Air Quality Management Subcommittee Meeting

August 1-2, 2006
Denver, CO

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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
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Meeting Agenda

Tuesday, August 1

8:30-8:45	Introductions and Welcome	Greg Green and Pat Cummins
8:45 – 9:45	Air Quality in the Denver Area	Ken Lloyd, Executive Director, Regional Air Quality Council
9:45-10:00	Break	
10:00-11:00	Issues Discussion and Schedule	Greg Green and Pat Cummins
11:00-11:45	Team 2 Narrative Discussion	Anna Garcia, Bob Wyman, Debbie Wood
11:45-12:45	Lunch	
12:45-1:15	Review AQM Challenges	Michael Bradley
1:15-2:15	Discuss Statutory Authority	John Hornback
2:15-2:30	Break	
2:30-3:30	Discuss Comprehensive AQMP	John Seitz and John Hornback
3:30-4:45	Discuss Setting Air Quality Standards in an AQMP	Mark MacLeod and John Seitz
4:45-5:00	Wrap Up and Adjourn	
6:00	Group Outing	Pat Cummins

Wednesday, August 2

8:00-9:00	Assessing Air Quality	John Hornback and Dan Johnson
9:00-10:00	Continuous Improvement	Anna Garcia and Brock Nicholson
10:00-10:15	Break	
10:15-11:30	Federal & SLT Interfaces	John Seitz
11:30-12:00	Discuss Draft Report Outline	Jeff Whitlow
12:00-12:30	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 2025641663

HOTEL INFORMATION

Adam's Mark
550 Court Place, Denver, CO 80202
Hotel ph: (303) 893-3333

Photo by K.D. Stelzer

Denver Metro Air Quality

25 Years of Progress

Consider this . . . .
Back in 1975, Denver had 177 days in which its air was rated "unhealthful" or "very unhealthful," ranking the city the second dirtiest in the country behind Los Angeles and its notorious air quality problems.

By 1990, Denver area had only four such days and in 1996 the region had none.

With the submittal within the last 18 months of redesignation requests and maintenance plans for carbon monoxide, ozone and PM_{10}, the Denver region is on the verge of officially being redesignated to attainment for all health-based National Ambient Air Quality Standards (NAAQS) established by EPA. Few, if any, areas can boast of such an achievement.

How did this happen? How did the Denver metropolitan area come to be in compliance with all six criteria pollutants of the National Ambient Air Quality Standards? The story varies, depending on the source. Common themes emerge among all, including technology, environmental activism, business commitments, and local and state government leadership.

Denver's success did not occur overnight. It took many years, many committees and many commitments from citizens, local governments and businesses to make it happen. The Denver region was a pioneer in looking at different options to achieve air quality goals.

The Region Starts Taking Action

In the late 1970s, the Denver Regional Council of Governments (DRCOG) formed a Clean Air Task Force of local governments, businesses and citizen leaders to develop and recommend air quality plans for adoption by the DRCOG board and for submission to the Air Quality Control Commission (AQCC). DRCOG developed mandated state implementation plans (SIPs) for ozone, total suspended particulate matter (TSP) and carbon monoxide (CO). The ozone and TSP plans were approved by the AQCC and EPA, while the CO plan, which was unable to show attainment by the required dates, was modified by the AQCC. However, the plan was never approved by EPA.

How the Denver metropolitan area went from one of the dirtiest areas 25 years ago to one of the cleanest today.

In 1979, Dr. Jim Lents came to Colorado from Chattanooga, Tennessee, as head of the state's Air Pollution Control Division (APCD). He knew his task was formidable.

One of his first responsibilities was to start an inspection and maintenance program (I/M program) in the Denver area to deal with Denver emissions' contribution to air pollution. It was a fierce battle, even in those days, and the state legislature initially balked at passing legislation authorizing the I/M program. EPA, however, imposed highway funding sanctions allowed by the Clean Air Act and the legislature reluctantly enacted a program that began in 1981.

The next battle that the Denver metropolitan area faced was at the national level, when EPA initially decided not to strengthen carbon monoxide tailpipe standards for automobiles. Lents and others knew the region would never come into attainment for CO without the tougher standards.

Colorado, which had produced a report about how the new standards would improve air quality and would help the state meet air quality standards, led the fight at the national level for tougher standards. Lents urged his colleagues in other states to develop similar reports. The states' outpouring of support for the new standards convinced EPA to set tighter standards, which paid important dividends in Denver and other areas a decade later.

Better Air Campaign

To complement the air quality planning and technical issues that the state and others were pursuing, the APCD developed the "Better Air Campaign" to urge citizens to reduce driving. The campaign was conceived as a way to reduce carbon monoxide during the worst months—November through January.

The Better Air Campaign received national attention, since no other city had asked its citizens to voluntarily not drive alone one day a week. The goal was to reduce CO by 10 percent so Denver could attain air quality standards. A poll showed that people were willing to give up driving alone one day a week so the state proceeded with the campaign. For instance, if it was Monday and your license plate ended in a 0 or 1, you were asked not to drive that day, find alternate transportation or work from home.

The program lasted for three years, but was abandoned after an evaluation showed

the campaign was not successful in achieving its stated goals. The program became complicated to maintain and was becoming increasingly controversial. However, parts of the campaign that were successful still are used today, including issuing daily advisories to let the public know if the air quality is good or bad and an increased awareness of air quality issues. The campaign showed that, although some ideas were good, many people were not willing to change their driving or working habits to improve the air.

The Business Community Steps Forward

By the mid-1980s, the Denver area was making progress, but the region still was plagued by the highest CO levels in the country and the infamous Brown Cloud. After the Broncos first unsuccessful trip to the Super Bowl, a national TV report concluded, "At least Denver is number one in something—the highest carbon monoxide levels in the country."

Such examples of a negative national perception resulting from poor air quality led the region's business and political leaders to take more aggressive action.

The Metro Denver Chamber of Commerce, under the leadership of President Dick Fleming, made improved air quality the number one business priority in the region.

Ben Bryan, manager of public affairs for the Chamber at the time, was the business community's point person for air quality. He credits the mountains and the scenery—so important to the region's image—among the motivating factors for businesses to take the initiative for air quality.

"Many business people knew the paradox," said Bryan, now in the commercial real estate business in the area. "Denver has this incredible backdrop and all this air pollution was obscuring it. It not only was tarnishing Denver's image, but also was affecting the city's ability to recruit new businesses. Additionally, Denver's quality of life separates it from other cities, so how can you be serious about that and not address air quality."

Jim Scherer, current Chairman of the RAQC, was EPA's Region VIII administrator in the late 1980s. EPA was closely watching the efforts of Denver and other cities.

"EPA tried to encourage all areas to reduce pollution and make progress in improving air quality," said Scherer. "Denver responded because there was important local government efforts and leading business people who helped make a difference."

"Businesses realized that it cost more to do nothing about the Brown Cloud than to participate and improve air quality. There was reluctance on the part of some businesses to participate, but it was clear that Denver's reputation was hurting because of air quality."

In 1985, Governor Richard Lamm, with support from Denver Mayor Federico Peña, members of the business community, and environmentalists, formed the Metropolitan Air Quality Council (MAQC) to take a much more activist approach to solving the metro area's air quality problems. The MAQC was composed of local elected officials, business leaders, citizens, environmentalists and legislators.

During its tenure, the MAQC worked hard to increase the public's awareness of air quality, health and visibility impacts. The MAQC also was active in promoting oxygenated fuels, local woodburning ordinances, and a diesel inspection/maintenance program.

"Oxygenated gasoline was a big step for Colorado," said Dr. Lents, who left Colorado in 1986 for an even bigger challenge as executive director of the South Coast Air Quality Management District in Los Angeles. " We were the first state to research the use of oxygenates in gasoline and recognize the benefit."

1987-1988 Brown Cloud Study

One of the MAQC's most controversial recommendations was a proposal to convert the metro area's coal-fired power plants to cleaner-burning natural gas. Although obviously supported by the region's natural gas industry and environmentalists, the proposal was vigorously opposed by Public Service Company—which said the plan was too expensive—and western Colorado coal interests. The debate led to the 1987-1988 Brown Cloud Study, a $1.5 million effort funded almost entirely by the private sector but managed by a public/private partnership.

The study provided state-of-the-art, scientific and cost benefit information to aid air quality planning efforts in the region.

