Air Quality Management Subcommittee
October 18-19, 2006
Indianapolis, IN

Meeting Notebook Table of Contents

All materials included should be considered DRAFTS. These drafts are meant to guide discussions of the AQM Subcommittee and do not represent final decisions or opinions made by the EPA, the CAAAC, or the AQM Subcommittee.

Air Quality Management Subcommittee Meeting
October 18-19, 2006
Indianapolis, Indiana
Meeting Agenda

Wednesday, October 18

8:30-9:15	Introductions and Welcome	Greg Green and Patrick Cummins
9:15 – 10:00	Air Quality Management Plan Discussion	Brock Nicholson and Anna Garcia
10:15-10:30	Break	
10:30-12:00	Air Quality Management Plan Discussion cont.	
12:00-1:00	Lunch	
1:00-1:30	Conclude AQMP Discussion	
1:30- 3:00	Boundaries Discussion	Jeff Underhill and Janet McCabe
3:00-3:15	Break	
3:15- 4:30	Conclude Boundaries Discussion	
4:30 – 4:45	Tools Follow-up	Deborah Wood and Debbie Stackhouse
4:45-5:00	Wrap Up and Adjourn	Greg Green and Patrick Cummins

Thursday, October 19

8:30-9:00	Recap Day 1Discussions	Greg Green and Patrick Cummins
9:00-10:00	Consensus on AQMP and Boundaries	Greg Green and Patrick Cummins
10:00-10:15	Break	
10:15-11:15	Discuss Draft Report	Jeff Whitlow
11:15-12:00	Next Steps and Adjourn	Greg Green and Pat Cummins

For members not able to attend in person, there is a conference line for the meeting
Conference Number 866-299-3188
Conference Code 9195415369

HOTEL INFORMATION

Hilton Downtown Indianapolis
120 West Market Street,
Indianapolis, IN
Tel: 317-972-0600

Recommendation for Comprehensive Air Quality Management Planning

To improve the air quality management process, and to move from a single pollutant approach to an integrated, multiple pollutant approach to managing air quality, States, local governments, and Tribes should adopt a comprehensive air quality planning process and, through this process, create comprehensive air quality management plans (AQMPs).

The NAS report noted that an integrated, multiple pollutant approach to managing air quality would be more effective, efficient and timely than the current, single pollutant approach to address today's air quality challenges. The concept of a comprehensive air quality management plan, or AQMP, is to provide a framework that could be used to integrate analysis, planning, and implementation of air quality management programs. The AQMP would be developed at the discretion of the State, local, or Tribal government, or a multi-jurisdictional organization that is responsible for dealing with air quality issues in a geographic area. It is a plan that would be created at a state, local or regional level, involving all appropriate stakeholders, outlining how the jurisdiction or jurisdictions intend to address air pollutants in an integrated manner, including, but not limited to, attainment and maintenance of the NAAQS, sector-based reductions of criteria pollutants and hazardous air pollutants (HAPs) to protect the public health, improvements for visibility in Class I areas, strategies for reducing HAPs, ecosystem protection, and local environmental issues within a State.

Developing an AQMP is envisioned as a broad process that reflects significant interaction between the energy, transportation and environmental entities at the State, local and regional levels, as appropriate, as well as with other stakeholders. For a comprehensive AQMP, issues that relate to air quality, such as energy policy, climate change, transportation, and land use should, to the extent possible, be considered in the AQMP. The goal would be to create a comprehensive plan that is multi-pollutant based, addresses all of the critical air pollution issues within a State, focuses on other important air quality goals in the geographic area, sets priorities, and provides an overall plan for moving forward with the strategies outlined in the plan.

It is envisioned that the AQMP would be revised periodically (e.g., every 5 years). The periodic revision of the AQMP would be accomplished through the air quality management planning process. Air quality management planning is envisioned as an on-going process that would require regular input from all stakeholders. Since the AQMP would be developed on a voluntary basis at the discretion of the State, local, or Tribal government, or a multi-jurisdictional organization, only the CAA mandated components contained in the AQMP (e.g., the SIP) would be required to be submitted to EPA.

Options related to the implementation of the AQMP recommendation

There is broad consensus within the AQM workgroup on the concept and desirability of a comprehensive Air Quality Management Plan (AQMP). The AQMP drafting team has proposed an outline for the plan which incorporates federally required elements for criteria pollutants (State Implementation Plan elements) and other non-SIP elements (e.g., MACTs) in addition to elements that are not federally required such as local planning, growth forecasts, and communication strategies. The merits of preparing an AQMP include:

- The process of doing an AQMP enhances coordination between federal, state, and local governments
- Provides more access and transparency to the public regarding what their government agencies are doing to protect public health, what is being accomplished, and what still needs to be done
- Enhances role for locals and MJOs in air quality planning
- Valuable tool that identifies gaps where more needs to be done
- One-stop-shopping for public and the regulated community

There was also consensus on the notion that a state should not be required to develop an AQMP. Instead, the benefits, coupled with new and expanded incentives should provide sufficient motivation for a state to prepare an AQMP voluntarily.

Two major issues need to be addressed before most states would consider developing and implementing an AQMP. First is the issue of resources. Most states are hardly able to meet current obligations due to a lack of resources and could not add AQMPs to their already full plates. The second issue is EPA oversight – that is the extent to which a state that develops an AQMP would be obligated to secure EPA approval of revisions to the plan.

Resources and Incentives

In the absence of additional funding to support the development of AQMPs, either the effort to develop the plan will need to be offset by resource savings that accrue from the implementation of the plan, or the benefits and incentives must be sufficient to justify the resources used to prepare the plan. The drafting team has proposed the following incentives:

- Preferential credit/treatment in 105 funds allocation.
- In-kind resources from EPA staff in developing the AQMP.
- Find acceptable ways of streamling the SIP process for states that are doing an AQMP.

- EPA could allow states to trade off administrative obligations that achieve little in terms of public health protection for programs/activities that enhance public health protections. [An example is attached.]
- EPA could explore the CAA section 110 authority for the purpose of providing support for the development of AQMPs.

