

UNECE Convention on Long Range Transboundary Air Pollution

Options for the Control of Particulate Matter Under the Convention: a note by the Co-chairs of the Expert Group on Particulate Matter

Introduction

1. The report of the Expert Group on Particulate Matter was presented to the 40th session of the Working Group on Strategies and Review (WGSR). The report included a review of options for control of particulate matter (PM) under the Convention, describing each in broad terms and objectively discussing the main defining characteristics. Making recommendations on the option and the ways in which it should be pursued was beyond the remit of the Expert Group.
2. At its 25th Session the Executive Body (EB) invited the lead countries of the Expert Group, Germany and the United Kingdom to explore from a policy perspective options for addressing PM under the Convention, and to propose options that could be further explored by the Expert Group, and to report to the 41st session of WGSR.
3. This paper outlines the views of the co-chairs of the group. There will be many other viewpoints. Only policy bodies under the Convention can decide the priorities and strategies for negotiation and thus the PM control options to be pursued.

Options for addressing PM under CLRTAP

4. The following options were explored by the Expert Group for addressing additional abatement of primary and precursor PM emissions under the Convention:
 - (i) Initiatives to increase the number of Parties to the Protocols;
 - (ii) Technological measures using emission limit values (ELVs), and/or best available techniques (BAT);

- (iii) Non-technical measures (e.g. economic instruments);
 - (iv) National emission ceilings (NECs) not to be exceeded at a future date (these can be expressed as either absolute numbers or percentage reductions relating to a base year);
 - (v) Sector targets (national; for sub-regions; explicit per sector; excluding sectors)
 - (vi) Ambient air standards for PM to be met at a future date (absolute concentration and/or percentage reductions in average concentrations with reference to a base year).
5. Most options involve a variety of trade-offs between the desires for controls to be effects-based and not to distort competition (delivering a level playing field). There can also be a trade-off between flexibility in approach (allowing Parties to determine how best to meet their obligations) and regulatory certainty (reducing flexibility, but making compliance more transparent).
 6. Achieving an optimum strategy for PM reduction is likely to involve a combination of several control options. Some options are difficult to implement under the Convention but could significantly contribute to reducing PM exposure on a national scale.
 7. The Expert Group found that PM causes substantial adverse health effects where premature deaths can primarily be attributed to the fine fraction (PM_{2.5}), but that there are also significant health effects associated with PM_{coarse} (PM_{2.5-10}).
 8. The Expert Group concluded that PM_{2.5} concentrations can be cost-effectively reduced in the Convention area on the basis of a common harmonised abatement strategy. It noted that PM_{coarse} has a smaller, but still significant, long range component and could also be controlled in this way.

Views of the Co-chairs

9. The following sections outline the views of the co-chairs on the different options to pursue in any new instrument to further control PM under the Convention, together with suggestions for how the options could be developed using existing

Convention bodies. These sections have not been discussed with the Expert Group.

10. Discussion of the appropriate implementation route was beyond the remit of the Expert Group, so their report was neutral on whether new provisions on PM should be implemented through revision of existing Protocols (Gothenburg and/or Heavy Metals) or through a new Protocol aimed specifically at PM. It would appear that a consensus is developing that a revision of the Gothenburg Protocol is the most appropriate vehicle. Indeed this paper is due to be discussed under that agenda item at the 41st WGSR.
11. We agree with this option. The current Gothenburg Protocol already regulates PM precursors, and pursuing a single instrument to address PM and its precursors seems to us a more sensible option than splitting obligations (and therefore ratifications) over two separate instruments. Addressing PM in only one Protocol will deliver greater clarity on the obligations of Parties. We also believe that using a revision of the Gothenburg Protocol is also preferable to a new Protocol aimed specifically at PM. Aside from the clear preference expressed at the Belgrade Ministerial Environment for Europe conference for no new environmental instruments, we think that it makes more sense to retain the multi-pollutant, multi-effect concept embodied in the Gothenburg Protocol.

Increasing the Number of Parties

Recommendation:

12. Before addressing PM in any revised instrument the EB needs to decide on the following options:
 - (a) a reduction in either the technical complexity of the annexes or the mandatory nature of some of the obligations for all Parties compared to previous Protocols;
 - (b) an acceptance that some obligations in the new instrument will apply to, or be mandatory in, only some Parties;

- (c) an acceptance by EU and North American Parties that they are prepared to negotiate ceilings or other obligations that are more stringent than their current or planned internal laws and policies.