An important conclusion from the Brown Cloud Study was that power plants were not the only—or even the principal—culprits of the brown cloud and air pollution. The study pointed out that woodburning, street sanding and mobile sources were significant contributors and concluded that reductions in these emissions could help reduce the brown cloud for a relatively low cost. The study helped set the tone and efforts of air pollution reduction efforts for the next decade.

"The Brown Cloud Study really shifted the debate about air quality from power plants to more cost effective pollution reductions from woodburning, street sanding and other mobile source reductions," remarked Ben Bryan, who co-chaired the effort.

Based on the results from the Brown Cloud Study, in 1989 the state legislature passed SB 77, which included significant new initiatives for air quality in the region. Chief among these was direction to the Air Quality Control Commission to establish a visibility standard for the Front Range. After conducting an innovative public process to determine acceptable levels of visual air quality, the AQCC established the nation's first urban visibility standard in 1989.

Progress Continues During the 1990s

In 1989, at the urging of local governments and businesses who were feeling increasingly alienated by the MAQC process, Governor Roy Romer decided to take a different approach and formed the Regional Air Quality Council (RAQC). The new organization was intended to have significantly more local government participation with sound technical planning, while still maintaining a strong advocacy role. The RAQC initially was composed of 31 members, more than half of whom were local elected officials; the remaining members were business leaders, legislators, environmentalists and citizens.

Much of the RAQC's initial focus was placed upon efforts that could be implemented by local governments working together—principally in the areas of woodburning, street sanding, alternative fuels, and transportation.

Local and state efforts strengthened local woodburning ordinances and eliminated conventional fireplaces in new construction. Studies showed that through these combined efforts the contribution of woodburning to air pollution in the region dropped precipitously. The RAQC also worked with state and local street maintenance departments to develop guidelines and programs to reduce street sanding in the region. Since 1989, the amount of sand applied in the region has been reduced by more than 50 percent. From 1995 to 2000, local sanding agencies increased sweeping of streets by 50 percent.

"When local governments got together to tackle air quality issues, we were able to make big improvements," said Don Parsons, mayor of Northglenn and current vice-chairman of the RAQC . "Local governments also talked about issues collectively—we did not target one city or one industry. We decided together what we should do and how to approach the air quality problems."

The RAQC also spent the first half of the decade implementing the planning requirements of the far-reaching Clean Air Act Amendments passed by Congress in 1990. Building on ongoing local efforts, the RAQC and the Colorado Department of Public Health and Environment prepared attainment plans for CO and PM_{10} that were ultimately approved by EPA. For the first time ever, the Denver region had plans in place that were fully approved by EPA.

The Blueprint for Clean Air

Many people became frustrated with the mandatory SIP process, which focused on single pollutants, short time frames and federal mandates. Instead, many wanted to take a comprehensive, long-range look at air quality in the region through a more flexible, incentive-driven approach. As a result, in 1996 the RAQC launched the *Blueprint for Clean Air*, a comprehensive, long-term evaluation of the strategies that need to be implemented so Denver can maintain its air quality gains over the next 20 years. More than 400 people participated in committees and subcommittees, with all meetings open to the public. It brought together all groups and interests to develop a forward-thinking plan.

About the same time, the state legislature initiated the Northern Front Range Air Quality Study (NFRAQS), a $3 million study managed by Colorado State University and funded primarily by the private sector. The study looked at $PM_{2.5}$ concentrations throughout the northern Front Range and concluded that mobile sources (gasoline vehicles, smoking vehicles, diesel vehicles, and street sanding) directly or indirectly make up 75 percent of the $PM_{2.5}$ pollution. Like the Denver Brown Cloud Study a decade earlier, NFRAQS provided information that will aid air quality planning efforts for years to come.

The *Blueprint for Clean Air* was released in January 1999. The *Blueprint* contained a series of recommendations designed to keep the Denver region in attainment with federal air quality standards for the next 20 years and to reduce the number of poor visibility days by nearly 50 percent. The *Blueprint's* recommendations included those shown in the box below.

In 1999, Xcel Energy (formerly Public Service Company) finalized an agreement with the state, whereby the utility will undertake a voluntary program to reduce sulfur dioxide (SO_2) emissions by 70 percent and nitrogen oxide (NOx) emissions by 20 percent from its three metro area power plants. This agreement goes well beyond current regulatory requirements.

The Denver Region Seeks Official Redesignation to Attainment

Also in 1999, Governor Bill Owens reorganized and streamlined the Regional Air Quality Council and directed it to focus on completing the process for redesignating the Denver region to attainment status for all federal health standards. The critical part of this process was developing long-term maintenance plans that will ensure continued attainment of the standards.

Based on the RAQC's work, the Governor submitted maintenance plans and redesignation requests for carbon monoxide in May 2000, one-hour ozone in March 2001, and PM_{10} , in July 2001. The plans are awaiting final EPA approval before the area can officially be declared in attainment for the pollutants.

The Governor also asked the RAQC to evaluate the current automobile inspection/maintenance program and to recommend options for improving it. The RAQC recommended adding a clean screen remote-sensing component to the program that would exempt identified clean cars from routine testings, which was authorized by the General Assembly in legislation passed in 2001. The RAQC also recommended paying more attention to high-emitting vehicles that still are operating on the roadways.

Blueprint for Clean Air Recommendations

•Reduce uncontrolled sulfur dioxide emissions by 70 percent and nitrogen oxide emissions by 20 percent from Public Service Company's coal-fired, metro area power plants.

•Improve the state's inspection and maintenance program for diesel vehicles.

•Reduce street sanding, increase the use of alternatives to sand, and/or increase sweeping to avoid increases in mobile source PM_{10} emissions.

•Implement DRCOG's Metro Vision land use and transportation plan for the metropolitan area in order to reduce vehicle travel.

•Develop a carbon monoxide maintenance plan and redesignation request for the region and evaluate the future direction of the oxygenated fuels and vehicle inspection/maintenance program.

•Increase efforts to reduce emissions from smoking vehicles.

•Evaluate federal proposals to tighten emission standards for cars and trucks.

•Advocate for strategies that make sense for the metro area.

•Take short-term, voluntary actions to guard against violations of the new ozone standard.

•Implement voluntary and incentive programs to reduce pollution.

Future Challenges Remain

Despite the tremendous accomplishments that have been made, future air challenges remain for the Denver metro area. Although overall air quality projections over the next 20 years still look favorable, the region will need to continue to take positive, proactive steps to maintain federal health standards and reduce the brown cloud.

During the next 20 years, the metropolitan area is expected to add another million people to its population. The amount of driving during this period will increase by 60 percent, to more than 90 million miles per day.

In addition, EPA has set tougher new standards for ozone and $PM_{2.5}$, which will create a sizeable challenge for many areas of the country. Although the Denver region expects to remain below these standards, there is not much cushion, and the region will need to remain vigilant in its air quality programs.

Helping meet these future challenges will be tougher EPA standards for cars, trucks and small engines. Beginning in 2004, tighter standards and cleaner gasoline for cars, light-duty trucks and sport utility vehicles will take effect. Likewise, in 2007 stricter standards and cleaner fuels will significantly reduce emissions from diesel trucks and buses.

The special qualities of the Denver area, with its unique mountain backdrop and its respect for the beauty that surrounds it, have compelled its local officials, the business community and citizens to be pioneers in improving air quality. By being the first area to implement cutting edge technology, products and air quality improvement methods, the Denver area has paved the way for other cities to reduce pollution. Whether it was being the first to ban non-certified woodburning stoves, being an early adopter of alternative deicer materials instead of sand, or being the first to study and use oxygenated fuels, the Denver metropolitan area now can applaud its collective efforts as it also remains steadfast in its efforts to reduce air pollution.