Of these incentives, the last two have the potential to provide substantial motivation for a state to commit resources to the development of an AQMP. *The AQM Workgroup should fully assess the implications and options related to the trade-off recommendation including, but not limited to, the legal implications, the relative "value" of the programs/activities under consideration, the impact on inter-state obligations/expectations, the basis for approval and who must be consulted before a trade-off is approved.*

EPA Oversight

EPA has broad authority to prescribe what is and is not included in a SIP, to decide which proposed actions by a state are acceptable and which are not, and to determine when revisions to the SIP are or are not consistent with Clean Air Act requirements. As noted in the NAS report, this system has significant flaws, flaws that should be avoided with the implementation of the AQMP recommendation. Accordingly, the drafting team discussed two options related to EPA's oversight of AQMPs. Under either option, the AQMP should clearly indicate which provisions of the plan are subject to EPA approval, and which are state-only provisions.

The first option would be for a state to submit the plan to EPA only if they are seeking approval of a trade-off as discussed under "Resources" above, and to limit EPA's oversight to those provisions that are relevant to the trade-off.

The second option is for a state to submit only those provisions that are federally required and to include in the submission evidence that the state has developed a comprehensive AQMP. Under either option, the state would need to develop an AQMP if it wanted the incentives.

PSD trade-off example

Current requirements to obtain PSD permit:
- BACT analysis
- NAAQS assessment
- Increment assessment
    - Trigger date
    - Baseline assessment
    - Increment consumed so far
    - Analysis of impact of source on remaining increment
- Pre- and post- monitoring
- AQRV analysis
- Class I area analysis

Proposed alternative:
- BACT analysis
- NAAQS assessment
- Commitment to: <these are examples, NOT proposals>
    - Periodically review air quality impacts and to act if specific conditions are found in the periodic review; or
    - Implement an emission cap in all or a portion of the state; or
    - Reduce emissions that are causing problems in a Class I area (e.g., FLM has identified area where a critical load has been exceeded).

Discussion
As the PSD program is currently implemented, a PSD application triggers a host of requirements that collectively are meant to limit emission increases in attainment areas. For most states, large new emission sources are less of a problem than the collective emissions from many smaller sources, yet unless a PSD application triggers an analysis, the impact of these sources is never evaluated. This is especially a concern near Class I areas, where small increases in emissions can affect ecosystems.

In this example, trade-offs would relieve the state and PSD applicants of many of the administrative requirements under the current PSD program in return for actions that will improve air quality in the state or actions that will be more effective managing clean air resources. The alternative would be vetted through a public process involving concerned stakeholders.

Outcomes
- Faster, more predictable permit decisions;
- Expanded air quality protections (not just in response to a permit);
- Agency resources devoted to air quality improvements, not process.

This is a work-in-progress and is DRAFT. This draft has not been reviewed by the AQM Subcommittee or the CAAAC

AQM Subcommittee Phase II Draft Report Ouline
October 2006

I. Introduction and Executive Summary

II. Background

NRC Background
Insert text

Air Quality Management Work Group

In June 2004, the Clean Air Act Advisory Committee (CAAAC) formed an Air Quality Management Work Group to evaluate the National Research Council's (NRC) comprehensive recommendations and advise the EPA on ways to improve the Air Quality Management (AQM) system. The Work Group included representatives from state and local governments, Tribal interests, regional organizations, environmental and public health organizations, industry, and the USEPA.

In December 2004, the Work Group presented its final report to the CAAAC with thirty-seven recommendations; the CAAAC decided to include one additional recommendation, for a total of thirty-eight. The recommendations fall into the five broad categories outlined in the original NRC report:

(1) Strengthen scientific and technical capacity
(2) Expand national and multistate control strategies
(3) Transform the SIP process
(4) Develop an integrated program for criteria pollutants
(5) Enhance protection of ecosystems and public welfare

Early in the Work Group's deliberations, it was determined that were many non-controversial improvements that could be made to the AQM system that would greatly improve its effectiveness. The Work Group also agreed that it would focus on suggestions that were responsive to the issues raised by the NRC but that would not require statutory, or even in many cases regulatory or policy change, to accomplish. Because of the pending State Implementation Plan (SIP) deadlines faced by states for ozone, fine particles, and regional haze, the Work Group wanted to make recommendations that could be implemented in the relatively near term. At the same time, however, the Work Group also decided that it would recommend a second Phase of study, for consideration of more systemic, perhaps more controversial, changes.

The final thirty-eight recommendations are described in full in the Work Group's Report, "Recommendations to the Clean Air Act Advisory Committee" (January 2005). As noted above, the CAAAC accepted all of the Work Group's recommendations and forwarded them to the US EPA Administrator. On [date], the US EPA indicated to the CAAAC its agreement with the recommendations and intent to proceed with implementation and to report back to the CAAAC on its progress. (While there was unanimous agreement that all of the recommendations should be pursued, the Work Group and CAAAC members also recognized that there would be resource considerations, and that some recommendations were much more involved than others).

Implementation of Phase 1 Recommendations

In February 2005, the EPA accepted 38 AQM recommendations from the NRC (referred to as Phase I), and agreed to take the lead on 37 of the recommendations. The EPA believes it is more appropriate that a State, local, or Tribal agency take the lead on recommendation 3.8, Effective Communication with Constituencies. To date, EPA has completed 11 of the recommendations and is making progress on addressing all the recommendations. Some examples of completed recommendations include: (1) Recommendation 2.5 - developing compliance strategies to ensure that heavy-duty diesel engines are in compliance with regulations both in fleet use and manufacturing, and by improving voluntary program strategies; (2) Recommendation 2.6 - Initiated rulemakings to address the emissions from ships, locomotives, and aircraft and also mobile source air toxics; (3) Recommendation 3.2 – developed a SIP protocol that established guidelines to improve communication between EPA and the State and expedite SIP revisions; (4) Recommendation 3.11 – developed guidance on how to incorporate "bundling" measures for SIP credit. Longer term projects such as improving information on monitoring, emissions inventories, modeling, developing a framework for accountability, improving ecosystem protection and information are moving forward and should be completed in several years. The Phase I report and additional information can be found on the CAAAC website at http://www.epa.gov/air/caaac.

Air Quality Management Subcommittee

In March 2005, EPA established the Air Quality Management Subcommittee under the Clean Air Act Advisory Committee. The subcommittee is charged to assess and develop recommendations for long-term systemic changes to the air quality management system as recommended by the Work Group. The subcommittee is also charged with monitoring EPA's implementation of the 38 recommendations. As with the Work Group, the subcommittee's membership is comprised of representatives from state and local governments, Tribal interests, regional organizations, environmental and public health organizations, industry, and the USEPA.

