

# **APPENDIX**

## **STRATEGIES FOR CLEAN AIR AND HEALTH**

### **Rome Conference Statement**

**Summary of Delegate and Planning Committee Comments**

**on**

**Draft Final and Draft Version 1 and 2**

**Rome Conference Statements and Responses**

## SUMMARY OF PLANNING COMMITTEE COMMENTS ON DRAFT FINAL CONFERENCE STATEMENT

Statement Section	Comment	Response
<b>General comments</b>	Please add a text box up front defining what the "conference statement" is meant to do. Include a very prominent disclaimer (i.e., not a footnote!) that the wide range of opinions expressed by participants in this colloquium is NOT represented in the conference statement, and it is NOT a consensus document. In addition, there should be a prominent reference to an appendix containing the ENTIRE range of comments submitted.	A Preamble has been added to define the objective of the Statement and the process used in its development. The Preamble clearly states that the document is not a consensus document and all comments submitted are available in an Appendix to illustrate the full range of stakeholder views.
<b>Statement 1</b>	Thanks for incorporating my previous comments. I liked your last version, but do agree that available evidence points to both PM2.5 and PM10.	The statement has been revised as follows to further emphasize that health effects are associated with both PM2.5 and PM10.  <i>However, there is now a substantial body of evidence to show that PM10 and PM2.5 are associated with adverse health effects in airways and lungs and the cardiovascular system. These particles, to which PM2.5 forms a major constituent, originate i) directly from combustion and industrial processes, such as from large point sources like coal-fired power plants and steel mills, and from area and mobile sources such as vehicles and ii) indirectly through the complex atmospheric formation of secondary particles from precursor gases.</i>
	air pollution is responsible for 1.4% of all deaths (Cohen et al., 2003). <b>CONFIRM 1.4% OF ALL DEATHS</b>	This number has been confirmed with the lead author.
	PM is considered as <del>DELETED</del> <b>CONSIDERED AS</b> a very complex mixture and its chemical and physical composition varies over time	Test has been deleted as suggested.
	My main point of concern is the statement on PM2.5 in subchapter 1 on on page 2 , and I do not agree with the way it is written now. See my suggestions (below) to "bridge the gap" and to change the wording in trying to balance it with the available scientific evidence and general views. ----- <u>I DO NOT AGREE WITH THE NEXT (TOO) FIRM STATEMENT. IT IS TOO MUCH NARROWED TO PREDOMINANTLY ADVOCATE PM2.5. AND IF FACT</u>	The proposed changes indicated in bold text have been made. The statement now reads as indicated in the response to the first comment in Statement 1.

Statement Section	Comment	Response
	<p>WE ARE EVEN QUITE LIMITED IN OUR ABILITY TO CREATE A SOUND HEALTH EFFECTS DATABASE ON PM2.5 TO BUILD AN QUANTITATIVE IMPACT ASSESSMENT ON!!) .I SUGGEST THEREFORE the FOLLOWING CHANGES: However, there is now a <b>substantial body of evidence that shows that PM10 and PM2.5 are associated with</b> adverse health <b>effects in airways and lungs and the</b> cardiovascular system, . <b>These particles, to which PM2.5 forms a major constituent, originate</b> i) directly from combustion and industrial processes, such as from large point sources like coal-fired power plants and steel mills, and from area and mobile sources such as vehicles and ii) indirectly through the complex atmospheric formation of secondary particles from precursor gases.</p>	
	<p>Conference statement #1 is a "showstopper" for me, as it exaggerates the public health significance of PM (see my suggestions on drafts #1 and # 2). Gases like ozone receive short shrift. The addition of the Cohen reference brings more apparent precision and objectivity to the statement, but the ESTIMATE that air pollution accounts for 1.4% of all deaths probably contains some variability that is omitted. There are big differences in what is known about PM10, PM2.5 and ultrafines based on huge differences in available data, so the attribution of health effects to specific sources or types of PM is probably premature. While conference participants did support future prioritized cost-effective actions to reduce air pollution in affected airsheds, and while PM seems to be the most consistent "signal" in those studies finding associations between poor air quality and health effects, we all have some VERY different ideas about the relative public health importance of different types of PM (sizes, composition, sources, etc.) and gaseous air contaminants. For this reason, I want the NERAM record to clearly reflect that I do not agree with the final draft conference statement. I suspect there may be others, however few.</p>	<p>The intent of the last circulation of the draft final statement was to be sure there were no typos and no fatal flaws. The intent was not to open up the document for more post conference tweaking, since there had been two previous rounds and there is always the danger of changing the conference results. The main issue raised in your comment has been represented in the conference documents, the statement, and the comments on the statement. It is clearly one of the main issues in the whole area, but also one that was front and center at the conference and in the discussions. The Appendix represents the complete list of comments and the changes made in the conference statement, in order to show the wide range of views, and to suggest how views on the statement might shift according to different perspectives, as well as to outline the protocol used and the reasons for modifications to the statement. However, the conference statement is the statement that emerged from the process of the conference, a process that was identified before the conference and followed to the best of NERAM's ability.</p>
<p><b>Statement 2</b></p>	<p>Tier II <b>EXPLAIN TIER II?</b></p>	<p>Tier 2 is explained in a footnote.</p>

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	<ul style="list-style-type: none"> <li>Adopt a risk-based approach to quantitative impact assessment and policy development considering predicted effectiveness and its <b>uncertainties, possible</b> benefits and costs, and implementation time and feasibility.</li> </ul>	Text has been revised as follows: <ul style="list-style-type: none"> <li>Adopt a risk-based approach to quantitative impact assessment and policy development considering predicted effectiveness and its uncertainties, estimated benefits and costs, and implementation time and feasibility.</li> </ul>
<b>Statement 4</b>	CONSORT process <b>WILL THIS BE KNOWN TO EVERYONE?</b>	Consort is explained in a footnote.
	4. Improve Communication among Scientists, Policy Makers, and <b>Stakeholders</b> and the Public	Term Stakeholders has been added
<b>Statement 5</b>	5. Use <b>Exposure</b> and Health Impact Assessments to <b>Address Benefits of Implemented and Future Regulations</b> and Interventions	Statement has been revised as follows: <ul style="list-style-type: none"> <li>Use Exposure and Health Impact Assessments to Assess Benefits of Implemented and Future Regulations and to Develop Interventions</li> </ul>