REGIONAL AIR QUALITY COUNCIL
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Successful Strategy Timeline

1981	Instituted an automobile inspection and maintenance program that required vehicles to pass an emission test.
1982	Ozone State Implementation Plan submitted to EPA.
1985	Set emissions standards for new woodburning stoves sold in the state.
1986	Modified the automobile inspection and maintenance program to make enforcement registration based.
1987	Created mandatory, centralized diesel inspection and maintenance programs requiring individual diesel vehicles and diesel fleets to comply with emissions standards.
1988	Enacted the first oxygenated gasoline program in the United States, requiring their use in cars along the Front Range to reduce carbon monoxide levels in the air during the winter.
	Attained federal 1-hour ozone standard.
	Completed 1987-1988 Denver Brown Cloud Study.
1990	Adopted an urban visibility standard in response to state legislation. This first urban visibility standard in the United States triggered restrictions on the use of woodburning devices on days the standard was likely to be exceeded.
	Banned the sale of non EPA-certified stoves in the state.
1991	Adopted guidelines for reducing street sanding emissions from roadways.
1993	Local governments enacted ordinances in the Denver metropolitan area banning conventional woodburning fireplaces in all new housing, limiting such devices to natural gas or EPA-certified stoves. The Denver metropolitan area was the first major metropolitan area in the United States to ban the installation of new woodburning fireplaces and restrict woodburning in existing fireplaces and stoves on high pollution days.
	PM_{10} State Implementation Plan submitted to EPA.
1994	Carbon monoxide State Implementation Plan submitted to EPA.
1995	Replaced the existing inspection and maintenance program with a newer, centralized and technologically advanced program.
	Attained PM_{10} standard.
1996	Initiated Northern Front Range Air Quality Study and *Blueprint for Clean Air* long-range air quality plan.
1997	Attained carbon monoxide standard.
1999	Xcel Energy (formerly Public Service Company) entered into a voluntary agreement with the state to reduce emissions from three metropolitan area power plants.
	Initiated region's first summertime Voluntary Ozone Reduction Program in response to EPA's new 8-hour ozone standard.
	Legislation passed creating tax incentives for alternative fueled vehicles.
2000	Submitted carbon monoxide maintenance plan and redesignation request.
2001	Submitted one-hour ozone and PM_{10} maintenance plans and redesignation requests.
	Legislation enacted to extend the automobile inspection and maintenance program and to implement the clean screen program.

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Issues for Discussion

** This document is a guide for the Subcommittee discussions beginning at 1:15 PM on August .*

Discussion Facilitator(s) – John Hornback

Statutory authority – Some subcommittee participants have suggested that recommending changes to the CAA should be avoided. Isn't it likely that there are some critical recommendations that are important enough to pursue, even if CAA amendments would be required? Answering this question will help in the final review of recommendations throughout the Phase II report.

Discussion Facilitator(s) – John Seitz

Comprehensive Air Quality Management Plan – What should be considered integral components of our recommended AQMP? Are the subject areas already in discussion adequate, or should the concept be bolstered with additional or expanded issues? What needs to be incorporated to make the AQMP concept the most effective tool that it can be? (Most of the additional issues below are potential components or at least support the AQMP concept.)

Discussion Facilitator(s) – Mark MacLeod and John Seitz

Setting air quality standards – The 5 year NAAQS review cycle conflicts with the realities of current SIP development obligations. Is there a way to modify the approach to SIPs through the AQMP to remove these conflicts? Should we be recommending an extended schedule for NAAQS reviews and implementation deadlines that reflects the realities of current and/or future S/L/T agency processes? A longer schedule may be more realistic unless something can be done to shorten the SIP process currently being used. We really don't need overlapping standard obligations that compete for time and don't make sense from a public standpoint. In a business, one would not operate this way.

Discussion Facilitator(s) – Dan Johnson and John Hornback

1. Assessing air quality – monitoring – Are we doing enough monitoring in each state to make accurate declarations of the status of air quality relative to each pollutant of concern? Can we eliminate disincentives to monitoring? Are there cheaper approaches to monitoring that could provide opportunities for more extensive monitoring within monitoring budget caps? Should we be more thoroughly evaluating air quality in each state through revisions to monitoring plans that will allow air quality, including air toxics, to be more comprehensively characterized?

2. Assessing air quality – attainment/nonattainment determinations – Have we adequately discussed and decided on a future approach to attainment boundaries? We know the area of violation/area of influence concept have merit. Can areas that are truly subject to the emissions of others be exempted from some of the substantial requirements that are normally mandated on all nonattainment areas? Is the AOV/AOI approach one that we could recommend?

Discussion Facilitator(s) – Anna Garcia and Brock Nicholson

Continuous improvement – Has this issue been sufficiently discussed or are there details still to work out? Continuous improvement appears to be an inherent part the current SIP process due to periodic ratcheting down of standards and emission limits. Is further discussion appropriate?

Discussion Facilitator(s) – John Seitz

Federal/state/local/tribal interfaces – How can enforceable federal mandates be designed for use by S/L/Ts more efficiently? Could more federal programs be set up like Title IV that required less S/L/T action? What about SIP approvals and federal enforceability? Can federal enforceability be achieved in a more simplified manner? Can the administrative requirements for SIP approval be streamlined (beyond what was discussed in the Phase I process) or even eliminated? Shouldn't we explore every alternative to determine feasibility for simplifying the federal enforceability/SIP adoption process?

Potential Issues for Future Discussion

Setting priorities – Does the latitude exist to prioritize activities and target efforts? If all standards (NAAQS) and goals (regional haze) must stand on their own statutory and/or regulatory mandate, how is prioritization even possible? Presuming that prioritization is not possible, what can be done to allow bundled multi-pollutant approaches to AQM in the future? Isn't there still a need for a multi-pollutant approach to future AQM? Nearly every review in recent years has concluded that this should be done.

State/local/tribal initiatives and authorities – How can S/L/T initiatives be better supported at the federal level? Can provisions be eliminated from future federal promulgations that limit the abilities of S/L/T agencies to be more stringent? Can safe-harbor provisions be excluded from federal regulations and enforcement settlements? This may be as much a political issue as anything else since it seems that these situations develop through carefully negotiated agreements between the regulated community and EPA.

Additional emission reductions – Are there categories of emission reductions that need to be addressed here? The largest remaining emission sources after Title IV, the NOx SIP call, and CAIR will continue to be EGUs followed by industrial boilers. Both of these were discussed in Phase I with presumptions that at least ICI boilers would be addressed within 18 months. That did not happen. Should this group recommend new national or regional rules specifically targeting reductions in inadequately controlled EGUs and ICI boilers? If further progress is to be made in achieving and maintaining compliance with NAAQS and risk standards, the largest emissions remaining categories must continue to get attention. Is this a local, regional, or national issue?

DRAFT – This is a draft report section under consideration by the AQM Subcommittee.

Air Quality Management SubCommittee
Michael Bradley & John Bachman

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 $PM_{2.5}$ 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 $PM_{2.5}$ 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 NO_x, SO_x, 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 $PM_{2.5,}$ SO_2, NO_x, 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.

---------- *Draft AQM Subcommittee Report Outline* ----------

AQM Subcommittee Phase II Report
July 27, 2006

* This is based on the outline the subcommittee reviewed at its Atlanta meeting. The drafting team has been working since the Atlanta meeting to refine and fill-in the outline.

I. Introduction

II. Background

III. Challenges for Air Quality Management

* authored by Michael Bradley and John Bachmann. The current draft proceeds this outline in the notebook.

IV. Valued Attributes of Current SIP Program

V. Comprehensive Air Quality Management Planning

- Issue Group 2: 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).
- Issue Group 1: 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.

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

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

>>Note that these are the primary components of SIPs, but SIPs are limited to criteria pollutants and further constrained by Clean Air Act restrictions.
>>Show how these components relate to each other in a feedback loop:
Assessment -> Planning -> Implementation -> Assessment…..

Recommendations related to ***Assessment***

>> Short description, something like: 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 2: Setting Air Quality Standards
- Issue Group 1: Improve the priority setting process by creating mechanisms to systematically realign resources and regulatory focus toward areas of greatest health and environmental risk.

Recommendation 3: Assessing Air Quality
- Issue Group 2: Implement the use of "regional airsheds" to approximate the boundaries of emission source areas most likely to contribute to nonattainment areas
- Issue Group 3: Take climate change into account in air quality management strategies.

Recommendation 4: Setting Priorities for AQMPs
-Issue Group 1: 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.

Recommendations related to ***Planning***

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

Recommendation 5: Interfaces between federal and state/local/tribal actions
-Issue Group 1: 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 6: State/local/tribal regulatory

Recommendation 7: Interfaces with other important planning areas

Recommendation 8: Schedule for AQMP work
- Comprehensive AQM Planning
- Issue Group 1: 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.

Recommendations related to ***Implementation***

>>(e.g., the roadmap, timeline, implementation strategy, etc.)