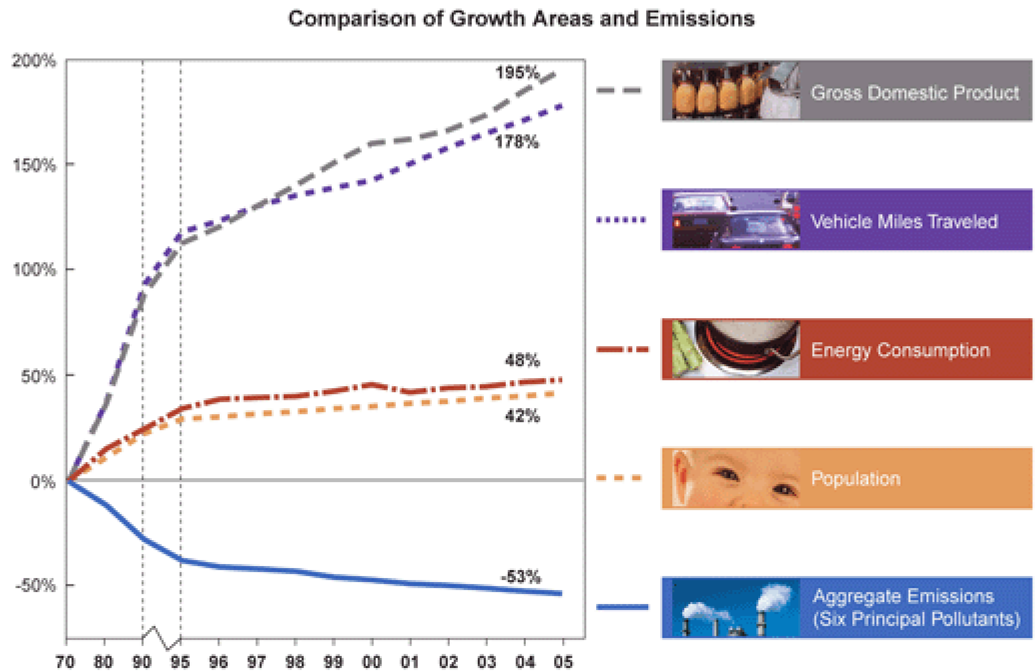
The subcommittee has held meetings all over the United States to discuss the recommendations contained in the final report. In October 2005, the subcommittee members decided to facilitate the consideration of various ideas that would form its recommendations it would divide into two work teams. The first team was charged with evaluating improvements to the air quality management process. The first team focused on four areas of concerns: problem definition, the air quality management process, coordination, and improving communications and partnerships. The second team was charged at examining and developing tools that can be used to improve air quality in places where traditional efforts have not demonstrated success. In June 2006, the subcommittee received final reports from both teams and began integrating all of the recommendations into this report.

Substantial Consensus

Early in the Air Quality Management Subcommittee's discussions, prior to the drafting of recommendations, there was agreement to use the principle of substantial consensus as the means to decide which recommendations would ultimately be adopted by the subcommittee. It was agreed that achieving unanimous agreement on any future recommendations would not be possible and lack of unanimous agreement should not block any specific recommendation from moving forward. The recommendations in this report reflect wide agreement by most of the members but, due to the diverse composition of the subcommittee, not all members were in agreement on all of the recommendations.

Context

Over the past 30 years much has been accomplished to improve air quality. National programs, along with state and local initiatives, have provided significant reductions in emission of air pollutants. From 1970 to 2005 total emissions of the six principal air pollutants have decreased by 53 percent while, in that same period, gross domestic product increased by 195 percent, vehicle miles traveled increased by 178 percent, and energy consumption increased by 48 percent.



Despite the progress that has been made to date, there remains room for improvement. The NRC report identifies a number of significant challenges remaining in our air quality management system that require a new perspective, additional tools and innovative strategies. Addressing these challenges will insure future progress and keep pace with meeting our national goals to provide the public with cleaner, more healthful air.

Plans are already in place for both short and long term programs aimed at reducing air pollution and achieving emission reductions. Over the next two years, states will submit SIPs to demonstrate attainment of current PM2.5 and ozone standards as well as reasonable progress in reducing regional haze. In addition, EPA has proposed to revise the PM standards and is reviewing the ozone standard. The potential for revised standards may precipitate implementation of Phase I and Phase II recommendations, including a comprehensive approach to air quality planning.

<INSERT TIMELINE FOR KEY RULES>

In the long term, major pollutant reductions will occur in the next twenty years as a result of federal regulation of mobile and stationary sources. Specifically:

- The Clean Air Interstate Rule (CAIR), finalized by EPA on March 10, 2005, will result in the deepest cuts in sulfur dioxide (SO2) and nitrogen oxides (NOx) in more than a decade. By the year 2015, CAIR will result in:
    - $85 to $100 billion in annual health benefits, annually preventing 17,000 premature deaths, millions of lost work and school days, and tens of thousands of non-fatal heart attacks and hospital admissions;
    - nearly $2 billion in annual visibility benefits in southeastern national parks, such as Great Smoky and Shenandoah;
    - significant regional reductions in sulfur and nitrogen deposition, reducing the number of acidic lakes and streams in the eastern U.S.

III. Challenges for Air Quality Management – A Look Ahead

Over the past thirty years, air quality management programs in the United States have made significant progress in a number of key areas. For instance, the number of areas out of attainment with air quality standards has declined dramatically; air quality standard violations of several pollutants, including sulfur dioxide, nitrogen oxide, carbon monoxide and lead, have been nearly eliminated; and the concentrations of the other criteria pollutants have dropped considerably in much of the country. This progress has resulted in substantial public health benefits and economic savings, during a period of sustained growth in the economy, energy production, vehicular travel, and population (Figure 1).

Yet a number of serious air quality management challenges remain, from the areas with lingering nonattainment problems with ozone and particulate matter to heightened awareness and concern over exposure to air toxics; from the relatively high background levels of air pollution (some of it from international transport) to the effect of air pollution on climate change – and vice versa. In addition, the economic and societal factors that influence air pollution to continue to grow. To be effective, future air quality management will need to address all of these challenges.