**SUMMARY OF DELEGATE AND PLANNING COMMITTEE COMMENTS  
ON DRAFT 2 CONFERENCE STATEMENT**

<b>Statement Section</b>	<b>Comment</b>	<b>Response</b>
<b>General comments</b>	<p>With all the inputs from people on PM, the section now comes across unbalanced - the conference said "mustn't forget <b>ultrafine PM</b>" that it could be serious but relatively little info - but it's come through as a possible extra. Also <b>NGOs</b> were missed out; likewise <b>Health Impact Assessment</b> which is a cornerstone of EU/WHO policy. So I attach my suggestions on how to include them.</p>	<p>Statement 1 addressing ultrafine PM has been strengthened as follows: <i>The health effects associated with exposure to ultrafine (UF) particles (&lt;0.1 μm) continue to be a high research priority because bio-medical toxicology has discovered potentially important adverse reaction pathways, although specific UF epidemiology studies have been rather limited. Ultrafine particles from combustion processes, particularly vehicle engines, reach levels in urban streets, homes and workplaces and may have adverse effects for public health.</i></p> <p>Ken Ogilvie of Pollution Probe stated in his keynote address that NGOs differ greatly in their philosophies and operating styles and can simplify and present science to the public via the media in ways that can be dramatic (and sometimes quite unscientific). Statement 3 now indicates that the science community should engage NGOs to ensure that science is understood and appropriately communicated to the public. The need for accurate communication and open debate is identified.</p> <p>The role of Health Impact Assessment is recognized in Statement 4 as follows: <i>The use of these ex ante policy analysis tools and broader Health Impact Assessment methodology should assist in the fair and reasonable treatment of risk factors, including exposure, measurement of PM and gaseous pollutants, special susceptibility of population sub groups, and degree of certainty.</i></p>
	<p>I still felt that draft # 2 greatly exaggerated the risks of PM2.5 and failed to acknowledge the loss of statistical significance or just our ignorance of the shape of the dose response curve at low doses. In addition, the evidence I've seen about the greater potency of combustion PM vs other sources is still relatively new and limited; therefore, it should not be overstated. Observations that have been repeated over time and geography may suggest a level of "consistency" within the methodology that is being employed, in this case, epidemiology studies of ecological</p>	<p>The statement has been revised to strengthen the emphasis on emerging studies which indicate coarse particles may be associated with excess mortality at least in some locations and that interventions should target the coarse fraction in these particular locations. Conclusions stated in the draft USEPA PM criteria document (June 2003) "<i>The set of results from the above factor analysis do not yet allow one to identify with great</i></p>

Statement Section	Comment	Response
	design; and I suggest making that more explicit.	<i>certainty a clear set of specific high-risk chemical components of PM. Nevertheless, some commonalities across the studies seem to highlight the likely importance of mobile source and other fuel combustion emissions (and apparent lesser importance of crustal particles) as contributing to increased total or cardiorespiratory mortality"</i> support the view expressed at the conference and the statement.
	it's a lot better than the previous draft, but i still find it tends to be too strident. as you saw in the paper by Koop, there are still some fundamental issues that need to be addressed, and i am concerned that they are overlooked by many proponents. my proposed additions about public health significance are meant to keep that avenue open	The statement now reflects the view expressed in one break out group that public health expenditures on air quality management should be made carefully to reflect broader evaluation of public health issues and priorities
<b>Intro paragraph</b>	certainly Francesco's institute was very supportive and we should mention that as being the host of the meeting; so Dr. Francesco Forastiere, Rome Health Authority)	Rome E Health Authority has been identified among the sponsors of the event (wording of the acknowledgment has been approved by Dr. Forastiere)
	After having brought together scientists, stakeholders and policy makers at its first Annual AIRNET Conference (London 2002), the Statement of this 2003 second conference will provide a focus for AIRNET by better functioning as a platform and forum for the science-policy-stakeholder interplay and the working group activities and content of its end-reports. This better tailored and end-user needs-driven interplay will also set the stage for the final Annual AIRNET 2004 Conference (Prague) addressing science and policy communication issues on air pollution and health.	This text has been added with minor edits to the introduction.
<b>Statement 1</b>	There is now a large degree of certainty that health impacts are associated with the fine particle portion ( $\leq$ PM <sub>2.5</sub> and below) originating i) directly from combustion and industrial processes, such as from point sources like power plants using solid or liquid fuels and steel mills, and from area and mobile sources such as vehicles and ii) secondarily through the formation of secondary particles from gases. (Comment: A considerable part of the emissions from still mills are not combustion related but rather process related.	The words in bold text have been added to the Statement.
	1. Air Pollution is an Important <b>Local, National and</b> Global Public Health Concern	Text in bold has been added to title and paragraph below.
	<b>PM is considered as a very complex mixture and its chemical and</b>	The statement has been revised as follows:

Statement Section	Comment	Response
	<p><b>physical composition varies over time and seems dependent upon meteorological and long-range transport conditions and specific source contributions. Nevertheless there are numerous studies showing that health effects are associated with a mass metric of PM, indicated by PM<sub>10</sub> and PM<sub>2.5</sub>. These PM mass fractions</b> originate i) directly from combustion processes, such as from large point sources like coal-fired power plants and steel mills, and from area and mobile sources such as vehicles ii) secondarily through the formation of secondary particles from gases, and <b>iii) from wind blown dust, resuspended road dust and mechanical wearing processes</b> These <b>various</b> source emissions should be a priority for risk reduction in affected airsheds. <b>Although the scientific information is rather limited to make firm statements, some health effects evaluations suggest that PM<sub>2.5</sub> is a better indicator than PM<sub>10</sub>. On the other hand evidence is also growing to show</b> that the “coarse fraction” of particulate matter (PM<sub>10</sub>-PM<sub>2.5</sub>) exposures <b>may also be health-relevant.</b> For the gaseous co-pollutants (e.g. CO, NO<sub>x</sub>, SO<sub>2</sub>, O<sub>3</sub>) <b>health effects of O<sub>3</sub>, and maybe also CO, are considered important, whereas others may serve as an indicator (surrogate) for the mixture without being a causal health effect agent themselves under the current (low) exposure levels.</b></p>	<p>PM is considered as a very complex mixture and its chemical and physical composition varies over time and seems dependent upon meteorological and long-range transport conditions and specific source contributions. However, there is now a large degree of certainty that adverse health impacts to the lung and cardiovascular systems are associated with the fine particle portion (≤PM<sub>2.5</sub>) originating directly from combustion and industrial processes, such as from large point sources like coal-fired power plants and steel mills, and from area and mobile sources such as vehicles and indirectly through the complex atmospheric formation of secondary particles from precursor gases. There is also growing evidence to show that exposure to the “coarse fraction” of particulate matter (PM<sub>10</sub>-PM<sub>2.5</sub>) may be associated with adverse health impacts in at least some locations. These source emissions should be a priority for cost-effective risk reduction in affected airsheds. For the gaseous co-pollutants (e.g. CO, NO<sub>x</sub>, SO<sub>2</sub>, O<sub>3</sub>) health effects of O<sub>3</sub>, and perhaps also CO, are considered important, whereas others may serve as an indicator (surrogate) for the mixture without being a causal health effect agent themselves under the current (low) exposure levels.</p>
	<p>Scientific studies conducted over the past decade have confirmed that current levels of air pollution are a significant global public health concern <b>[an option here is to use the estimates of air pollution associated health effects from the WHO global burden of disease report].</b></p>	<p>The following statement from the conference background paper “Health Effects Associated with Exposure to Ambient Air Pollution” by J. Samet and D. Krewski (2003) has been added: <i>The World Health Organization (2002) has identified ambient air pollution as a high priority in its Global Burden of Disease initiative, and estimated that air pollution is responsible for 1.4% of all deaths (Cohen et al., 2003).</i></p>

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	<p>There is consistent and convincing evidence to show that both short term and long term exposures <b>at some level of air pollution</b> are associated with premature mortality and a range of cardiovascular and respiratory illnesses, <b>although the public health significance of this is still a matter of discussion.</b></p> <p><b>Epidemiology</b> studies of <b>ecological design</b> conducted over the past decade <b>continue to show</b> that current levels of air pollution are a significant global public health concern.</p>	<p>These uncertainties are captured in Statement 4 which identifies the need for further research to characterize the health effects associated with various air pollution sources identifying susceptible subgroups.</p> <p>The term "ecological design" may not be understood by all readers and does not include time-series, longitudinal panel, prospective cohort studies and case control studies. The sentence has been revised as follows  <b>"Epidemiologic studies conducted over the past decade to examine the link between community ambient PM concentrations and health continue to show that current levels of air pollution are a significant local, (inter)national and even global public health concern."</b></p>
	<p>There is now a large degree of certainty that <b>small</b> health impacts are <b>often</b> associated with the fine particle portion (<math>\leq PM_{2.5}</math> and below), <b>where such data exist. There is limited new evidence suggesting concerns about <math>PM_{2.5}</math></b> originating i) directly from combustion processes, such as from large point sources like coal-fired power plants and steel mills, and from area and mobile sources such as vehicles and ii) secondarily through the <b>complex atmospheric</b> formation of secondary particles from precursor gases. These source emissions should be a priority for <b>cost-effective</b> risk reduction in affected airsheds. There is <b>less consistent</b> evidence from <b>ecological studies</b> showing that the "coarse fraction" of particulate matter (<math>PM_{10}</math>-<math>PM_{2.5}</math>) exposures and the gaseous co-pollutants (e.g. CO, <math>NO_x</math>, <math>SO_2</math>, <math>O_3</math>) are <b>less often</b> associated with adverse health impacts, <b>usually when data for <math>PM_{2.5}</math> are not available or are not statistically significant.</b> The health effects associated with exposure to ultrafine particles (<math>&lt;0.1 \mu m</math>) are <b>an emerging concern</b> and a high research priority due to lack of information.</p>	<p>See revised statement above (second response p. 3) which is consistent with the presentations and comments made in plenary on Nov. 7. The revision incorporates the terms "complex atmospheric formation" and "cost effective".</p>
<p><b>Statement 2</b></p>	<p>Focus on policies that are likely to achieve broad population health co-benefits. For example, integrate clean air objectives within urban planning and community design (green spaces, public transport, traffic demand management), climate change policies, energy conservation and energy efficiency programs, and health promotion planning, such as in the areas of obesity, diabetes and substance abuse (e.g. tobacco) Page: 8</p>	<p>No-regrets was not removed as break out groups indicated a preference for moving forward with low risk policy approaches that could reduce emissions as well as offer other public health and social benefits.</p>