Short description of what we mean by implementation in this context

Recommendation 9: Strategies for achieving additional emission reductions
- Issue Group 2: 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.
- Issue Group 2: Continuous Improvement
- Issue Group 2: 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.-
Issue Group 2: 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. - Issue Group 3: 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.
- Issue Group 3: Analyze exiting 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.
- Issue Group 3: 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 10: Incentives
- Issue Group 3: 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.
- Issue Group 3: 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.

VI. Tools

VII. Coordination with other federal agencies

- Issue Group 3: 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.

VIII. Statutory authority

VIII. Barriers

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

Appendix: Final Papers from Team 1

Issue Group 1

(minor change to Recommendation 2 since Atlanta Meeting)

Defining the Problem and Setting the Right Priorities
Team 1 Group 1
Recommendation #1
June 19, 2006

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.

Background/Explanation: In order to improve the air quality management system's ability to focus on the most important priorities, data needs to be continuously improved. Science is always improving our understanding of air pollution and its impacts on public health and the environment. Several of these recommendations are carried over or expansions of recommendation made in Phase 1 AQM report.

NAS Recommendation Addressed: Recommendation 1: Strengthen Scientific and Technical Capacity

Scenario: Mixed – Scenario 1 unless otherwise indicated.

Recommended Actions:

1. Improve air quality data – continually improve air quality monitoring network to collect data on pollutants of concern, in areas of concern:

- Action 1. EPA has already proposed to work with states, locals, tribes and other stakeholders to review the national monitoring system. EPA should revise monitoring requirements as appropriate and in as timely a manner as possible to allow states to shift resources in line with results of review.
- Action 2. EPA should provide better outreach and establish a category of monitoring devices (or practices) that can be used for research, informational, policy-setting, and public information purposes but will not be used to set nonattainment boundaries or bring other regulatory programs into play and work with states, locals, tribes and other stakeholders. (Scenario 2 and 3)
- Action 3. EPA, in partnership with other Federal agencies, should develop a more integrated observation strategy that addresses gaps in rural and elevated observations critical to supporting ecosystem, regional and intercontinental transport assessments. As part of this strategy, the incorporation of emerging environmental data sets from satellites, air quality forecasting and chemical data assimilation (i.e., integration of models and observations) should be tasked as a requisite for advancing air quality assessment capabilities over the next several decades.

2. Fill gaps in emissions inventories and air quality modeling:

- Action 4. Target resources towards the improvement, demonstration and development of CEMS technology to make it more cost-effective and more accurate, especially for appropriate emission sources for which CEMS technology is not currently available, accurate or within reasonable costs. EPA should

encourage CEMS or alternate emission estimations technology for the pollutant of interest (not a surrogate) as the default compliance monitoring technology using incentives for future rules. This may not be applicable or appropriate for smaller areas sources. (Scenario 2)

- Action 5. EPA should develop adequate emissions infrastructure so emissions estimates can be shared across stakeholders (S/L/T and industry). Focus should be on improving information and emission numbers in inventory.
- Action 6. States should be required to provide multipollutant (including HAPs) and speciated information as available to the National Emission Inventory. Some states already provide or collect this information, but not all.
- Action 7. Emphasize the use of air quality models to evaluate current conditions as well as project future scenarios, and then evaluate those results for corrections to models or approaches if projections not met. Models provide a needed complement to data in accountability assessments in which reconstructed modeling of past years allows for checking original assumptions and success of rule implementation. In addition, models should be used in combinations with observations to evaluate and improve emissions estimates through inverse modeling procedures.
- Action 8. Develop the needed interfaces between air quality and watershed and terrestrial models to better link air program rules with deposition related impacts on ecosystems.
- Action 9. Use current air quality models to quantify co-benefits across multiple pollutant categories, recognizing the limitations (due to scarcity) of ambient data to address interactions of HAPs with PM and ozone.
- Action 10. Integrate models and ambient data to provide more robust, spatially, temporally and compositionally enhanced air quality surfaces for accountability, regulatory, ecosystem and health assessments.

3. Improve information on health and ecosystem endpoints and relative risk of exposure to single and multiple pollutants, at the individual, population, and ecosystem levels.

- Action 11. EPA should focus on improving methodologies to address uncertainty (e.g., uncertainties in extrapolating high to low dose exposures, from animal studies to human impacts, or laboratory to field).
- Action 12. EPA and other Agencies should redesign research and grant programs to encourage the timely targeting of key issues and more flexibility to shift resources in the face of new problems or priorities.
- Action 13. EPA should work with CDC, S/L/Ts, other agencies and stakeholders to improve indicators that can be used to assess the impact of changes in air quality on public health and ecosystem health. These agencies should encourage research in areas that will help develop indicators to assess the success of various programs.

4. Improve coordination and communication between EPA and external partners, including health agencies, academic institutions, and the medical community.

- Action 14. States, Tribes, EPA and CDC should periodically hold national and/or regional joint environmental health summits on a regular schedule to evaluate current priorities and identify new issues.
- Action 15. States, Tribes, EPA, Federal Land Managers, and other agencies, should periodically hold national and/or regional joint ecosystem health summits on a regular schedule to evaluate current priorities and identify new issues.
- Action 16. S/L/T environmental agencies should work actively to increase coordination with appropriate health agencies.
- Action 17. State health agencies should be involved in developing State air quality management plans. (Scenario 2)
- Action 18. EPA should improve the availability of reports, studies and data in whatever format on the impacts of air pollution and air pollution control programs on health, agriculture and ecosystem quality to S/L/T agencies, other stakeholders and the public. This could include a library established on an EPA webpage, a regular listing of recent studies, links to other internet sources of information such as STAPPA/ALAPCO.

Implementation: Many of these actions are already in progress; however some will require additional effort. The primary constraint is resources both funding and FTE for actions such as inventories, modeling and monitoring.

Benefits: Improved air quality data and information on which to base decisions related to control strategies, evaluate the results of implemented strategies and make changes as needed to improve air quality resulting in improved public health and health of the environment. In addition, improved communication with multiple parties to ensure that information is shared and used to enhance program results.

Sectors/Categories Recommendation Applies to: all

Tools Needed: to be incorporated

Priority: High

Defining the Problem and Setting the Right Priorities
Team 1 Group 1
Recommendation #2
July 17, 2006

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

Background/Explanation: The air quality management system has been operating in a "stovepipe" process for a while, and in order to address the air quality issues of the future needs to realign to an approach which more effectively addressed the interaction of multiple pollutants. While progress has been made in addressing some multistate transport of air pollution, transport issues still need to be identified and proactively addressed. Urban areas also have a mix of emissions which may be more appropriately addressed in a multipollutant fashion than individually.

Problem/Challenges Addressed:

- The need to be able to address new priorities promptly
- Identification and assessment of most significant exposures and problems
- Integration of a multipollutant approach

NAS Recommendation Addressed: Recommendation 1. Strengthen Scientific and Technical Capacity; Recommendation 2. Expand National and Multistate Control Strategies; Recommendation 3. Transform the SIP process; Recommendation 4. Develop Integrated Program for Hazardous Air Pollutants; and Recommendation 5. Enhance Protection of Ecosystems and Public Welfare

Scenario: Noted after each recommendation – primarily Scenario 1 with a few exceptions.

Recommended Actions:

- Action 1. EPA should use the updated information provided by the S/L/Ts in their air quality management planning process to develop national regulatory priorities. EPA should also, through modeling and monitoring, help define problems that occur on a national scale which can be used to support S/L/T plans. (Scenario 1)
- Action 2. EPA should start discussions with CDC and State health agencies to determine if they want to partner to see what is feasible for producing an Air Quality Health Trends report eventually would link changes in ambient air quality to health data on a 5-year cycle, using the best available information and recognizing the limitations of those data. (Scenario 1)
- Action 3. EPA, the Federal Land Managers, and other agencies, working with S/L/T should report on links between ambient air quality and the "health" quality

of ecosystems on a 5-year cycle, using the best available information and recognizing the limitations of those data. (Scenario 1)

- Action 4. EPA and other stakeholders should improve the link from improved science to improved policy by developing new mechanisms to encourage more rapid adjustment of policy priorities in the face of new scientific information than has been done historically. EPA should seek new incentives and hammers to encourage the realignment of regulatory priorities and implementation efforts to deal with the highest priority problems, both within the agency and among States. What are the most effective approaches - command and control versus incentives or something else? (Scenario3)

Implementation: The primary obstacle to implementation will be resources for developing outputs either reports or model information. There will be difficulty for many states to develop overall air quality management plans without some federal regulatory requirement to do such.