Continued Nonattainment Problems: Ozone and Particulate Matter

Despite the implementation of the federal NOx SIP Call, the Clean Air Interstate Rule (CAIR), federal mobile source rules, and various state, local, and tribal initiatives, our air quality modeling forecasts suggest that a number of areas would remain out of attainment with the current national ambient air quality standards for ozone and particulate matter in 2015 even after such programs are implemented (Figure 2). The number of residual non-attainment areas would be increased if the proposed revisions to the PM2.5 standards are promulgated. This attainment 'gap' must be addressed by the AQM system between now and 2020.

CAIR, which aims to cut NOx and PM emissions from electric generating sources by around 60 percent by 2015, along with tighter federal mobile source rules, are still predicted to leave 14 areas in nonattainment with either PM2.5 or ozone standards in 2015. These nonattainment areas, according to EPA modeling, are expected to be concentrated in California and in a geographic region between Michigan and Alabama, including Atlanta. The common thread in eastern projected nonattainment areas appears to be higher regional PM2.5 and ozone levels. For PM, this regional problem is expected to be exacerbated by concentrations of local sources of direct PM emissions such as industrial facilities.

These lingering nonattainment areas are of particular concern given the increased scientific evidence which has emerged over the past decade linking ozone and particulate matter exposure to a wide range of serious human health effects. In addition to the long-recognized effects of ozone on lung function, more recent scientific studies have linked ozone to mortality (particularly among the elderly), hospital admissions for respiratory ailments (particularly among children), school absenteeism, and incidence of asthma.

Likewise, scientists now better understand the very serious health effects associated with fine particulate matter exposure. Numerous studies had previously linked PM to a wide range of cardiovascular and respiratory health problems; new studies demonstrate associations between short-term exposure and various indicators of PM and cardiopulmonary mortality, hospitalization and emergency department visits, respiratory symptoms, and the development of lung capacity in children. The evidence now shows an association with cardiovascular health problems, including increased heart attacks, development of atherosclerosis, and changes in blood chemistry. Children and the elderly, as well as people with pre-existing cardiovascular or respiratory diseases such as asthma, are particularly susceptible to health effects caused by PM.

One of the difficulties in addressing particulate pollution is the wide range of sources that produce direct and/or secondarily formed PM, from diesel engines in on-road and off-road vehicles, to electric generating facilities, industrial combustion and process sources, and residential woodstove use. Moreover, in some areas, a substantial fraction of particulate matter pollution emanates upwind and contributes to local problems. These background levels of pollution are extremely hard for state, local, and tribal air quality planners to address, yet they must be considered.

Another challenge for air quality management that has surfaced in recent years involves the speciation of particulate matter; that is, the various types of particles (e.g., sulfates, nitrates, carbon, and crustal). A number of key questions remain: which types of particles or source types are most toxic? Which contribute to the most serious public health, climate, and ecosystem effects? The answers to these questions may assist air quality managers hone strategies to address the greatest threats among particulates.

As the NRC report recognized, an emerging area of concern for both ozone and particulate matter is the growing evidence that there is no clear threshold, or level below which no serious health impacts will occur. Studies of both pollutants suggest that there may be no threshold, and even low level exposures to ozone or PM may be harmful to human health.

The most recent scientific information on the health and environmental effects of particles, ozone, and related precursors suggests that the standards and programs for these pollutants will likely remain at current or even more restrictive levels for the foreseeable future. Developing strategies to attain and maintain current or tighter standards in the long-term will pose a significant challenge for the air quality management system. It appears likely that this will require new and innovative emissions reductions strategies; drawing in under-regulated emissions sources, such as marine vessels, locomotives, and grandfathered industrial facilities; instituting transportation control measures to address increasing vehicle use; and initiating regional planning efforts to engage in a more holistic approach to air quality management.

Air Toxics

Historically, the air quality management system has not allocated the same level of resources to air toxics control and management efforts as compared to ozone and PM. While ozone and PM programs have resulted in the reduction of a number of toxic components and precursors, residual air toxics problems still exist on local, regional, and even global scales, and the NRC report and recent National Air Toxics Assessment (NATA) work suggest that exposure to various air toxics pose significant risks to public health. The most recent NATA report suggests a background cancer risk for much of the nation in the range of between 1 and 25 in a million, with much of that coming from a single compound, benzene. Moreover, the areas of higher risk tend to occur in populated urban areas and in the eastern U.S., which also tend to overlap the ozone and PM non-attainment areas.

It is useful to separate air toxics into two categories:
1) persistent bioaccumulative toxics such as mercury and other heavy metals, dioxins, and pesticides. Such toxics often have a long atmospheric lifetime and are prone to long distance transport (hundreds to thousands of miles) and multimedia pathways to human exposure, often through ingestion of contaminated foods that have concentrated substances deposited from atmospheric transport. To a large extent, dealing with these toxics is a matter of addressing the sources – including those located abroad – that contribute to the buildup of background concentrations.

2) high-risk species with short-to-medium term atmospheric lifetimes. These 'traditional' air toxics have more of a local impact through direct inhalation and are much more likely than bioaccumulative pollutants to pose environmental justice concerns. These pollutants, particularly those from stationary sources from industrial to area in size, have been the subject of Section 112 regulations. Petroleum refining, mineral extraction and smelting operations, hazardous waste combustion, and various other source categories have all been the subject of Section 112 "Maximum Achievable Control Technology" regulations. In many urban areas, "traditional" air toxics exposures are dominated by mobile source emissions. Toxic "hot spots" often occur in predominantly low-income communities situated adjacent to major highways, congested roads, transit depots, marine and rail terminals, as well as near commercial and industrial sources.

Emerging information points to a potential overlap between traditional air toxics and PM concerns. A growing body of evidence suggests both exposures and health effects of concern for populations who spend significant time on or near heavily-traveled roadways. The issue may be related to direct localized emissions of ultrafine, fine, or even coarse particles, associated organic or inorganic gaseous tailpipe emissions, or multiple factors, including toxic subcomponents of such emissions. While this area is the subject of increasing research activity, it is important to note that National Ambient Air Quality Standards and State Implementation Plans have not developed effective strategies to deal with micro-environments such as these. Instead, 'hot-spots' would require different and innovative management techniques that could include transportation planning, city planning, and a variety of mitigating actions (e.g., diesel retrofits).