Statement Section	Comment	Response
	(Comment: Why restrict to no regret CC policies?)	
	there is sufficient confidence in the information available for policymakers in affected airsheds to take further <b>cost-effective</b> immediate action.	This has been added
	there is sufficient confidence in the information available for policymakers in affected airsheds to take further immediate <b>(and non-regrets)</b> actions.	No regrets is already included in the statement.
	In North America and Europe, a wide range of clean air strategies have already been implemented (i.e. Tier II standards, ambient air quality standards <b>and limit values</b> , emission limits for industrial facilities, <b>emission ceilings for countries</b> ),	The terms in bold have been added
	Emission reduction strategies should target all relevant emission sources, which contribute to pollution levels in an affected airsheds. (Comment: Should not be restricted to major sources in affects airsheds.	This change has been made.
	In North America and Europe, a wide range of clean air strategies have already been implemented (i.e. Tier II <b>motor vehicle emission</b> standards, ambient air quality standards, emission limits for industrial facilities), while other policy strategies and emerging new technologies for emission reduction will be implemented over the long term (fuel cells, gasification of coal, electricity generation by gas turbine <b>[this technology already has widespread applications in California and elsewhere]</b> , etc.).	Text in bold has been added
	Air quality monitoring has demonstrated that historical air pollution abatement programs have been effective; however further monitoring and research is needed to ensure that existing and future policy approaches improve public health <b>[This should be softened. While research is useful, studies in southern California, Hong Kong, Ireland, Erfurt, Utah Valley, and Atlanta have demonstrated health benefits from emission controls and other interventions]</b> .	The statement has been revised as follows: While these strategies are designed and expected to improve air quality and public health, additional policies are still needed in specific airsheds throughout the world to lower air pollution to healthy or acceptable levelsAir quality monitoring has demonstrated that historical air pollution abatement programs have been effective in reducing ambient levels of air pollution. Studies in southern California, Hong Kong, Ireland, Erfurt, Utah Valley and Atlanta have demonstrated health benefits from emission controls and other interventions. Further monitoring and research is needed to ensure that existing and future policy approaches indeed lower population exposure and improve public health.

Statement Section	Comment	Response
	<p><b>While these strategies are designed and expected to improve air quality and public health it is remarkable that the evidence that air quality abatement strategies and implemented regulations have indeed improved public health is currently very limited because of a lack of information and suitable assessment and intervention studies. This 'accountability' issue has therefore increasingly become a critical component in policy- and decision-making. Nevertheless, because of the relatively large adverse impact of air pollution on public health,</b> strong policies are still needed in specific airsheds throughout the world <b>to lower air pollution to healthy or acceptable levels.</b></p>	<p>The statement identifies the need for further monitoring and research to ensure that policy approaches lower population exposure and improve public health. The conference noted evidence, though limited, to indicate benefits of emission reduction from case studies of regulatory action, industry closures or other situations.</p>
	<p>however further monitoring and research is needed to ensure that existing and future policy approaches <b>indeed lower population exposure and</b> improve public health</p>	<p>Text in bold has been added</p>
	<p>Reduce pollutants that are likely to result in multiple benefits for air quality, for example, precursors <b>that form both</b> fine PM and ozone</p>	<p>Text in bold has been added.</p>
	<p>Improve linkages with the medical, <b>patient,</b> and <b>school</b> communities to promote their roles as an early warning for air pollution indicators associated with adverse health effects, credible communication of information, and advocates for solutions</p>	<p>Patient has been added. Promoting linkages with schools is an excellent strategy but is not recorded in the conference presentations and discussion.</p>
	<p>While these strategies are expected to <b>significantly</b> improve air quality and public health, <b>additional</b> policies are still needed in specific airsheds throughout the world.</p>	<p>Text in bold has been added.</p>
	<p>Adopt a risk-based approach to <b>quantitative impact assessment and</b> policy development considering <b>predicted</b> benefits, costs, implementation time and feasibility</p>	<p>Text in bold has been added</p>
	<p><b>Validate (outlook-type) ex ante evaluations by (diagnostic) ex post evaluations and targeted intervention studies focussed on possible benefits from control actions; introduce the discipline of uncertainty analysis as an integral part of health effects evaluations and impact assessments.</b></p>	<p>The need for research to evaluate the effectiveness of policy strategies has been identified in statement 3. The need for uncertainty analysis as an essential component of health impacts assessment is identified in statement 5.</p>
	<p>Engage the public and other stakeholders early in the process to help <b>design,</b> focus, and build support for policy changes that directly affect them (e.g. urban transportation solutions, energy conservation, <b>and sustainable developments</b>).</p>	<p>Text in bold has been added</p>

Statement Section	Comment	Response
	Continued support for research to improve the scientific basis for the development of air quality policies and strategies is important; however this research should be focused on areas that will yield information useful in improving public health and <b>contributing to a sustainable living environment.</b>	Text in bold has been added
	There is a need and an opportunity to initiate innovative approaches to health effects research including international cross-disciplinary research to integrate epidemiology, toxicology, and clinical studies, <b>risk-based approaches and health impact assessment methodologies,</b>	Text in bold has been added
	Priority areas for research to guide <b>policy and to demonstrate the exposure- and health-effectiveness of control regulations</b> include further studies to better understand the causal agent(s) involved in the air pollution mixture that are responsible for the associations with adverse health outcomes,	Text in bold has been added.
	The key to an effective science-policy interface is through interactive dialogue among the scientific community, policy-makers, <b>stakeholders,</b> and the public. Informed public opinion can bring about rapid policy changes. It is necessary to accurately communicate the health effects of air pollution to raise public awareness of the relative importance of the health risks and to create the momentum and support for appropriate policy changes. <b>It is also necessary to include a better participatory approach for policy makers, stakeholders, and the public to effectively communicate end-user needs to the scientific community.</b>	Text in bold has been added.
	Pricing can be a powerful policy tool, however pricing policies need to be studied and implemented carefully to avoid potential disproportionate negative impacts among low income groups. <b>[Air quality is an inappropriate vehicle for redistribution of wealth and this bullet should be deleted.]</b>	This statement cannot be linked back to the source so will be deleted.
<b>Statement 3</b>	Health effects studies should continue to focus on identifying susceptible subgroups and understanding <b>all other, e.g.,</b> social, determinants associated with increased risk.	Sentence has been revised as follows: <i>Health effects studies should continue to focus on identifying susceptible subgroups and understanding social and other determinants that may be associated with increased risk.</i>