Benefits:

- Will produce a more comprehensive approach to improving air quality than the stovepipe approach taken now, as pollutant interactions will be considered more
- Will allow S/L/T to more quickly shift resources to areas of higher priority
- Improved communication with the public on the status of health and the ecosystem as a result of air quality impacts

Sectors/Categories Recommendation Applies to: All

Tools Needed:

- Will require improved modeling and monitoring for integrated pollutant evaluations.
- Will require toolbox of incentives or approaches to encourage realignment of program priorities as needed

Priority: High

Defining the Problem and Setting the Right Priorities
Recommendation #3
Team 1 Group 3
June 19, 2006

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.***

Background/Explanation: The air quality management system must include an ongoing process for of accountability, evaluating progress and developing ways to make adjustments in activities and resource allocation based on the success or failure of existing programs. Part of this process involves continuing investments in strong technical tools, such as modeling, monitoring, and emissions inventory capabilities, to ensure decisions are informed by the best possible new information. AQM Phase 1 focused on needs in this area. In addition, it is important to evaluate program performance relative to air quality and cost-benefit goals, and to adjust program efforts and priorities according to the results of that assessment if and as appropriate.

In the past, EPA has had difficulty shifting resources and programmatic momentum in the face of new problems. For example, EPA first promulgated a fine particle ambient air quality standard in 1997 (after a number of years of evaluating available health data that indicated fine particles posed a more significant health risk than many other air pollutants of concern). However, areas were not designated attainment or nonattainment until late 2004; SIPs aren't due until 2007; and the first attainment deadlines are in 2009. Although fine particles pose, in most people's view, a more serious and pervasive threat to public health than ozone, states continue to devote substantial resources to ozone—indeed ozone is "first in line" because of statutory deadlines. States are trying to employ sensible efforts to combine ozone and fine particle planning and reduction programs, but the rigid statutory structure and deadlines make it difficult.

Even when targeted programs are developed to tackle a specific problem, measuring progress accurately and assuring that we are actually reducing the targeted pollutants and improving public and ecosystem health can be difficult. Current ways of measuring progress are slow and, in some cases, not very accurate.[1]

In sum, the current system is extremely cumbersome when faced with new information about health and air pollution priorities, no matter how compelling the evidence is (unless an issue prompts congressional or state legislative action, in which case resources are diverted promptly, maybe even precipitously).

Problems/challenges Addressed:

[1] For example, compiling emissions inventory information to determine whether emission reduction programs have been effective can take several years and, unless continuous emissions monitoring systems are available, may be little more than estimates based on previously estimated emissions and updated economic activity predictions.

1. The need to be able to address new priorities promptly.
2. Lack of confidence in the effectiveness of pollution reduction programs because of weak accountability systems (and therefore potentially lack of support for continuing or future programs)

NAS Recommendation Addressed: This recommendation is consistent with the following recommendations of the NAS report:

1. Strengthen the scientific and technical capacity of the AQM system to assess risk and track progress;
3. Transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan (AQMP) process;
4. Develop an integrated program for criteria pollutants and hazardous air pollutants; and 5. Enhance protection of ecosystems and other aspects of public welfare.)

Scenario: Actions 1-2 listed below could be readily accomplished within the current structure of the Clean Air Act and therefore fall in Scenario 1. Several of these recommended actions are similar to, reinforce and continue some of the longer term recommendations made during Phase I of the AQM process.

Recommended Actions:

- Action 1: Make information available to CASAC, S/L/T and the public on an ongoing basis about significant new research and studies on the health, welfare and ecosystem impacts of air pollution. Provide a summary of significant new studies annually to the CASAC and to the CAAAC. Publish a summary in the Federal Register and prominently on the EPA website. (Scenario 1)
- Action 2: EPA and S/L/T should work to "design for accountability" (Scenario 1):
    - EPA and other stakeholders should embed metrics and schedules for tracking progress within programs and rules at the time they are initiated. Using these metrics, EPA and S/L/T should evaluate the progress that is being made under various regulatory control programs, by assessing compliance rates, actual reductions achieved, and in practice cost-benefit analysis.
    - EPA and other stakeholders should improve the collection of control and cost data to facilitate analysis of both projected and actual implementation costs for major regulations, as follows:
        - EPA should develop an improved means of assessing actual compliance technologies chosen and actual costs associated with implementation of air pollution control efforts. Prospective modeling to estimate costs in advance of new rules should be matched with retrospective analysis of actual implementation costs, so that results and impacts can be assessed more accurately.

        - EPA and S/L/T should invest jointly in a complete, up-to-date system to catalog pollution control technologies available and the associated costs.
    - EPA and other stakeholders should improve the assessment of the benefits—both prospective and retrospective—associated with avoiding air pollution-related health impacts and premature mortality, ecosystem damage, agricultural impacts and other public welfare impacts.
    - Pollution control information and cost-benefit calculations should be combined with the information in EPA's Trends Reports to produce a more comprehensive "accountability" assessment that tracks program progress in a transparent and publicly accessible way.
    - Initial accountability efforts should focus on major rules such as CAIR, CAMR and mobile source rules, but accountability metrics should ultimately be incorporated into all types of programs.

Implementation: The actions recommended here are resource-intensive and technically challenging (or we would probably have done them by now), and could be seen as shifting resources to accounting for progress instead of working on programs that will actually improve air quality.

Benefits: The public will benefit if regulators are focusing on the more important public health issues and have more flexibility to respond to newly developed information. Publicizing significant new health and ecosystem studies on a regular basis will increase focus on public health and environmental goals and should help streamline the review/revision of primary standards and enable the development of meaningful secondary standards that will protect ecosystems. Furthermore, ongoing efforts to track effectiveness and cost/benefit results of programs should enhance program design and effectiveness in the future. Accountability is always necessary to ensure public resources are being used to the greatest purpose, to assure confidence in the need for current and future programs.

Sectors/Categories Recommendation Applies to: These recommendations do not apply to specific sectors or categories.

Tools Needed: Tools include emissions inventory tools, tools to link health effects and air pollution exposure, risk assessment tools, tools to collect real cost and benefit data from implemented programs.

Priority: [ ]

Appendix: Final Papers from Team 1 Issue Group 2

(RPLs is now a draft concept paper to be used to document discussions, the local planning paper's first paragraph has a minor change, changes have been made to the paper on continuous improvement, no changes to Boundaries , caveat added to third recommendation in the episodic control paper)

Reasonable Emissions Controls
Team 1 Group 2
July 17, 2006
!!! Preliminary draft 2!!!

This is language that is to go into the report, not as a recommendation since there was no consensus. It is a report of considerable dialogue on this subject to show that a number of members of the sub-committee believe this concept is worthy of serious consideration in the future.

Transforming the Air Quality Management System – a Long-term Vision

Overarching Vision

The idea that we should treat the air as a finite resource – that is, a resource that has limited capacity to assimilate pollution – is contained in the opening section of the Clean Air Act. That section lays out the fundamental purpose of the Clean Air Act to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare…"

One vision for managing air quality in the coming decades is to treat airsheds as resources owned by, and managed for, the benefit of the public, where all sources of air pollution are considered users of a finite and essential resource, and no air pollution source owns an entitlement to emit pollutants into the air without express consent to do so.

The air quality management framework that emerges from this vision is one in which it is established up front the conditions under which sources may emit pollutants into airsheds, in contrast to the current framework where the burden is on the public and the governments that represent them to show that there is a problem before action can be taken. While progress has been made under the current framework, for the most part, that progress has been limited to the pollutants and the specific source sectors targeted in the current Clean Air Act.

How would this vision address issues raised in the NRC report?

The National Research Council report identifies several limitations in the current air quality management (AQM) system that will hinder progress in meeting future challenges. These challenges include:

- Cleaning up air toxics
- Addressing pollutants for which there are no identifiable thresholds
- Meeting new standards for ozone, PM and regional haze
- Protecting Ecosystems
- Responding to the effects of climate change

To respond to these future challenges, the report calls for improvements in the AQM system guided by a set of overarching objectives that emphasize setting priorities based on risk and controlling emissions using an integrated multipollutant and airshed-based approach.