Other Effects of Air Pollution/Interactions

In addition to addressing the lingering nonattainment problems for ozone and PM and ongoing air toxics problems, air quality management must also confront other effects of air pollution including climate change and ecosystem impacts.

Climate Change

Warmer temperatures and air pollution experience a dynamic relationship, as each may exacerbate or mitigate the other. For instance, rising temperatures cause greater ozone production, so a warming earth may lead to more ozone pollution in many areas. In addition, warmer weather directly would affect energy demand: as temperatures rise, so too does electricity use. More electricity use would lead to greater utilization of existing power plants, or (eventually) to more power plants. In turn, this would lead to more NOx, SOx, PM, VOC and CO emissions in the summer. A warmer winter may also lead to less energy demand, which would help in areas where PM2.5 problems are dominated by woodsmoke and related wintertime heating emissions.

Another possible—though not certain—impact of global warming is an increase in the frequency of wildfires, generally because of hotter and drier conditions or because of other consequences of climate change (for instance, climate change may cause greater seasonal variations in rainfall in certain locations. More rain may lead to more vegetative growth; if hotter and drier conditions prevail as the season progresses, the trees and plants may become a tinderbox and cause more extensive wildfires because of their greater density.) An increase in wildfires will have a direct impact on air quality, as fires emit various air pollutants, such as PM2.5, SO2, NOx, and a host of hazardous air pollutants including benzene, toluene, and polycyclic organic matter.

Air quality linkages to climate work in the other direction as well, because some air pollutants may affect global warming For instance, while carbon dioxide and tropospheric ozone help to warm the globe, sulfates resulting from sulfur dioxide emissions serve to cool it. A number of scientists believe that the relatively cool period at the beginning of the second half of the twentieth century was tied to an increase in the emission of sulfates.

More recently, scientists have begun to focus on the regional and local scale effects of air pollutants on weather and climate, and here the effects may go beyond the traditional focus on simple warming and cooling by aerosols and gases. One of the key points is illustrated by recent global simulation modeling done by Mark Jacobson of Stanford University. He reports two important findings. First, reducing particulate matter concentrations in the Eastern U.S. may produce warming, since sulfates cause cooling by increasing cloud cover that reduces sunlight reaching the ground and increases that reflected into space. Second, Jacobson builds into his model findings that the increased cloudiness associated with the sulfate particles comes with a decrease in cloud droplet size, which results in reduced precipitation. This illustrates an important potential regional effect of air pollution, namely that air pollution can affect climate on a regional scale, and some of the effects – reduced precipitation – may be problematic. Recent results from researchers at the Desert Research Institute suggest that atmospheric sulfates may be reducing the amount of snow pack accumulation in the Rocky Mountains, potentially aggravating drought conditions. These results illustrate the importance of examining the unexpected feedbacks between air pollution and climate.

The bottom line is that understanding the connections between global warming and air quality management is not easy, and there is great uncertainty, particularly over the timing, extent, scale and localized impact of these potential effects. Nonetheless, the effect of climate change on air quality and vice versa is far too important a concern to ignore. For air quality managers, these multifaceted linkages could include the following: 1) it is vital to develop a system that attempts to anticipate the potential impacts of forecast climate changes on air quality 2) The AQM system must anticipate and provide for the possible need for conventional and innovative multipollutant programs that address both conventional air pollutants as well as greenhouse gases; 3) Future programs may also need to address the effects of air pollution on regional or local climate in the US.

Environmental Effects

Historically, Federal and State air quality management programs have not focused significant attention on environmental effects of air pollution, including effects on terrestrial and aquatic ecosystems or visibility, as compared to health based programs. As evidence on some of these effects mounted in the 1970s and 1980's Congress amended the Clean Air Act to address visibility in national parks and wilderness areas (Section 169A and B, 1977 and 1990 Amendments) and acid rain (Title IV,1990 Amendments). Both are very significant programs that effected a substantial decline in emissions of SOx and NOx that began with the acid rain program and is expected to continue over the next several decades through the regional haze rule. Nevertheless, the AQM system has not produced much beyond these explicitly mandated environmental programs. Yet, the Act also launched programs to research ecosystem health and it still retains requirements for secondary standards to protect public welfare, including the environment. The NRC AQM report recommended establishing ecosystems as an air quality management priority. It suggested that this would entail, as a first step, implementing a monitoring system to measure ecosystem health. An adequate measurement system would involve not only increasing the current number of measurement locations, but also developing meteorological and exposure models, undertaking risk assessment research and researching the interplay of ecosystems with multiple factors simultaneously, such as air quality, climate, and topography.

IV. Valued Attributes of Current SIP Program

The Subcommittee recognizes that the basic framework for the AQM system has been very successful in improving air quality.

"Between 1970 and 2005, gross domestic product increased 195 percent, vehicle miles traveled increased 178 percent, energy consumption increased 48 percent, and U.S. population grew by 42 percent. During the same time period, total emissions of the six principal air pollutants dropped by 53 percent." [1]

Emissions limits continue to be a primary mechanism for achieving significant reductions in pollutant emissions to protect the public health and restore, maintain and improve the nation's air quality.

"Two landmark events in 1970 helped to establish the basic framework for managing air quality in the United States: the enactment of the Clean Air Act Amendments and the creation of EPA. The CAA and its subsequent amendments endeavor to protect and promote public health and public welfare by pursuing the following goals:

- Mitigate potentially harmful ambient concentrations of six common pollutants: carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), ozone (O3), particulate matter (PM), and lead (Pb).
- Limit the sources of exposure to hazardous air pollutants (HAPs), also called "air toxics."
- Protect and improve visibility in wilderness areas and national parks.
- Reduce emissions of substances that cause acid deposition, specifically sulfur dioxide and nitrogen oxides (NOx).
- Curb the use of chemicals that have the potential to deplete stratospheric ozone.