Rationale:

13. Modelling has shown that increasing the degree of implementation of existing Protocols, as well as reducing health impacts in the non-Parties concerned, would also be more cost-effective to the Convention as a whole than existing Parties undertaking additional controls.
14. Any new instrument should be designed with the aim of maximising implementation. It should be obvious that a Protocol which merely reflects existing EU and North American legislation that is ratified only by EU and EFTA Member States and North American Parties is of limited benefit.

Technological measures

Recommendation:

15. Controls on specific point emission sources within any new instrument should be based on a simple obligation to apply the principles of BAT, backed up by separate (and updatable) guidance documents defining best practice. Reporting obligations should include a list of controlled sites and duty to report deviations from the guidance including an explanation of their rationale.
16. Opportunities to include annexes that harmonise emission limit values for smaller sources of PM, such as vehicle emission standards, should be investigated. But this should only be undertaken if there is a real prospect of reducing real world emissions as a result.
17. Technological measures should focus on emissions with a significant transboundary character regardless of whether they contribute to PM_{2.5} or PM_{coarse}.

Rationale:

18. Technological measures can be specified in a Protocol primarily in two ways: limit values for emissions (ELVs) and the application of Best Available Techniques (BAT).
19. While ELVs represent a clear limit for regulators, their inclusion in Protocols greatly increases the complexity of those. ELVs can only be amended by revision of the Protocol. The subsequent ratification procedure for the amendments is not a trivial task and can lead to confusion over which Parties have ratified which versions of the Protocol. ELVs thus fix the ambition level to that achievable by techniques readily available at the time of the negotiations.
20. A different approach to technological measures is through the application of Best Available Techniques (BAT). In this instance Protocols do not define installation-specific emission limits, but instead confer a duty to control the emissions from installations (often through the application of locally determined ELVs) taking into account guidance adopted by the EB.
21. Therefore BAT is more flexible than universal ELVs relying on guidance documents to define best practice. Updating the guidance need not involve amendment to the Protocol and is therefore easier to achieve than altering fixed ELVs. So the definition of BAT for any given process can develop over time, responding to advances in technology.

Non-technical measures

Recommendation:

22. Any new instrument should include an obligation to report descriptions of non-technical measures adopted within Parties. However, the measures themselves should not be made mandatory.

Rationale:

23. Non-technical measures undoubtedly have an important role in reducing direct emissions of PM and its precursors. But their character means that it is difficult to see how their adoption could be made mandatory. Reporting such measures and

including them in a toolkit should maximise awareness of successful approaches without trespassing on the rights of Parties to determine their own fiscal policies.

National emission ceilings (NECs) not to be exceeded at a future date

Recommendation:

24. Specify emission ceilings on a national basis for primary PM_{2.5} in terms of a percentage reduction in annual emissions against a base year. Set emission ceilings on a national basis for the main precursors of secondary PM_{2.5} defined as annual tonnages.

Rationale:

25. Specifying emission ceilings on the basis of multi-pollutant, multi-effect integrated assessment modelling is a well established method of reducing PM precursors under the Convention. GAINS has demonstrated its ability to also incorporate primary PM into this modelling, although there are concerns that its importance can be under-estimated due to a combination of its relatively short atmospheric range and the spatial resolution of the dispersion modelling. GAINS can also now explore synergies and trade-offs between the control of local and regional air pollution and the mitigation of global greenhouse gas emissions.

26. Emission ceilings targets can be expressed in different ways. The Gothenburg Protocol uses annual tonnages¹, and there seems no need to move away from such an approach for the pollutants it addresses (which are all precursors of secondary PM). Emission inventories of PM precursor substances are in general considered sufficiently reliable, but may need improvement in some European non-EU countries.

27. However, inventories of primary PM emissions are still relatively uncertain. Therefore it would seem prudent to specify any new primary PM ceiling in terms of a percentage reduction. Such an approach is more robust to developments in

¹ The Protocol also includes the concept of Pollutant Emissions Management Areas (PEMA), allowing the largest Parties to focus their abatement efforts in particular parts of their territories.

the methods for calculating inventories, as the base year total is also recalculated. Percentage reductions are likely to result in a closer match between the intended and actual degree of effort required by a Party to meet its obligations. They are also more transparent, showing which Parties have the most reductions.