The report recommends several actions to enhance the AQM system, acknowledging that the changes needed to transform the system to meet future challenges may require new legislation from Congress. While other sections of this report focus on refinements to the current AQM system mostly within the framework of the current Clean Air Act, this section presents changes to the current Air Quality Management system that would require revisions to the Clean Air Act. The long-term goal of a transformed AQM is to establish a framework that will more efficiently meet the challenges of the future consistent with the overarching objectives contained in the NRC report.

Implementing the Vision

When we view the air holistically as a valuable, finite resource, we must shift our approach from reactive (i.e., the discover then fix a violation) to proactive, where each increment of pollution in an air shed results in a finite impact, and where each increment of reduction results in an increment of improvement. In this context, the airshed may be a neighborhood, a city, a state, region, country, or transboundary area. From the airshed perspective, less is better -- not just less of one pollutant from a specified list of source sectors, and not just from sources within a given geopolitical boundary.

<Insert programmatic options consistent with the vision here, including the notion of Reasonable Performance Levels, emission fees, etc.; include how a mix of these programmatic options could be pieced together to form an AQM system, perhaps integrated in an AQMP; continuous improvement…>

Whatever mix of programmatic options is chosen to implement this vision, the resulting AQM system would address virtually all of the recommendations contained in the NRC report, including:

1. *Control currently unregulated and underregulated sources:* Emissions of all air pollutants from all sources would be addressed, including those sources that have not historically been subject to regulation.
2. *Expand the use of multipollutant control strategies:*All emissions would be addressed in an integrated assessment of emission reduction options.
3. *Address multistate and international transport:* Transported emissions would be addressed continuously, rather than only in response to a downwind problem.
4. *Develop an integrated program for criteria pollutants and HAPs:* All pollutants would be addressed in an integrated assessment of emission reduction options.
5. *Enhance protection of ecosystems and other aspects of public welfare:* The air pollution burden on ecosystems would be reduced as emissions decline.

++++++++++++++++++
. The Reasonable Performance Level (RPL) approach was evaluated by the subcommittee as one alternative to either transform the existing AQM system, or supplement the system with tools to overcome some important barrier and constraints in the current system. [Some kind of comment on the lack of consensus should be made here, I would think.]

The RPL approach to implementing the new AQM framework

The RPL approach would require all sources of air pollution, over a period of time, to take steps to limit their emissions. Reasonable performance levels (RPLs) would be established and periodically updated for all air pollution sources and all pollutants, beginning with the sources and pollutants that pose the most risk to public health and ecosystems. The RPL approach would establish the minimum conditions a source would need to meet before consent would be provided to emit air pollutants.

In some areas, and for some pollutants, additional steps will be needed to address specific issues. The RPL approach would provide a solid foundation for additional controls that might be needed to address existing or potential area-specific problems. For example, an area may still violate a NAAQS even after RPLs are implemented, and even taking into account lower emissions from upwind areas implementing RPLs. Under these circumstances, attainment SIPs with specific deadlines may still be needed to protect public health.

How would the RPL approach address issues raised in the NRC report?

The RPL approach would address all of the recommendation in the NRC report. In particular:

6. *Control currently unregulated and underregulated sources:* The RPL approach would target all sources, including those that have not historically been subject to regulation.
7. *Expand the use of multipollutant control strategies:* The RPL approach would address all emissions in an integrated assessment of emission reduction options.
8. *Address multistate and international transport:* Transported emissions would be addressed continuously, rather than only in response to a downwind problem.
9. *Develop an integrated program for criteria pollutants and HAPs:* All pollutants would be addressed in an integrated assessment of emission reduction options.
10. *Enhance protection of ecosystems and other aspects of public welfare:* The air pollution burden on ecosystems would be reduced as emissions decline.

How would implementing the RPL concept impact sources?

New Sources: The current approach used to limit emissions from new sources (BACT/LAER) would be extended to all sources. General permits, best management

practices (BMPs), and/or NSPS-like rules would apply to smaller sources and sources for which a specific emission limit could not be established (e.g., area sources).

Existing Sources: Over time, all existing sources would be required, at a minimum, to limit emissions of all pollutants to levels consistent with the application of "cost-efficient" technologies and/or best management practices.

July 17, 2006

LOCAL AIR QUALITY PLANNING
Recommendation #4
AQM Subcommittee Team 1, Group 2

Recommendation:

- Local / Tribal governments should be encouraged to integrate and/or expand 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.

- As America grows, it is particularly important that land use/transportation/air quality linkages be established in a manner that educates, provides incentives and flexibility for local/tribal officials and governing boards or commissions because local forums have great power to design and manage growth in ways to stimulate creative cost effective solutions for preserving clean air.

Background/Explanation: If we as a nation are to preserve the clean air still enjoyed in much of the country, we must begin to manage the chronic air pollution growth from minor and mobile sources that is occurring in high population growth areas where green fields are rapidly giving way to new residential, commercial and transportation developments.

A largely missing element of the clean air framework is the tools to achieve the policy goal of Section 160(3) of the Act "to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources" when minor and area source growth emissions are a threat to retaining clean air.

During the long history of the Clean Air Act, local government planning generally has only occurred when a non-attainment problem must be solved. Local governments, elected officials, and the business community, however, can react quickly to bring about cost-effective solutions to air quality problems when they understand the possible adverse economic impacts as a result of inaction. Opportunities for flexibility and inventiveness should be encouraged to engage local leaders early in the air quality management process in order to avoid prescriptive programs that would accompany non-attainment. Recently in North Carolina for example, local officials and the business community began to take significant ownership of the air quality issue and worked closely with EPA and the state to develop a suite of control measures with the specific goal of solving their air quality problem and hopefully deferring a nonattainment designation for their area.

Preserving clean air is no longer just a big industry and auto tailpipe challenge. Local governments and local leaders have a growing appreciation of the value of clean air as a health, quality of life and economic resource. Chronic erosion of air quality which gradually builds to violations of the health standards is an outcome Congress foresaw in 1977. While PSD increment standards and baseline dates set the foundation, neither the Act nor its rules were designed to tackle the challenge of massive urban expansion on green fields where today's clean

rural air quality is chronically eroded by small point sources, area and mobile air pollution sources in a relatively ungoverned manner.

The Issue Paper on Local Planning discusses other options including comprehensive state-wide or region-wide airshed planning that could tier-up from a mosaic of local plans. However, if all areas are required to undertake local planning, it could become a significant and unnecessary burden for local and tribal governments. Consequently, a more surgical approach is recommended to be applied in high population growth areas. This planning requirement would need to be accompanied by new planning tools to aid local and tribal governments.

Problems/Challenges Addressed: A new local planning paradigm is needed if states, local governments and reservations are going to preserve clean air below the NAAQS level while also promoting population growth and the vitality of their economies.

The PSD goals of Congress envisioned managing chronic pollution growth in clean air areas (CAA Section 160). However, the PSD rules are not designed to meet the challenge of chronic pollution growth from numerous minor and mobile sources when large green field areas are urbanized rapidly. Left unfettered, chronic pollution growth can consume the PSD increment and then become an impediment to new economic opportunities.

NAS Recommendation Addressed: This proposal addresses Recommendation # 2 by expanding the national AQM system to integrate and require local / tribal planning in some situations where pollution growth is occurring but not violating NAAQS.

In so far as ecosystem protection (Recommendation #5) is enhanced when air quality conditions are controlled to less than NAAQS levels, this proposal advances the AQM system for ecosystem protection and public welfare.

Scenario: #2 – Clean Air Act Sections 160 and 161 can serve as the basis to support new regulations that would achieve the concepts presented here for local planning.

Recommended Actions: Other than as mentioned in the following section, recommended actions have not yet been developed.

Implementation: Implementing this proposal will require considerable work especially with the local governments that are most likely to be affected. Regulations will be necessary and tools and guidelines for local government are essential. States will likely have a role in assisting locals or deciding when high growth areas will become subject to the local planning requirement. Because rapidly growing areas are often broader than one city or one local government, states will likely have an essential role in deciding when aggregate communities need to develop a multi-jurisdictional forum to accomplish the planning function.

Local AQM planning could integrate well with other recommendations of the Subcommittee notably: *Overcoming Barriers to Clean Energy / Air Quality Integration*; *Reasonable Performance Levels;* and possibly *Boundaries*

Success in implementing this concept for a new AQM planning paradigm is believed to rely on incorporating some key attributes while specifically avoiding others.