The nation's AQM system operates through three broad kinds of activities: 1) setting standards and objectives, 2) designing and implementing control strategies and 3) assessing status and measuring progress." [2]

"The Clean Air Act requires the federal government to establish standards for air quality and works with partners at state and local levels to meet these standards. The CAA standards are set in a number of ways:

1) The setting of National Ambient Air Quality Standards (NAAQS) for six principal pollutants (known as criteria pollutants),
2) The setting of emissions standards for a variety of stationary and mobile sources for substances that are the criteria pollutants, their precursors, or hazardous air pollutants (HAPS),
3) Promulgate additional emission standards for HAPs that continue to pose a significant residual risk following the implementation of the first round of emission standards,
4) The setting of fuel and product reformulation standards (for example, reformulated gasoline and requirements for chlorinated fluorocarbons),

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[1] http://www.epa.gov/airtrends/2006/econ-emissions.html

[2] Air Quality Management in the United States, 2004 (p.11)

5) The setting of reduced caps for emissions of certain pollutants from certain industries (for example, sulfur dioxide [SO2] cap-and-trade program)."[3]

"The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The Clean Air Act established two types of national air quality standards, *primary* and *secondary*. *Primary* standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary* standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings."[4]

Tribal, state, and local governments must meet the established national standards for air quality. They retain the authority to go beyond the established standards, if desired.

"Areas of the country where air pollution levels persistently exceed the national ambient air quality standards may be designated 'nonattainment.'"[5]

"Once nonattainment designations take effect, the state and local governments have three years to develop implementation plans designed to meet the standards by reducing air pollutant emissions contributing to [poor air quality]."[6]

States and tribes retain primacy for implementing plans and programs to meet federal standards, including regional, state, and local control programs. This allows for approaches tailored to key air quality problems that differ regionally.

EPA establishes standards for new stationary sources (Include recommendation on how this can be strengthened to ensure that new sources – including minor sources – are well controlled and that federal control requirements are periodically reviewed and updated.)

"States seeking to clean up air pollution are sometimes unable to meet EPA's national standards because of pollution blowing in from other states. The Clean Air Act has a number of programs designed to reduce the long-range transport of pollution from one state or one region to another. The Act has provisions designed to ensure that emissions from one state are not contributing to public health problems in downwind states. It does this, in part, by requiring that each state's implementation plan contain provisions to prevent the emissions from the facilities or sources within its borders from contributing significantly to air pollution problems "downwind" – specifically in those areas that fail to meet EPA's national air quality standards. If a state has not developed the necessary plan to address this downwind pollution, EPA can compel the state to do so. If the state still does not take the necessary action, EPA can implement a federal plan to achieve the necessary emission reductions.

Also, the Act gives any state the authority to ask EPA to set emission limits for specific sources of pollution in other (upwind) states that significantly contribute to its air quality problems.

[3] Air Quality Management in the United States, 2004 (p.46)
[4] http://www.epa.gov/particles/standards.html
[5] http://www.epa.gov/oar/oaqps/greenbk/
[6] http://www.epa.gov/pmdesignations/

Under this section of the Act, States can petition EPA to require the upwind states to reduce its air pollution.

The Act also provides for interstate commissions to develop regional strategies for cleaning up air pollution. For instance, state and tribal governments from Maine to Virginia, the government of the District of Columbia, and EPA are working together through the Ozone Transport Commission (OTC) to reduce ground-level ozone in the East Coast.

The Clean Air Act also requires EPA to work with the states to reduce the regional haze that affects visibility in 156 national parks and wilderness areas, including the Grand Canyon, Yosemite, the Great Smokies and Shenandoah National Parks. Under the regional haze provisions of the Act, the states, in coordination with [EPA and other federal agencies] develop and implement air quality protection plans to reduce the pollution that causes visibility impairment. EPA has worked with states across the country to form Regional Planning Organizations to develop plans to reduce emission of pollutants that cause haze and particle pollution."[7]

"Growing populations and industrialization around the world has brought [with it] an increase in air pollution. These pollutants often originate on one continent and travel thousands of miles to impact the air quality on other continents. EPA, in partnership with countries around the world, researches how pollutants travel great distances and how they affect global climate change. Collaboration through the Intercontinental transport and Climate Affects of Air Pollutants (ICAP) project brings together top scientists from EPA and throughout the world to study these issues. Through ICAP, global transport models are being used to track where pollutants go and what can be done to reduce their levels. ICAP and similar efforts are building a scientific foundation for understanding and addressing global air quality problems."[8]

[7] Clark, Jeffrey (EPA), June 2006.
[8] Jackson, Scott (EPA), March 2006

V. Comprehensive Air Quality Management System

Recommendation: ***To improve the AQM process, EPA, States, local governments, and Tribes should move from a single pollutant approach to an integrated, multiple pollutant approach to managing air quality through creation of a comprehensive air quality management plan (comprehensive AQMP).***

The concept of a comprehensive air quality management plan, or AQMP, is to help EPA, States, local governments, and Tribes to transition from a single pollutant approach to an integrated, multiple pollutant approach that is more effective, efficient and timely in managing air quality. The AQMP would be developed at the discretion of the State or local government, or a multi-jurisdictional organization that is responsible for dealing with air quality issues in a geographic area. It is a plan that would be created at a state, local or regional level, involving many entities, outlining how the jurisdiction or jurisdictions intend to address air pollutants in an integrated manner, including attainment and maintenance of the NAAQS, sector-based reductions of criteria pollutants to protect the public health, improvements for visibility in Class I areas, strategies for reducing hazardous air pollutants (HAPs), ecosystem protection, and local environmental issues within a State.

Developing an AQMP is envisioned as a broad process that reflects significant interaction between the energy, transportation and environmental entities at the State, local and regional levels as appropriate. For a true multi-pollutant approach, all issues that relate to air quality, including energy policy, climate change, transportation, and land use would potentially be addressed in the AQMP. The goal would be to create a comprehensive plan that is multi-pollutant based, addresses all of the critical air pollution issues within a State, focuses on other important air quality goals in the geographic area, sets priorities, and provides an overall plan for moving forward with the strategies outlined in the plan.

The framework that follows provides a proposed structure and component options that a State, local government and/or multi-jurisdictional organization may consider using when attempting to develop an AQMP. The goal is to provide a template for States, local agencies and multi-jurisdictional organizations to work from, and as such covers both regulated and unregulated pollutants, since many jurisdictions are developing policies and programs affecting both. The framework is intended to be both comprehensive and flexible, i.e., it endeavors to provide a broad variety and scope of issues and topics that an entity may want to consider addressing in an AQMP, with the understanding that the entity creating the plan may choose to include or exclude any topic or issue as is appropriate for the geographic area covered by the plan. At a minimum, it is anticipated that a State government electing to prepare an AQMP will include those components relevant to the NAAQS and criteria pollutants that are to be addressed in their state implementation plan for meeting federal Clean Air Act requirements, and any pertinent state air quality requirements.

