.

Considerations: This is a new issue to address with a policy response under the Air Convention; Status quo does not take into account the current information on transboundary methane and its impact on ozone levels; by maintaining the current level of activities there is no risk of overlap with other fora. Some ongoing Convention activities underway by the scientific and technical bodies include work by TFHTAP on modelling and assessment of transboundary ozone based on global emission scenarios developed by CIAM/TFIAM; as well as the development of technical guidance on methane developed by TFTEI. Both TFHTAP and CIAM/TFIAM cooperate with the experts from UNFCCC, GMP and CCAC to develop methane emission and ozone projections.

Next steps: Continue current efforts and take no additional action.

B. New Measures/Commitments:

2. Support GMP Pledge: This could be adoption of a commitment, EB decision or declaration to uphold or sign on to the Global Methane Pledge: The purpose of such a measure would be to emphasize a country's GMP commitment, as well as act as a secondary mechanism of ensuring those LRTAP parties that have signed the GMP will uphold their commitment. It should also serve as a way to encourage those LRTAP parties who have not signed on to the Pledge yet, to do so. The Convention could track progress and provide technical support as resources allow.

Considerations: Out of the 51 Convention parties, 36 have joined the Pledge, representing approximately two-thirds of the total methane emitted in the UNECE. If LRTAP parties were to join the GMP, additional emission reductions could be achieved. For example, if all LRTAP Parties were to join the GMP and implement its 30% reduction target domestically, an additional reduction of ~600 Mt CO₂e⁴ would be achieved. A declaration supporting the GMP could be issued in the near-term and would not require an amendment process.

⁴ See Table 1 and footnote 5 indicating Table 1 will be updated with 2020 data.

Next steps: A decision by the Executive Body would be needed to develop the stand-alone “commitment” or declaration text which would be negotiated by Parties at a meeting of the Executive Body.

3. Adoption of national emission reduction targets or optimized national/regional methane reduction commitments: The current protocol could be revised or a new, separate protocol or other instrument could be developed. The commitments can be binding or non-binding, national or collective (focussing on low-cost measures). The measures could be mandatory or non-mandatory, or a combination of both. Any separate new amendment on methane to the Gothenburg Protocol could be incrementally ratified. Voluntary targets could be developed for individual countries or overall/region-wide.

Considerations: First individual or collective binding emission reduction commitment(s) on methane, setting an example for other regions, may include a smaller number of countries. Air pollution based targets / commitments may reduce flexibility/cost-efficiency in implementing climate change targets addressing all GHGs (policies and measures). The commitment(s) could be based on a fixed percentage reduction or optimised allocation reductions (which would lead to different commitments for each Party). Expected time to implement may be long. The risk of overlap with other fora is limited and related to collective reduction goals on GHGs.

Next steps: If (a) binding goal(s) is/are chosen, a revision of the Gothenburg Protocol would be needed. If a new agreement or protocol is decided, a negotiation process to develop the new agreement would need to be launched.

4. Methane emission limit values for certain activities: Different requirements would be needed for each key sector. A new technical annex could be developed that would include emission limits & best practices/ best available technologies.

Considerations: Technical annexes could be based on guidance document on methane developed by TFTEI, however technical annexes could be too stringent or result in barriers to implementation. Key sources of methane differ between subregions of UNECE area: uniform requirements on all methane producing activities may be less cost-effective to achieve certain emission reductions. Flexibility mechanisms to avoid the creation of disproportionate ratification barriers would be needed like for example to allow joint implementation of methane obligations by Parties. The expected time to implement may be long-term.

Next steps: Depending on if emission limit values are binding or added via an annex to the Protocol, negotiations to revise the Gothenburg Protocol would need to be launched.

C. Information-Based (through technical work included in the Air Convention’s workplan(s) or through requirements in a legal instrument)

5. Compiling, reviewing and improving methane emissions information: Duplication of efforts and inconsistencies with UNFCCC reporting should be avoided. This could result in creation of shareable database across MEAs.

Considerations: Access to additional data for scientific and technical analysis; in order to undertake this work there is a need for additional resources/expertise in the Convention; expected time to implement may be long-term.

Next steps: A decision by the Executive Body that would request that EMEP/WGE develop a plan for improving methane information and request that task forces and centres begin work on reaching out to their climate counterparts to seek out opportunities to share information.

6. Minimum requirements for monitoring and reporting of data: Issues could include additional requirements that are not yet reported under UNFCCC, for example, additional monitoring (including remote monitoring not yet underway) for methane leaks, etc.

Considerations: Access to (new/additional) data may be challenging; expertise would be required for the verification of emission trends; higher risk for the potential for duplication of efforts under UNFCCC.

Next steps: A decision by the Executive Body would be needed to request EMEP/WGE to begin this work and add it to the Convention's workplan.

7. Development of guidance documents and/or a report on recommendations for methane emission reduction measures or best practices for sectors that could include best available control technologies and control measures (technical and non-technical) for UNECE region and for use globally: Sector-specific approaches could be used to target key sources most efficiently while also taking into account complementarities with other fora. This is similar to what has been presented in option 3 but does not require commitments of ELVs or required technical annexes. It is information-based. Considerations such as combining non-methane volatile organic compounds with methane could be included here. There is potential for allowing for pollutant swapping in order to increase cost-effectiveness of ozone abatement.

Considerations: Expected time to implement would be medium-term; there is potential for some limited overlap with other documents that are being prepared by other fora like the IPCC or IMEO, EIPPCB (European Integrated Pollution Prevention and Control Bureau).

Next steps: To develop guidance documents or other reports, a decision would be required by the Executive Body to request EMEP/WGE to undertake this work and add it to the workplan of the Convention.