Attributes to Embrace:

- Leverage off of existing local or tribal government functions;
- Promote and create incentives for embracing clean air as a community economic, health and quality of life resource that is conserved and managed locally;
- Promote creative incentives shown to build local stakeholder buy-in;
- Recognize that a new "drivers" are necessary to force the AQ goals, yet drivers could be crafted as backstop provisions leaving room for results based innovations and stakeholder buy-in;
- Rely more on accountable changes via emission inventories, less on ambient monitoring, and less on modeling projections. For example, perhaps use the rate of change in emissions per 10 square miles or other emissions density changes as a surrogate for ambient AQ degradation and the trigger for local planning.

Attributes to Avoid:

- Avoid the current bureaucracy burden of non-attainment area SIPS.
- If the rules use the concept of SIP credits as a necessary measure of emission reductions, then create easier paths for credits when using innovative cutting edge strategies - rely more on post-planning field verification of benefits achieved.

Benefits: Fills a gap in the existing air quality management system to manage chronic pollution increases in high population growth areas of the country in order to preserve existing clean air areas. The recent history has shown this can be achieved in a way to stimulate local/tribal leaders' wise use of air resources promoting health, quality of life and the economic vitalities of our cities and communities.

This proposal benefits ecosystem protection and creates stronger opportunities for tribal government air quality management which could assist environmental justice goals.

Sectors/Categories Recommendation Applies to: The proposal provides new oversight to minor source and area source pollution management, enhances mobile source management in high population growth areas.

Tools Needed: Yes – many are needed. Considerable effort is required to develop a comprehensive listing. Other stakeholders beyond the Subcommittee should be engaged.

Priority: High

June 19, 2006
Recommendation #5
BOUNDARIES
AQM Subcommittee Team 1, Group 2

Recommendation

The AQM subgroup recommends the use of "regional airsheds" to approximate the boundaries of emission source areas most likely to contribute to nonattainment areas. Such areas would form a rough approximation of the Area of Influence (AOI) concept recommended by the FACA. Areas of violation (AOV), also recommended by FACA, can be applied simply as the areas not meeting ambient air standards (i.e., existing nonattainment areas) with the main goals of targeted outreach for protection of health and emission control requirements designed to keep the local and downwind air quality from getting worse. The subgroup further recommends that regional multistate organizations be used as the coordinating vehicle for management of the Airshed Planning Regions.

It is recognized that many air pollution problems are highly localized and/or isolated in nature and do not need extensive regional coordination. Provided that the jurisdictions involved in such situations can agree that "local" treatment is appropriate, there is no reason to require that the areas be included within a regional airshed.

Background/Explanation

The Clean Air Act is generally geared toward addressing air pollution at the local level, focusing mostly on acute impacts from specific pollution sources. While successful for air pollutants with limited transport range, other pollutants such as ozone and small particles have been much more resistant to the "local problem – local control" concept.

Some provisions under the current Clean Air Act that allow EPA to issue rulemaking to address pollution on regional and national scales, typically focusing on specific pollution sources (MACT, heavy-duty diesel, Tier 2, etc.), but sometimes also more general (NOx SIP call, CAIR, etc.). EPA's stated goal is to reduce pollution from these sources enough that states and tribes can meet attainment by enacting a reasonable amount of local controls.

In order to target widespread ozone nonattainment spanning several states, the Clean Air Act specified that the Ozone Transport Commission be created, consisting of 13 states and the District of Columbia in the Northeast in order to create a formal forum for interstate planning purposes. Generally speaking, this exercise has been a success and regional ozone levels have dropped significantly. Outside the Northeast, most states have worked independently to develop their SIPs or have banded together on a piecemeal basis to address emissions. Today, there are still many areas still suffering regional ozone nonattainment.

As ambient air pollution standards become more protective, localized pollution controls have become more difficult to identify and more costly to implement. The OTAG process demonstrated that certain pollutants such as ozone defy state boundaries and that some states

could not reach attainment without more regionally and nationally coordinated emission reductions. Thus the need for regional coordination has increased greatly for pollutants with longer atmospheric lifetimes (ozone, small particles, etc.) Section 126 petitions have been filed by states desperate to reduce upwind emissions.

There was a strong feeling from the subgroup that the most scientifically correct boundary recommendations stem from the area of influence (AOI) / area of violation (AOV) concept originally proposed by FACA. It is an approach that is designed to succeed efficiently and cost effectively. Unfortunately, the AOI/AOV concept has never been seriously considered for full implementation because of the complexity in defining the area of influence. Area of influence is a complicated concept in which boundaries can change under differing weather patterns.

Challenges Addressed

1. Determine meaningful boundaries
2. Transform the SIP process
3. Deal with pollution transport

NAS Recommendations Addressed

Scenario

2/3 – Partial implementation through a stretch of the current CAA, but full benefit may require revisions to the CAA.

Recommendation Actions

The regional airshed concept is based on the scientific principle that topography, weather patterns, and pollution sources combine to create their own boundaries and that it is this boundary that needs to be managed in order to most effectively meet clean air goals. An example of airshed management is the Ozone Transport Region in the Northeast. Several states with a common problem, high ozone levels, were grouped together so that they can combine resources to meet a common goal. Combined, the states are charged with identifying air pollution reduction measures that can be implemented regionally, and thus lowering implementation costs and economic competitiveness between partner states. The concept has been an unprecedented success although when created it was not anticipated how great the inter-airshed transport would be. For regional airsheds to be effective, lessons should be learned from what works and what does not with the Ozone Transport Region. Scientifically correct airshed also need to be defined in other regions of the country so that those regions can benefit from the expanded coordination.

It is recognized that not all air pollutants and nonattainment areas are in need of regional treatment. Assuming the jurisdictions involved within the region agree to treat the situation "locally", there is no reason to require additional regional airshed planning.

Regional Planning Organizations developed for regional haze planning were an attempt to develop a form of airshed management, but during the formation, certain states did not want

to get clustered with certain other states and the end result of the RPO boundaries became an airshed/political boundary hybrid. In order to work, the airshed boundaries need to be developed based on the science, starting with regions demonstrating measured air pollution commonalities as well as common source types. Rather than creating a new set of planning organizations, the multistate organizations could serve to bring the airsheds together with the requirements of seeking common solutions. Airsheds would seek to cover multiple pollutants whenever possible, but airsheds may ultimately need modifications to accommodate other pollutants.

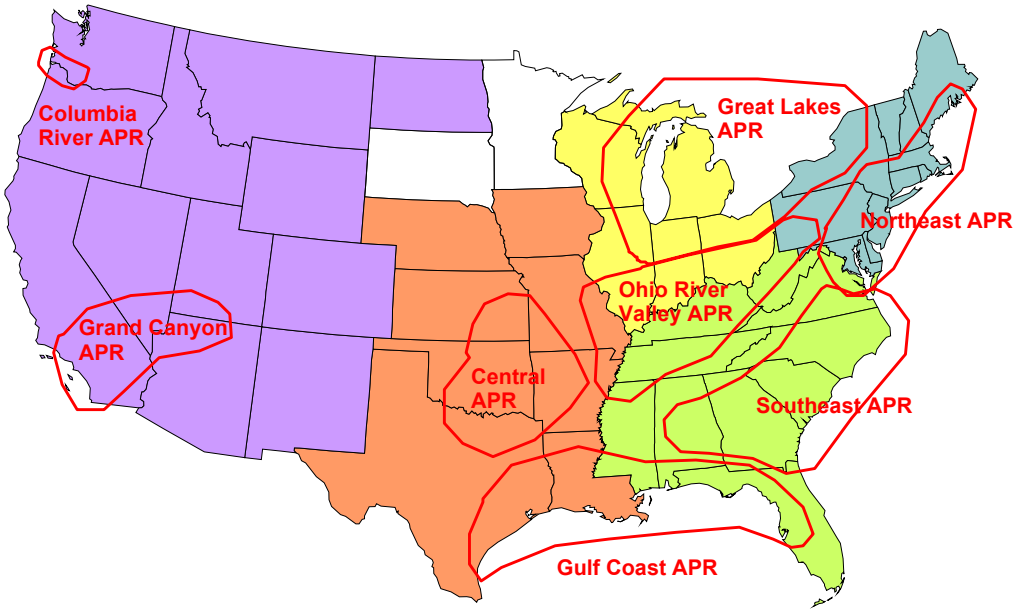
Key Points

- Nonattainment areas will still represent areas with poor air quality and be the focus of state/tribal SIPs
- Airshed Planning Regions look at the regional context of air pollution sources and how it affects nonattainment areas and other areas of poor air quality. Efforts should be focused on building successful state/tribe interrelations and SIPs.
- Multistate organizations (MSOs) will provide the forum for bringing the regional states together for coordination and planning.
- National - EPA will still need to seek out pollution controls that are best implemented on a national or sub-national level and will provide resources as needed to study air pollution emissions, transport, and the coordination of the MSOs so that transport and airsheds that span across broad regions are properly considered.

