

Introduction

Air pollution and climate change are intertwined at many levels. They are often driven by common sources, share reactions to specific substances and interact within the same atmosphere. Nevertheless this connection does not yet extend sufficiently into the policy arena, and in this respect there is the potential for suboptimal strategies to evolve. Implementation of the aspirational targets for climate control (the 2 degree-target) could offer considerable co-benefits for air pollution, provided that technologies that would create additional air pollution (e.g. woodstoves, 1st generation biofuels and CCS) are avoided. Similarly, transboundary air pollution control can lead to co-benefits in the context of climate ambitions. Ultimately it depends somewhat on the perspective of the policymaker and ideally this should be changed such that the perspective encompasses both areas in an integrated fashion. Such integration is important not only for fully informed decision making, but also because a failure to consider the extended implications of policy actions may lead not only to a loss of co-benefits, but additional cost from policies with damaging outcomes to one of the two fields.

Within this intertwined framework, cost benefit analysis can be a useful tool to evaluate, in a holistic manner, the valued impacts of policies and measures. However, in assessing the cost and benefits of climate and air policies together, the boundaries for considerations can be drawn quite broadly. Economic feedback mechanisms, the role of short lived climate forcers, trade-offs, co-benefits, discount rates and relative pricing are just some of the considerations that present themselves.

The manifold and urgent environmental management challenges facing the world add pressure to research and policy. The interface between these two is important, and cost benefit and related evaluation methodologies have a role to play in guiding policies. There is complexity and uncertainty, but there is pressure on decisions and actions will be taken.

In this context the principle aims of this workshop were:

- To identify the considerations of cost and benefit estimation and to move towards agreement over best practice (e.g. balancing data requirements with sufficient scope)
- To discuss specifically some of the considerations associated with modelling of costs and benefits from combined policies

The session included presentations from Kelly, Maas and Holland and a reasonable portion of time was devoted to building a discussion matrix of 'category end-points' (e.g. health, risks) – and disaggregated components related to these (e.g. vector borne diseases, PM related health issues or fire and flood risk) that could be considerations of broad integrated CB analysis of air and climate policy outcomes.

The working group also tried to touch on the following questions:

- How to assess cost and benefits in both areas?
- How to include this into the related policy modelling processes?
- Are the boundaries wide enough for cost and benefit considerations?
- What are the barriers to implementation of seemingly CB approved options? Agency problems?

Further points or raised topics included the following. Some were linked to ultimate conclusions and recommendations to the meeting:

- The importance of integration of equity into CB frameworks
- The balance between rigorous complexity and practical simplicity in the boundaries for CB analyses.
- The potential for short-term policies to discourage long-term vision e.g. refit vs. decommission
- The importance of addressing and communicating uncertainties in research outcomes
- The relevance of economic and biogeochemical feedbacks and so forth.
- Identification of the issues with valuation of impacts/benefits for some components e.g. biodiversity
- The relevance of include indoor air quality to valuations on health – particularly in developing world.
- Examples of managing AQ in terms of longer term CC policies. Transition plans and visions.
- The importance of other evaluation mechanisms for decision makers – MCA, CGE modelling
- Importance of considering opportunity costs in decision making. Not hiding trade-offs entirely with monetary valuations. Provide detail.
- Cost-effectiveness vs. efficiency

Conclusions - Findings

- The full integrated assessment of impacts from emissions of both air pollutants and greenhouse gases is extremely challenging. CBA and other evaluation techniques can play an important role in supporting intermediate air & climate policy making.
- Health (e.g. AP related health impacts, heat stress and vector borne diseases), food risks (e.g. temperature, global dimming and ozone) and water availability (e.g. ice melting, floods and droughts) are likely to make up the greatest part of the effects within AQ and CC over the next 20 years.
- Biodiversity effects are more challenging to value in monetary terms but are an indispensable part of the framework to support decision takers.
- The choice of temporal and spatial boundaries, atmospheric and biogeochemical responses, and economic feedback mechanisms can dramatically change cost-benefit results.
- Costs from behavioural change are difficult to value. It is also complicated to know the real barriers to implementation of low cost measures (e.g. structural and behavioural).
- One way of linking air and climate policies is to focus on the short-term climate impacts from air pollutant reductions.
- Ambiguity in the presentation of results and recommendations from the science community is understandable given the complexities. However, this can limit the value of results to the policy making process.
- Clear vision of intermediate and long term air & climate targets and measures from policymakers would aid the scientific community in structuring their research priorities.
- There are specific examples of policymakers devolving some political power to scientific community in well defined areas of research (e.g. central banks, fisheries).
- Geoengineering is relevant in the cost-benefit debate. An apparent low cost opportunity to address global issues must raise important questions with regard to governance (i.e. who decides if action can or should be taken?).

Recommendations

A) Cost-benefit

1. In the evaluation framework in addition to current CBA knowledge, consider (at least qualitatively) broader health effects, food risks, social migration, water availability and biodiversity. Recommendation to consider studies on value of additional information from the research community. Utilise to target research priorities.
2. As current cost benefit techniques as applied in AP policy in Europe have limitations:
 - Non-monetary metrics (e.g. biodiversity indicators, GWP) and other methodologies such as MCA can be used to supplement policy making advice
 - CBA or MCA should consider temporal and spatial boundaries, atmospheric and biogeochemical responses, and economic feedback mechanisms
 - For broader and longer term policy plans alternate evaluation techniques such as CGE should be used.
3. Research should focus on cost estimation and implementation of structural and behavioural measures (taxation, elasticities, barriers for their implementation, agency problems etc.)
4. CBA research should also take into account the short term climate effect of air quality policies. Currently the climate related impacts of tackling these short lived species are not captured in CBA – e.g. ambitious sulphur measures require further analysis.

B) Air-Climate linkage

5. Scientists should be more conscious of the information relevant to the policy process. Results should be accompanied by both uncertainty analysis and recommendations. These may include meaningful indicators and ideas on how to deal with uncertainty in the policy process.
6. Policymakers should support the integration of air and climate research by bridging the respective short and long term focus of policies. This includes a vision of coordinated intermediate and long term targets and measures for both air pollution and climate change.

C) Organization

7. Create/include a global atmosphere convention as a framework for the management of the atmosphere (coherent air and climate policy)
8. Incorporate CBA discussion in task forces or working groups (TFIAM/IPCC)