D. Voluntary-Based

8. Voluntary programs (such as BACA): Countries (not only Parties to the Convention) would be given the opportunity to globally pledge to undertake actions on methane that they have committed to doing and complete them; this would act as a sort-of “check” on domestic commitments made by countries. For example, “commitments” could be made on agricultural best practices, consumer outreach, industry trade groups, behavioural and non-technical measures (could include guidance documents from Option 6; promotion campaigns and or voluntary pledges).

Considerations: Could leverage resources with other initiatives with voluntary programs addressing methane and ozone, higher risk of potential for duplication of efforts under GMI or CCAC; monitoring would be needed; expected time to implement could be within a five-year time frame (shorter term) like BACA; could be broader than UNECE region.

Next steps: A decision by the Executive Body would be needed to launch negotiations to develop a voluntary program that could be administered by the Convention.

9. Capacity building programs, especially in Eastern Europe and Central Asia and Turkey: This could be supplemental efforts to support efforts under GMI, CCAC and could be coordinated through/with the Forum (Task Force on International Cooperation on Air Pollution).

Considerations: Could apply resources directly to a country or a sector and achieve emission reductions quicker; could imply a commitment for Parties to make additional efforts to reduce methane emissions; risk of potential overlap with existing efforts under GMI or CCAC (depending on how this is coordinated, this could be a pro or a con); may require additional resources (funding); expected time to implement could be in the shorter term.

Next steps: A decision by the Executive Body would be needed to undertake this work. If TFICAP is expected to undertake some of this work, discussions with TFICAP co-chairs would be needed to determine capacity and whether changes to their mandate would be needed.

Draft Key Message

Methane contribution to transboundary ozone is significant enough to take policy action under the Air Convention.

Draft Recommendation

The current work underway on methane as an ozone precursor by a number of scientific and technical bodies of the Air Convention should continue.

The Working Group on Strategies and Review should add to their 2022-2023 workplan to undertake continued discussions on the appropriate policy mechanism by which to achieve methane reductions for the purposes of reducing ozone.

Table 1:⁵

Methane Emissions by LRTAP, GMP Countries				
Parties to the LRTAP Convention	GMP Signatory? 1 - Yes/0 - No	Total methane emissions, in tonnes CO ₂ equivalent	Total methane emissions by GMP signatories, in tonnes CO ₂ equivalent	
Albania	1	3,160,000	3,160,000	
Armenia	1	2,430,000	2,430,000	
Austria	0	6,218,000	0	
Azerbaijan	0	43,600,000	0	
Belarus	0	15,762,000	0	
Belgium	1	7,265,000	7,265,000	
Bosnia & Herzegovina	1	3,380,000	3,380,000	
Bulgaria	1	6,259,000	6,259,000	
Canada	1	98,384,000	98,384,000	
Croatia	1	3,560,000	3,560,000	
Cyprus	1	890,000	890,000	
Czechia	0	12,476,000	0	
Denmark	1	7,453,000	7,453,000	
Estonia	1	1,183,000	1,183,000	
Finland	1	5,258,000	5,258,000	
France	1	57,690,000	57,690,000	
Georgia	1	5,210,000	5,210,000	
Germany	1	51,146,000	51,146,000	
Greece	1	10,138,000	10,138,000	
Hungary	0	8,254,000	0	
Iceland	1	3,956,000	3,956,000	
Ireland	1	15,156,000	15,156,000	
Italy	1	43,148,000	43,148,000	
Kazakhstan	0	39,920,000	0	
Kyrgyzstan	1	4,990,000	4,990,000	
Latvia	0	2,573,000	0	
Liechtenstein	1	20,000	20,000	
Lithuania	0	2,953,000	0	
Luxembourg	1	582,000	582,000	
Malta	1	202,000	202,000	
Moldova	0	3,310,000	0	
Monaco	1	1,000	1,000	
Montenegro	1	820,000	820,000	
Netherlands	1	17,217,000	17,217,000	
North Macedonia	1	2,520,000	2,520,000	
Norway	1	4,727,000	4,727,000	
Poland	0	45,301,000	0	
Portugal	1	9,269,000	9,269,000	
Romania	0	22,938,000	0	
Russian Federation	0	340,787,000	0	
Serbia	1	12,400,000	12,400,000	
Slovakia	0	3,329,000	0	
Slovenia	1	1,924,000	1,924,000	
Spain	1	38,645,000	38,645,000	
Sweden	1	4,659,000	4,659,000	
Switzerland	1	4,685,000	4,685,000	
Turkey	0	60,312,000	0	
Ukraine	1	69,798,000	69,798,000	
United Kingdom	1	54,398,000	54,398,000	
United States of America	1	673,509,000	673,509,000	
Total:		1,833,765,000	1,226,032,000	
European Union	1	439,148,000	439,148,000	

Source: CH₄ total with LULUCF, in kt CO₂ equivalent, UNFCCC, 2019. https://di.unfccc.int/time_series
 **Source for: Albania, Armenia, Azerbaijan, Bosnia & Herzegovina, Georgia, Kyrgyzstan, Moldova, Montenegro, North Macedonia, and Serbia = Methane emissions (kt CO₂ equivalent), World Bank/Climate Watch, 2018. <https://data.worldbank.org/indicator/EN.ATM.METH.KT.CE>
 ***EU is a party to LRTAP and a GMP signatory, however total EU methane emissions are not included in the total for all countries (instead each separate EU member state is listed)

⁵ This table will be updated with the latest 2020 data from UNFCCC for the 42nd session of the Executive Body.