Statement Section	Comment	Response
	Emission reduction strategies should target major emission sources in affected airsheds for example, petroleum and coal burning sources and <b>motor</b> vehicles; <b>with respect to ambient PM there is a need to focus on those fractions and sources that are suggested to be toxicologically most important (if sound data exist).</b>	Text in bold has been added.
<b>Statement 4</b>	For example, the standard reporting requirements of the Journal of Epidemiology and Community Health and the CONSORT process are examples to follow. This would provide information in a format that would facilitate systematic review of the literature in support of policy decisions. (Comment: Sorry to say, but the chance that policy makers will read scientific literature is rather limited.)	The statement identifies the "AIRNET Alert" non-specialist summaries of recently published peer-reviewed papers or reports. The summaries provide plain language communication of research results that have implications for policy decisions.
	This would provide information in a format that is useful for policymakers and would facilitate systematic review of the literature for policy decisions. [What about toxicology studies that are being promoted to give chemicals/sources clean bills of health?]	This would be addressed in the initiative proposed in Statement 6.
	<i>I still believe a point I have consistently tried to get across is missing, so suggest adding the following sentence: The pace and extent of actions associated with reducing ambient air pollution levels vs other public health interventions also needs to be identified: to address this will require additional technical and process skills.</i>	This will be included as it was identified as an issue in break out group #3. "Everywhere in the world not uncontroverted by one or two participants who wanted to deal with local and other issues but worldwide we have a problem."
	For example, the standard reporting requirements of the Journal of Epidemiology and Community Health, the CONSORT process, <b>and the "AIRNET Alert" non-specialist summary approach</b> are examples	Text in bold has been added to the statement.
	<b>Establish communication frameworks between scientists, policy makers, stakeholders, and interested parties to create a widely basis for public health policy to improve air quality and to communicate and understand each other's needs.</b>	This text has been added to the statement.
<b>Statement 5</b>	<b>Quantitative health impact assessments and assessments of possible exposure and health benefits from air pollution abatement actions are challenged with large uncertainties regarding health effects, concentration-response relationships, and identification of causal pollutants which may become a suitable target for control. Nevertheless,</b>	This text has been added to the statement

Statement Section	Comment	Response
	<p><b>Techniques for assessing the effectiveness of</b> complex emission reduction scenarios <b>such as Cost Benefit Analysis or Cost Effectiveness Analysis are useful in identifying pollutant reduction strategies with multiple benefits</b> on human health and the environment. <b>The use of these policy analysis methods</b> should include <b>a reasonable treatment of risk factors, including exposure, special susceptibility of population sub groups, and the degree of certainty.</b> (Comment: Such tools have been used already, e.g. in the process of preparing the UN ECE Gothenburg Protocol or the NEC D.)</p>	Text in bold has been added to the statement.
	<p>Comment: There are some major research needs here, e.g., consideration of uncertainties. Our experience has been that control costs are generally over-estimated and health benefits are usually under-estimated.</p>	The following sentence has been added to the statement: <i>However, predictions about future benefits of air pollution abatement strategies should be treated with caution and should always include an analysis of uncertainties.</i>
Statement 6	<p>There is a need for an independent, <b>systematic and regular evaluation</b> of the scientific evidence on air quality health effects for purposes of assisting policymakers. <b>Such tasks have been carried out previously by the UK Committee on Medical Effects of Air Pollution (COMEAP) for the United Kingdom on a national level, by WHO Euro e.g. for the European region of WHO and the European Commission,</b> and the WHO International Agency for Research on Cancer (IARC). A <b>well defined methodology for assessing the evidence systematically (e.g.,</b> weighting studies according to research design criteria) <b>has been applied in such exercises</b> to pool and integrate the results of the international literature on toxicology, epidemiology, socio-economic analysis and other policy analysis tools. An international review of principles for air quality policy development (socio-economic analysis, precautionary principle, health effects, ethical considerations etc.) will be undertaken to exchange perspectives on how these principles are implemented <b>under various circumstances (e.g. different legal systems)</b> and to identify strengths and weakness associated with each of the approaches.</p>	Text in bold has been added to the Statement.
	<p>COMEAP stands for Committee on the Medical Effects of Air Pollutants not Air Pollution as stated in the last paragraph on page 6.</p>	This correction has been made.
	<p>A worthy goal, but optimistic that these diverse experts can come to consensus. Consider the wide range in PM ambient air quality standards recently set by the EU, Canada, the US, and California.</p>	The objective would be to identify and explore the reasons for differences underlying standard setting processes in various jurisdictions.

## SUMMARY OF PLANNING COMMITTEE COMMENTS ON DRAFT 1 CONFERENCE STATEMENT AND REVISIONS

Statement Section	Comment	Response
	<p>My overall comment is that the delegates reflected strong scientific participation, but quite weak policy maker participation (which I guess you expected). To do a good policy job would require more government policy makers, corporate decision makers and a range of NGOs (both health and environmental), along with a strong complement of scientists whose orientation/interests include policy. The Rome AIRNET conference could be put in the context of being a starting point for more focused and designed policy engagement, especially since the conference participants mostly support the need for action now.</p>	<p>Agree. The following sentence has been added to the introduction.                      "The Statement will provide the focus for NERAM Colloquia 2004 and 2005 and related initiatives to engage broader participation of government policymakers, corporate decision makers, non-governmental organizations, and policy-focused scientists at the international level in identifying and implementing best practice in air quality management. "</p>
<b>General comments</b>	<p>I would like to see principles for action worked in somewhere, as this is I believe a key area for further work. If you feel inspired to change your framework, I would just have two main headings - something like: Concern about air pollution, and How to deal with it. The second heading would than have a number of subheadings such as:                      Principles to be applied                      Priorities for action (including cost-effectiveness and comparisons with other risks)                      Dealing with uncertainties                      Communication.</p>	<p>The principles for action theme has been captured under Statement #6. Will consider restructuring if other delegates have similar suggestion. Restructuring might be into three main headings; Findings, Actions, Further Work. The same statements would be used only rearranged.</p>
	<p>a) i think the statement reads like an advocacy doc. i do agree all the quoted statements were made at the conference, but so were many others with a different slant that were excluded (eg the argument that IAQ is a much larger issue). also, PM seems to be the almost-sole focus, with very little on the co-pollutants: as you know, many of us at the conference are not ready to accept that PM is the "causative agent" because this presently makes no toxicological sense (recall the document from Suresh Moolgavkar i sent you a few months ago, that quoted words to the effect that we can't believe it is the gases because we know a lot about them, therefore we believe it must PM, about which we know less: surely as scientists we can only proceed to understand things and communicate "the facts" based on what we do know?).                      b) maybe as help for the reworking: the doc is much too long: does it need all the pages of selective quotes? how about deleting most of these and keeping it high level? in that way, you would only need to rework a couple of pages and not risk upsetting those who were not quoted etc.</p> <p>c) the bottom-line message that i did hear from time to time (ie the issue is, at least in part,</p>	<p>Statement #1 has been revised to identify the role of co-pollutants.</p> <p>The quotes were provided as supporting material only for the purposes of finalizing the statement and will not be included in the final version. We learned from our last conference on Drinking Water Safety in which we decided after the fact to provide a transcript of the discussion in response to a delegate comment that "NERAM biased the documentation of the conference results" (which we work hard not to do). So we have provided</p>