Though the current Clean Air Act currently takes a single pollutant approach for criteria pollutants (through the NAAQS), and a source sector-based approach to HAPs (through the

NESHAPs), a multi-pollutant approach to air quality management like the AQMP could offer many advantages. These may include:

1. reaching attainment in a more cost-effective, efficient way, while getting greater overall reductions of pollutants;
2. optimizing the mix of control measures for multiple pollutants, thus avoiding control measures that, while beneficial in reducing one pollutant, may result in increases in others;
3. making better use of limited Federal, State, local, and Tribal resources, and those of the regulated community, for improving air quality;
4. providing a more predictable and manageable air quality planning process than the current SIP process; and,
5. making it easier and less expensive for potentially affected sources to plan installation of controls and/or process changes, rather than having to install controls in a piece-meal fashion.

In addition, the AQMP provides a regular mechanism for providing the public with a comprehensive picture of what is happening to the air quality where they live and how the State agencies, local governments and multi-jurisdictional organizations are working together and in coordination with their Federal partners to protect the public health and ecosystems. Moreover, the AQMP helps to highlight to the public and government decision-makers where there may still be significant air quality issues that need to be addressed and help to raise the profile of these issues for consideration for further action.

Elements of an AQMP

1) Executive Summary
   a) Presents philosophy and direction
   b) Summarizes key components and discusses how they will be implemented
2) Overview
   a) Explains concept of AQMP & provides context for current plan vs the past
   b) Discusses how plan developed, who involved and process
   c) Discusses benefits and impacts of an AQMP
3) Air Quality Requirements & Goals
   a) Purpose – *why are we doing an AQMP?*
   b) Challenges
   c) Current requirements & goals addressed in the AQMP (both Federal and state/local)
4) Air Quality, Health & Ecosystem Effects
   a) Explains current air quality issues in the area covered by the plan – *what are the problems in the area?*
   b) Includes both criteria and non-criteria pollutants
   c) Discusses health effects and other issues for all pollutants covered by the plan
5) Air Emissions Assessment
   a) Provides a picture of where the area is and may be in terms of its current and future emissions inventories from all sources – *what does it look like now*?
   b) Discusses how emissions will be monitored, what modeling has been done, and what/how information is being provided to stakeholders and the public

6) Strategy for Managing Emissions from New & Existing Sources
   a) Outlines the various control strategies and other measures the area is undertaking in the stationary, area and mobile sectors – *what are we doing about it*?
   b) Covers all pollutants addressed by the plan
7) Future Air Quality
   a) Provides the future air quality picture based on implementation of the strategies and measures in the AQMP – *where do these actions get us*?
8) Implementation
   a) Explains how the organizations involved in the AQMP will execute the programs and strategies outlined in the AQMP – *how will we get this done?*
9) Looking Beyond Current Requirements
   a) Provides a forward look at air quality requirements on the horizon and how the area is approaching those issues
10) Glossary & Appendices
    a) Detailed technical support documents and information

Recommendations Related to Comprehensive AQM Planning

A comprehensive air quality management system must include systems to address the three principle components of air quality management:

- *Assessment*
- *Planning*
- *Implementation*

Recommendation: ***Improve accountability by systematically monitoring progress and evaluating results, working to ensure that data collection is meaningful and that feedback loops exist to ensure that actual environmental results inform the future allocation of resources and the establishment of priorities.***

<u>Assessment</u>

A system needs to be implemented to evaluate the threat from air pollution to public health and ecosystems and to establish priorities to address the threats. Assessment typically includes risk assessment, standard setting, monitoring, modeling, and emission inventories. Etc.

Recommendation: ***Improve the priority setting process by creating mechanisms to systematically realign resources and regulatory focus toward areas of greatest health and environmental risk.***

Recommendation: ***Implement the use of "regional airsheds" to approximate the boundaries of emission source areas most likely to contribute to nonattainment areas.***

Recommendation: ***Take climate change into account in air quality management strategies.***

Recommendation: ***Improve accountability by systematically monitoring progress and evaluating results, working to ensure that data collection is meaningful and that feedback loops exist to ensure that actual environmental results inform the future allocation of resources and the establishment of priorities.***

<u>Planning</u>

>>Short description of what we mean by planning in this context

Recommendation: ***Improve accuracy, robustness, and availability of environmental and health data to enable more complete characterization of air quality, emissions, and environmental and health outcomes and to facilitate the assessment and characterization of relative risks.***

Recommendation: ***The AQM Process should support transportation and land use planning at the multi-jurisdictional, Tribal, and local levels and other means to identify emissions reduction opportunities and improve tribal and local engagement.***

Recommendation: ***Local / Tribal governments should integrate air quality planning into their land use, transportation and community development plans when high population growth is occurring in order to prevent significant deterioration of air quality.***

Recommendation: ***Develop programs that focus on reducing public demand for polluting activities, especially non-essential activities. Such programs could include incentive programs for encouraging use of lower-polluting activities, reduction programs, and tax and use restrictions.***

Recommendation: ***Analyze existing laws to determine the extent to which they can be used to encourage pollution prevention, energy efficiency and renewable energy as they may be effective in reducing emissions.***

<u>Implementation</u>

Insert short description

Recommendation: ***Expand the use of episodic control measures to attain and maintain ambient air quality standards in areas where all reasonable continuous control measures have already been required.***

Recommendation: ***EPA should work with State air and energy organizations, Tribal governments, and regional air quality planning organizations to overcome potential barriers to clean energy/air quality integration***.

Recommendation: ***The AQM process should include incentives (including, but not limited to, more flexible forms of credit, regulatory incentives and economic incentives) for voluntary and innovative land use energy, and transportation technologies or approaches.***

Barriers to Implementation of a Comprehensive Air Quality Management System

VI. Other Recommendations

Section will include all recommendations that have substantial consensus that are not included in the Comprehensive Air Quality Planning Section.