28. Another possible approach would be to retain emission ceilings for all pollutants covered by the new instrument, but allow adjustments to them in the light of methodological changes to the inventories. This option would require explicit emission totals for the base year and the target year and a mechanism to adjust them. While this is appealing from a technical point of view, we do not recommend this approach as we believe it would be too difficult and time consuming to operate.

Sector targets

Recommendation:

29. Sectoral emissions ceilings and emission trading between Parties are not recommended.

Rationale:

30. Sectoral emission ceilings would define targets for a particular industrial sector across more than one Party. Such an approach raises serious compliance issues (who would be held to account for a failure to meet an obligation?) and would introduce considerable complexity if combined with national emission ceilings.
31. Emission trading between Parties or regions would lead to environmental benefits also effectively being traded at the same time. To avoid unintended environmental outcomes any such trading would need to be limited in magnitude or geographical scope. Currently there are no sufficient criteria available to define such limits.

Ambient air quality targets

Recommendation:

32. It is not considered reasonable to set any common ambient air standard for PM_{2.5} or PM_{coarse}. Instead an approach using the concept of PM_{2.5} exposure reduction is considered worth pursuing in the longer term.

Rationale:

33. The Expert Group report suggested that no common ambient air standard could be defined which is both achievable by all Parties and at the same time requires improvement by all. However, it outlined an approach using the concept of exposure reduction that could potentially be informed by integrated assessment modelling techniques. It stated that the robustness of such an approach would depend on improved: model resolution; modelled urban increments (requiring better urban scale emission inventories); and expanded PM_{2.5} monitoring in highly populated areas.

34. We are not convinced that existing knowledge would allow development of robust exposure reduction targets across the Convention area at present. The additional complexity such an approach would introduce to a Convention Protocol seems a step too far for now.

Further work and conclusions

35. We believe that increasing the number of Parties is a key part of any successful attempt to reduce PM in the Convention area. There needs to be an urgent review of the real appetite within Parties for the possible approaches to achieving that outcome (see paragraph 12). This highly politically sensitive task would best be undertaken by the Secretariat and the Bureaux of the EB and WGSR. This should also consider the impact each of these approaches would have on the environmental and human health benefits that are the rationale for the Convention.

36. We consider it important that the emissions of primary PM_{2.5} and PM_{coarse} as well as precursors of secondary PM_{2.5} are addressed in a new or revised instrument under the Convention. The Expert Group has outlined the options by which this could be done and discussed the main characteristics of each option.

37. It seems to the co-chairs that whatever the decisions of the EB are going to be, they are likely to be best taken forward by other existing groups within the Convention, e.g. Task Force on Integrated Assessment Modelling (TFIAM), Expert Group on Techno-Economic Issues (EGTEI), Task Force on Emission Inventories and Projections (TFEIP), Task Force on Health (TFH), etc. This is necessary to ensure a consistent and holistic multi-pollutant, multi-effect approach within the revised Protocol. It is not clear to us that there is a continuing need for an Expert Group on Particulate Matter.
38. In particular it seems to us that any attempt to devise relevant annexes and guidance for technological measures should be delegated to EGTEI, as the Convention body with the most relevant expertise. Much of the necessary work is already in EGTEI's workplan. It would also be given the longer term task of drafting updated guidance for discussion at WGSR and agreement at the EB.
39. All GAINS modelling work aiming to propose new ceilings for a revised Gothenburg Protocol should at the same time consider the reduction of primary and secondary PM_{2.5} on human health. It should also aim to propose a percentage reduction in annual national emissions of primary PM_{2.5}.
40. We recommend that the relevant EMEP technical bodies (TFMM, TFEIP, TFIAM) should be tasked with developing the exposure reduction approach so that it could be incorporated into Convention instruments in the medium to long term.
41. In performing these tasks the findings and recommendations of the full report of the Expert Group² should be considered.

² See <http://www.unece.org/env/wgs/070905%20PMEG%20-%20Final%20report.pdf>