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	<p>past research and into management) doesn't come clearly across. in fact, a visitor from outer space who read this would be forgiven for thinking this was a newly-discovered issue, with no-one outside the conference understanding it was a serious concern. surely we are past that! think of the AQ initiatives that you have been involved with over the past 5 yrs, and Canada is not an example of "highly polluted" country. something is wrong in the take-home message: it should read more like "the AQ concern is now prime time, even though we still do not fully understand what substance(s) are responsible for the health effects that we see in the epidemiology studies. actions have been taking place to improve AQ and the trend is positive [mention the new technologies], but we must not become complacent: more needs to be done. examples include...[use the examples from the document], but there are many additional requirements [institutional changes/upgrades, alternative approaches to urban development, improved communication between scientists and policy makers, more research etc].</p>	<p>supporting comments from the start this time so that people can see the basis for the statements.</p> <p>That Statement has been revised to indicate that significant air quality management measures have already been implemented and air quality has improved in some areas.</p>
	<p>The draft was too technical in some parts - it talked to specialists (meta analysis, PAHs, etc) - yet it lacked a balanced, objective tone in other places ("must take action now"). A uniform tone without too much detail would be my preference, rather than an advocacy paper - and an advocacy paper that exaggerates a single view of PM health effects from specific sources.</p> <p>I was disappointed that "cost effectiveness" did not get a mention. Similarly, there was no recognition of the regional nature or the specificity of some AQ problems in different air sheds. Different risk reduction measures may needed across the globe to address different concerns.</p> <p>Finally, I suggest that research needs be collected in one conference statement instead of scattered in two or three. As you review the recommendations for research, test how self-serving these sound to those readers who may not think they need more scientific information for public policy.</p>	<p>The word meta-analysis has been removed and the wording "must take action now" has been replaced with</p> <p>"there is sufficient confidence in the information available for policymakers in affected airsheds to take further immediate action". The role of co-pollutants has been identified several times in Statement 1.</p> <p>Cost effectiveness is identified in Statement 2 - "there are potentially cost-effective control measures for reduction of emissions..." and "adopt a risk-based approach to policy development considering benefits, costs, implementation time and feasibility". It is also addressed as a principle for decisionmaking in Statement 5. The regional nature of air quality problems is identified in Statement 1 and 2 through reference to</p>

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		"affected airsheds". The need for research on causal agents in statement 2 has been moved to statement 3 on research needs.
	Work needed...too much vagueness and ambiguity	The Statement was intended to be a brief, high level document. The conference summary report will provide more detail.
	Would have preferred that a longer discussion paper was prepared, which would then circulated or used to engage key policy and decision makers.	A conference summary report is in preparation for this purpose.
<b>Intro paragraph</b>	Did not the European Commission sponsor the event? The Commission appeared on the invitation leaflet for the joint NERAM/AIRNET conference. Perhaps also some Italian bodies should be mentioned such the City of Rome, who sponsored the conference dinner.	Yes the European Commission as a sponsor of AIRNET will be identified as a sponsoring organization. Also the Italian sponsors will be suitably mentioned.
<b>Statement 1</b>	I think that it is best to distinguish between short term and long term <u>exposure</u> and acute and chronic <u>effects</u>	Yes. this change has been made.
	<p>It is important to create a bridge to the topic of particles. Insert statement -</p> <p><b>Much of the recent research findings are dealing with the effects of particulate matter and much of the conference focused on particulate matter.</b></p> <p>..large "<b>point</b>" sources.</p> <p>There is also evidence showing that the "<b>coarse fraction</b>" of particulate matter (PM<sub>10</sub>-PM<sub>2.5</sub>) exposures</p> <p>The health effects associated with exposure to ultrafine particles "<b>in the size range around 0,1 um and below</b>" are also ..</p>	<p>Yes, this statement has been adapted to also indicate that delegates identified the important role of gaseous co-pollutants and air toxics.</p> <p>"point" has been inserted</p> <p>"coarse fraction" has been inserted</p> <p>the size range of ultrafines has been inserted</p>
	There is a large degree of certainty that health impacts are associated with the fine particle portion ( $\leq$ PM <sub>2.5</sub> and below) originating from any combustion process, such as from large sources like coal- <b>-fired power</b> plants and steel mills, and <b>from area and mobile sources</b> such as vehicles.	These changes have been inserted
	There is a large <b>number of studies showing</b> that health impacts are associated with the fine particle portion ( $\leq$ PM <sub>2.5</sub> and below), <b>but much less, and conflicting evidence implicating</b> combustion processes in coal plants, motor vehicles, and large point sources such as steel mills. These emissions should be a priority for <b>risk reduction in affected air sheds</b> .	The view that large combustion sources should be a priority for emission reduction was expressed by a number of individuals. The secondary formation of particles from gaseous precursors has been