Recommendation: ***Develop programs that focus on reducing public demand for polluting activities, especially non-essential activities. Such programs could include incentive programs for encouraging use of lower-polluting activities, reduction programs, and tax and use restrictions.***

VII. Tools

Introduction

As noted in [AQM CHALLENGES SECTION] above, today's air quality problems will pose particularly difficult and sometimes different challenges to EPA, the states and tribes than the perceived problems of past years. While our traditional air quality program has focused on reducing emissions from large stationary sources, fuels and new car and truck engines, such strategies alone are not likely to assure attainment of the nation's air quality and public health goals. To meet the next generation of air quality challenges, EPA, states and tribes must tackle emissions from existing cars and trucks (so-called "legacy fleets"), a wider range of engine and vehicle types (e.g., marine vessels), and a plethora of small and middle-size activities. Furthermore, although new engine emissions standards promise to reduce dramatically (sometimes to near zero) the emissions from new cars and trucks and from off-road vehicles and products such as lawn mowers, boats and all-terrain vehicles; the continued growth in travel and the delivery of goods spurred by increasing population and personal income will likely make it necessary to go beyond mere technology-focused strategies to address transportation, land use and energy efficiency in major metropolitan areas. Moreover, although the nation now boasts some of the world's cleanest products, fuels and vehicles, there remains much we can do to accelerate the turnover of existing fleets and to increase the penetration of the cleanest products by implementing demand-side strategies to a greater extent than in the past.

Areas of Focus - Remaining Air Quality Problems and Air Quality Planning Needs

The Committee's consideration of potential tools was guided by input from EPA regarding the most significant remaining air quality problems and regarding other types of future air quality planning needs. We focused on several types of sources, whose relatively un- or under-controlled emissions contribute significantly to ozone or fine particulate matter non-attainment in several areas of the country. Included among those categories so identified were legacy vehicle and engine fleets, ports and goods movement-related sources (e.g., trucks, ships and rail), airports, agricultural emissions, small sources (e.g., bakeries, restaurants, dry cleaners), consumer products and industrial boilers.

The Committee discussed a range of existing needs in the area of measurement. Measurement-related air quality planning needs for criteria pollutants included the need for improved baseline emissions inventory data and ambient air quality data (e.g., due to existing gaps in monitoring). Measurement and planning challenges for hazardous air pollutants were considered even more dramatic, as there is a need for data in many areas, including information regarding ambient levels of exposure to such pollutants, better risk assessment data, speciation data, improved information regarding significance levels and evaluative data regarding the potential impact of such pollutants on sensitive populations. Other identified measurement challenges included consideration of the co-benefits or impacts of various control strategies, including any potential local impacts associated with emissions trading.

The Committee discussed a number of other air quality planning challenges related to the priority problem areas, including how to ensure SIP credit for non-traditional strategies, such as diesel reduction programs or voluntary incentive programs. It recognized resource limitations faced by many state, local and tribal agencies. Finally, it recognized the current relative lack of incentives in attainment and nonattainment areas to prevent air quality problems from developing or worsening. For example, the Committee discussed the need to encourage conservation on both the user and supplier side in several priority areas, including energy efficiency and consumer travel and purchasing choices.

Many of these air quality planning challenges were addressed in the Committee's overall air quality management recommendations stated above; however, in certain instances (e.g., conservation and efficiency), the Committee also attempted to identify specific tools that could be helpful.

Potential Tools

The Committee evaluated a variety of tools that could be used to address these remaining challenges. The Committee believes that a few of these tools are likely to prove valuable in most areas of the country, for example, where there is a shared need to turn over the legacy engine fleet or to address relatively un- or under-controlled large stationary sources. But other tools may be appropriate for use only selectively in certain areas that face unique difficulties, such as ports and large airports. At large regional ports, for example, the existing and anticipated high density of engines requires that engine turnover or retrofits be accelerated and strategies should promote rapid and large-scale investment in clean fuels and technologies to attain the ozone or fine PM standards and to reduce public health risk. In such latter instances, the Committee has identified several tools that should be considered and that may offer a productive path forward. In some of these situations, the use of innovative tools, such as emissions trading, pricing or other financial strategies, may raise novel or significant public policy questions (e.g., the use of acceptable risk benchmarks, inter-pollutant trading, emissions banking and borrowing, "in lieu" compliance strategies) that would need to be considered carefully at local and regional levels.

The Committee has prepared a table of potential tools, which is presented [*below? Attachment?*]. For illustrative purposes, it also has considered a select few of the tools and has presented below both a more detailed discussion of the potential tools, of their potential benefits and of the policy and implementation issues raised.

Illustrations

(1) emission limits for industrial, commercial, residential boilers and heaters and legacy equipment and sources;
(2) financial tools for fleet turnover and diesel retrofits;
(3) information programs and
(4) financial tools for land use and transportation planning

Discussion of Relative Attributes

Include?

VIII. Coordination with other federal agencies

Recommendation: ***An inter-agency liaison group should be established with EPA and other Federal agencies (e.g., FAA, HUD, DOE, NRC, FERC, USDA, CDC, DOI, and DOT) to explore issues and opportunities for coordinating land use, energy, transportation, greenhouse gas, and air quality goals.***

IX. Statutory authority

X. Barriers

>>Include in this section a discussion of barrier/impediments to implementation, including but not limited to funding, CAA restrictions, and inertia.

X. Unresolved Issues

Unresolved Recommendation: ***Over a period of time, all sources of air pollution will demonstrate that they are achieving reasonable performance levels (RPLs) to control their emissions. The form and substance of this concept will be developed with consideration of applicable emission control regulations, technical feasibility, and costs as well as all fuel, operational, and emission control options.***

Unresolved Recommendation: ***Continuous Improvement defined as a combination of options to be considered and implemented to achieve continuous emission improvements. Recommendations range from voluntary programs at the local level to continuing a national program of command and control emission standards. Recommendations include several options for strengthening and enhancing various market-based programs to encourage continuous improvements. The subgroup feels that a one-size-fits-all recommendation cannot be made and that multiple programs should be pursued simultaneously.***

XI. Appendix

Additional Materials including meeting summaries, issue papers from teams, and additional materials housed at AQM website (Phase 1 materials). Also include Tools Inventory and a copy of the South Coast AQMP.