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		added. The phrase "in affected airsheds" has been added.
	Insert - There is also evidence in some locations showing that PM <sub>10</sub> -PM <sub>2.5</sub> exposures <b>and the gaseous co-pollutants (eg CO, NO<sub>x</sub>, SO<sub>2</sub>, O<sub>3</sub>)</b> are also associated with adverse health impacts.	This has been added.
	The health effects associated with exposure to ultrafine particles are also of concern and continue to be <b>a high research priority due to lack of information. A number of studies find an association between the gaseous air pollutants, either alone or in combination with particulate matter, and health impacts; therefore, risk reductions strategies must also address ozone and the oxides of sulfur and nitrogen.</b>	The phrase " <b>high research priority due to lack of information</b> " has been added. The role of gaseous co-pollutants has been added to Statement 1. Statement 2 recommends reduction of precursors of fine PM and ozone.
	<p>I had some very serious differences of opinion with the draft summary, statement # 1:</p> <p>The AQ concern expressed is limited entirely to particulate matter; whereas, a very significant European representation of their major concern was ozone and other gaseous irritants. Health effects studies even find non-irritant gases, like carbon monoxide, may be the strongest "signal" on occasion (perhaps only as a surrogate). I think it's fair to say reductions in PM without regard to the other air contaminants may result in NO public health benefit at all, because the observed risks are so small by conventional epidemiological standards. There was certainly no agreement that PM from specific combustion sources was worse than other PM (this came from a Californian in my breakout session who felt the data were still too few and conflicted to blame all purported health effects of air pollution on one or more specific types of PM or point sources). Rather than using "risk management" in reference to emissions management (statement # 1), suggest "risk control (/ reduction)." I still hold RM to be the whole process, not just risk control / reduction / mitigation.</p>	<p>Statement 1 has been broadened to identify both PM and gaseous co-pollutants as important targets for emission reduction.</p> <p>"risk management" has been changed to "risk reduction"</p>
Statement 2	Although scientists are uncertain about the specific components of air pollution that are most responsible for health effects and mechanism of effects, " <b>the severe effects of particulate matter and other air pollutants</b> " necessitate that policymakers must take action now based on current scientific information.	This statement has been revised as follows: "Although there is some scientific uncertainty about the specific components of air pollution that are most responsible for health effects and the mechanism of these effects, there is sufficient confidence in the information available for policymakers in affected airsheds to take further immediate action."
	Although scientists are uncertain about the specific components of air pollution that are most responsible for health effects and mechanism of effects, policymakers must take <b>(and are</b>	The following statement conveys that actions have been and are

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	<b>taking</b> ) action based on current scientific information.	being taken: In North America and Europe, a wide range of clean air strategies have already been implemented (i.e. Tier II standards, ambient air quality standards, emission limits for industrial facilities)...
	Although scientists are uncertain about the specific components of air pollution that are most responsible for health effects and mechanism of effects, policymakers <b>in affected air sheds</b> must take <b>cost-effective</b> action now based on current scientific information. A wide range of clean air strategies have <b>already</b> been implemented (i.e. Tier II standards, ambient air quality standards, emission limits for industrial facilities). Other policy strategies and emerging new technologies will be implemented, <b>some by regulatory requirement</b> , over the next several years (fuel cells, gasification of coal, <b>electricity generation by gas turbine</b> , etc.). These policies are expected to improve air quality and public health, <b>and monitoring is required to ensure trends are towards improvements. However</b> research is still needed to better understanding the toxic components of PM to <b>ensure</b> the effectiveness of existing policy approaches.	Statement has been revised to include “ <i>in affected airsheds</i> ” “ <i>already been implemented</i> ” “ <i>electricity generation by gas turbine</i> ” “ <i>further monitoring and research is needed to ensure that existing and future policy approaches improve public health.</i> The principle of cost-effectiveness as a criteria for decisionmaking is addressed in Statement 5.
	<b>Air quality monitoring has demonstrated that historical air pollution abatement programs have been effective;</b> however <b>further</b> research is needed to evaluate the effectiveness of existing policy approaches <b>in improving public health. Further, continued research is needed to better understanding the toxic components of PM that are responsible for the associations with adverse health outcomes.</b>	These revisions have been made. The idea of continued research to identify toxic components is stated in Statement 3 to try and consolidate the research needs.
	These policies are expected to improve air quality and public health; however further research is needed to better understanding <b>the causal agent(s) involved in the air pollution mixture</b> and to evaluate the effectiveness of existing policy approaches.	This change has been made in Statement 3.
	The <b>presentations and discussions at the Conference demonstrated that the</b> following guidelines are provided for the development of effective clean air policies.  .... conservation and energy efficiency programs, and health promotion planning in the areas of obesity, diabetes <b>and substance abuse (e.g., tobacco)</b>  Reduce pollutants that are likely to result in multiple benefits, for example, <b>precursors of fine</b> PM and ozone  Adopt a risk-based approach to policy development considering benefits, costs, <b>implementation time</b> and feasibility	These changes have been made.

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	<p>Pricing can be a powerful policy tool; <b>however, pricing policies</b> need to be studied and implemented carefully to avoid potential negative impacts on lower socio-economic groups</p> <p>Engage the public and other stakeholders early in the process to <b>help focus</b> and build support for policy changes</p> <p>Improve linkages with the medical community to promote their role as an early warning system for <b>air pollution indicators associated with adverse</b> health effects, credible communicators of information, and advocates for policy change</p>	
	<p>Engage the public and other stakeholders early in the process to build support for policy changes <b>that directly affect them (e.g. urban transportation solutions and energy conservation)</b></p>	<p>This change has been made.</p>
	<p>...while other strategies and emerging new technologies for emission reduction will be implemented over the next several years (fuel cells, gasification of coal etc.); <b>however stronger policies are still needed</b></p>	<p>This phrase has been added.</p>
	<p>Emission reduction strategies should target major emission sources such as petroleum and coal burning sources, <b>as well as from vehicles</b></p>	<p>This phrase has been added.</p>
	<p>Emission reduction strategies should <b>not exclusively</b> target major emission sources such as petroleum and coal burning sources, <b>but focus on air sheds where these sources contribute to significant air problems</b></p> <p>Reduce pollutants that are likely to result in multiple benefits, for example, PM and ozone precursors <b>that can form either PM or ozone</b></p>	<p>The statement has been revised to indicate that these sources should be targeted in airsheds where they contribute to significant air quality problems. The phrase "that can form either PM or ozone" has been added.</p>
	<p>Adopt a risk-based <b>precautionary</b> approach to policy development considering benefits, costs and feasibility.</p>	<p>The precautionary principle has been identified as a principle for decisionmaking in Statement 6.</p>
<p><b>Statement 3</b></p>	<p>This sentence is rather negative. perhaps it should be rephrased to <b>"It is possible that the scope of future research needs to be broadened beyond narrow disciplines in order to provide evidence to support policy."</b></p>	<p>This revision has been made.</p>
	<p>It is <b>likely</b> that continued research conducted within narrow disciplines will not provide further evidence to support policy.</p>	<p>This revision has been made.</p>
	<p>Continued support for research to improve the scientific basis for the development of air quality policy strategies is <b>important; however, this research should be focused on areas that will yield information useful in improving public health.</b></p>	<p>This revision has been made.</p>
	<p>Priority areas for research to guide policy include studies to identify <b>whether some particles</b></p>	<p>The statement now reads "Priority</p>

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	<p><b>have specific toxic properties that can justify claims for a causal relationship with health impacts</b>, and to characterize the health effects associated with various air pollution sources.</p>	<p>areas for research to guide policy include further studies to better understand the causal agent(s) involved in the air pollution mixture that are responsible for the associations with adverse health outcomes, and to characterize the health effects associated with various air pollution sources.”</p>
	<p>..improving access to existing health datasets while assuring patient confidentiality will assist in reducing the time frame in which scientists will be in a position to provide targeted policy recommendations, <b>such as standards setting, or determining the effectiveness of solutions.</b></p>	<p>These additions have been made.</p>
	<p>Improving access to existing health datasets while assuring patient confidentiality will <b>not only reduce the time for scientists to achieve consensus on appropriate analyses, but will help assure the quality of data underpinning</b> policy recommendations.</p>	<p>The sentence now reads “improving access to existing health datasets while assuring patient confidentiality will assist scientists in providing timely research results to support policy recommendations such as standard setting or determining the effectiveness of solutions.”</p>
<p><b>Statement 4</b></p>	<p>They also need to understand the <b>degree of certainty in drawing conclusions in specific</b> areas. More dialogue between policymakers and scientists to identify information needs for policy decisions and <b>the degree of certainty required in</b> the science in order to take action would assist in targeting research expenditures towards critical information needed for policy development.</p>	<p>These changes have been made.</p>
	<p>Establish a common language around the concept of “<b>associated effects</b>” and the interpretation of “<b>causality</b>”</p>	<p>These changes have been made.</p>
	<p>They also need to understand the areas <b>and significance of scientific</b> uncertainty</p>	<p>This change has been made.</p>
	<p><b>Informed</b> public opinion</p> <p>It is necessary to <b>accurately</b> communicate the health effects of air pollution to raise public awareness of the risks and create the momentum and support for policy changes. QUESTION: IS THE PREVIOUS SENTENCE NECESSARY? DO WE ACTUALLY BELIEVE THE PUBLIC DOESN'T KNOW ABOUT THIS??</p>	<p>This change has been made.</p> <p>The word accurately has been added. The numerous mentions of the importance of communication of research findings with policymakers and the public warrant the inclusion of this sentence.</p>

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	It is necessary to communicate the <b>relative</b> health effects of air pollution to raise public awareness of the <b>relative</b> importance of the risks and create the momentum and support for <b>appropriate</b> policy changes.	"relative importance " and "appropriate" have been added
Statement 5	Techniques for assessing the effectiveness of interventions such as Cost Benefit Analysis or <b>Cost Effectiveness Analysis</b> , could be useful in identifying pollutant reduction strategies with multiple benefits such as precursors to Ozone, PM, Toxics, PAHs, etc.	This change has been made.
	Use of these policy analysis methods will also ensure a fair and reasonable treatment of risk factors, including exposure, measurement of PM <b>and gaseous pollutants</b> , special susceptibility of population sub groups, and degree of certainty.	This change has been made.
	Use of these policy analysis methods will also ensure a fair and reasonable treatment of risk factors – this is not clear to me	See previous.
Statement 6	I have not participated in all discussion of the break out group but assume (with the support of my notes from the plenary discussion, including the presentation of John Vandenberg quoted in the Annex p. 6) that, besides COMEAP, the review programme organized by the WHO Euro was indicated as the example of effective review of scientific evidence on AQ and health issues. While IARC is responsible for the review of carcinogenic properties of various substances, the health aspects of air pollution is the task of WHO-Euro.	Agree. WHO-Euro is now identified in Statement 6 among those organizations that review scientific evidence on AQ and health.
	Personally I have problems with the basis of the concept "weight of evidence". I think that 100 studies showing no effects of a specific pollutant can not outweigh a single study showing effects if it is significant and has been designed in a proper way. When breaking new ground in science it is important that hypotheses and results are produced that are conflicting with common wisdom and accepted facts. I think it may be sufficient to use the terminology " A framework" and that it is implicit the integration/synthesis of the information from different studies are weighted according to the design and size of population etc.	The sentence has been revised as follows: "A framework for weighting studies according to research design criteria will be applied to pool and integrate the results of the international literature on toxicology, epidemiology, socio-economic analysis and other policy analysis tools."