Considerations for Defining Airshed Planning Regions (APR)

- Resist use of political boundaries when defining airsheds.
- Monitoring and major sources/source regions should be considered.
- Regional modeling and meteorological modeling should also be considered.
- Nonstandard forms of measurements such as aircraft, balloon, satellite, mountain-top, building/tower monitors could prove useful.
- While MSAs may be useful in identifying the urban extent of metropolitan emissions, the boundary is generally too small to be considered an airshed.
- Once an airshed is defined, efforts should be made to understand the science of what creates it, special topographical and meteorological issues, population health risk, and other environmental and socioeconomic impacts.
- Airshed Planning Regions could contain several nonattainment areas.
- Airshed Planning Regions would not necessarily include entire states, nor would they necessarily be entirely contained within the existing RPOs.
- The existing RPOs may contain multiple Airshed Planning Regions
- States may opt into upwind and downwind airsheds.

Example of what regional Airsheds may look like:



Implementation

Implementation of Airshed based boundaries will be scientifically intense up-front, but once implemented, maintenance of it should provide cost savings to the system as a whole with more cost effective air pollution control strategies more than making-up for increased costs of regional coordination.

In order to for the airshed concept to work most efficiently, the airshed boundaries need to be developed based on the science, starting with regions demonstrating measured air pollution commonalities as well as common source types. Rather than creating a new set of planning organizations, the existing RPO structure could serve to bring the airsheds together with the requirements of seeking common solutions. Airsheds would seek to cover multiple pollutants whenever possible, but airsheds may ultimately need modifications to accommodate other pollutants.

In defining regional airsheds, every attempt should be made to clearly define the airsheds as simple, but scientifically sound regions, down to the county level. Politically convenient boundaries should only be used as a tie-breaker where scientific data doesn't show a preference. It should be further noted that local, regional, super-regional, and national pollution controls may still be most practical on a case-by-case basis and thus should be considered during the air quality planning process.

Benefits

Improves and better coordinates interstate planning and rulemaking to more accurately reflect the science of air pollution formation and transport. Ultimately there will be overall cost savings through implementing emission controls in areas where they are most likely to

be effective. The airshed system should also prove more successful in achieving and maintaining attainment of the most persistent air pollutants.

Sectors/Categories Recommendation Applies to

While some categories could be singled-out for initial implementation, all categories should ultimately be included under this recommendation.

Tools Needed
TBD

Priority
High - Forms basis for many other Subcommittee recommendations

Re-Drafted Based on Comments from Atlanta Meeting

CONTINUOUS IMPROVEMENT
Recommendation #3
AQM Subcommittee Team 1, Group 2
July 19, 2006

Recommendation

The AQM subcommittee recommends that a combination of options be considered and implemented to achieve continuous emission improvements across multiple source sectors, including mobile. Recommendations include voluntary and incentive based programs at the local, state and national level. They also 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. There should be an emphasis placed on demand side or end use efficiencies, mobile and the more non-traditional emission sources. This recommendation is not intended to mandate emissions reductions just for the sake of reductions without regard to the economic consequences. It is intended to induce desirable emissions reductions through the use of the economics and the market place wherever possible.

Based on historical successes with market-based systems and the general preference of businesses and individuals to control their own decisions, the subgroup feels it's important to include where appropriate *market-based incentive programs* based on potential for continuous improvement. Such programs include:

1. Public emissions reporting – similar to the Toxic Release Inventory (TRI) program to apply public pressure for "cleaner" products,
2. Emission fees (with revenues used to pay for other environmental initiatives),
3. Emission fee system based on an industry average performance.

While the focus of this recommendation would generally be more on the above market-based systems, there may be advantages to greater use of cap and trade approaches where SIP strategies require specific source sector emissions reductions. They might include:

4. Traditional emissions cap and trade – especially for high growth industries,
5. Emissions cap and trade with a continuously declining cap or allowance retirement,

Background/Explanation

There are two forms of continuous improvement considered by this paper. The first form, Type 1 focuses on maintaining existing air quality through growth in demand. Type 1 focuses on improving operational efficiencies to be able to generate more electricity, produce more products, provide more services, and accommodate more vehicles on the road without increasing air pollution emissions. The second form of continuous improvement, Type 2, focuses on health and environmental improvements that would be achieved by gradually

reducing ambient air pollution levels over time to lower levels than currently foreseen under the current National Ambient Air Quality Standards.

Type 1 systematic continuous improvements are needed to prevent economic and business growth from being stymied. This type of focus on continuous improvement focuses on maintaining current air quality levels while making room for additional economic growth. Type 1 continuous improvement is not a new concept. It exists as a component of many state/tribal implementation plans (SIPs/TIPs) (e.g., reasonable further progress requirements), conformity regulations, cap-and-trade programs (e.g., where industries need to accommodate increased production under a fixed cap), and in offset ratios set for certain nonattainment areas. Type 1 continuous improvement is critically needed in order to ensure a vibrant economy with room to grow. While market based programs have helped address improvements for large point sources, the improvements in certain area and mobile source sectors have been more difficult to achieve. While conformity regulations have acted limit emission growth in the area and mobile source sectors, they have also restricted economic growth in some geographic areas. Conformity is a planning process that can produce meaningful results, but can also result in an odd predicament where a local government is forced to allow citizens to buy more polluting products, but then tell them they cannot use them or can only use them in a limited way.

The need for Type 2 continuous improvements stem from recent epidemiological studies that find health benefits for certain pollutants, including ozone and PM2.5, continue to accumulate at a steady rate as pollution levels decrease. Factoring-in savings to health care and other business related costs, additional pollution controls continue to be very cost effective and beneficial to the economy as a whole. Therefore, there is a benefit to establishing a program that encourages continuous improvement with respect to emission rates and ambient air pollution concentrations. Type 2 continuous improvement is also not a new concept and is reflected in the regional haze program. This program seeks to reach natural visibility conditions by 2065, a goal that heavily relies on continuous emissions improvement. Technology development must be encouraged to push towards continually lower emissions and more efficient operations as time progresses.

The Clean Air Act (CAA), as it is currently written and implemented, relies heavily on technology-based emission standards for reducing air pollutants to meet air quality goals. Technology based emission standards have many positive attributes and can be credited with most of the air quality achievements under the CAA to date. While some emissions sectors would benefit from continued command and control, other sectors may benefit from more progressive programs that create a self-driving market-based incentive toward continuous improvements. Market based programs have a proven success track record through the acid rain program and thus additional market based programs should be considered for other source sectors. Voluntary emission reduction programs could also prove beneficial and could be best put to use to encourage emission reductions beyond required levels. If considered as part of a plan to meet required reductions, they should be encouraged prior to a date certain and contain a regulatory backup that would be triggered if the voluntary program fails to meet targeted emission reductions.

Challenges Addressed

- Provide mechanism(s) for achieving continuous emission reductions from stationary, mobile and area sources
- Ensure continuous air quality improvement in all geographic regions
- Provide incentives for on-going development and diffusion of new control technologies and pollution prevention techniques
- Create a flexible system that can accommodate changes in science and air quality planning needs

NAS Recommendations Addressed

- Controlling currently unregulated and under-regulated sources; expanding use of performance-oriented, market-based (where appropriate) multi-pollutant control strategies.
- Transform the SIP process into a more dynamic and collaborative performance-oriented, multi-pollutant air quality management plan (AQMP).
- Enhance protection of ecosystems and other aspects of public welfare.

Scenario

1-3 depending on option

Recommendation Actions

Options Reviewed:

A. Technology-based emissions standards (Type 1 of continuous improvement),
B. Emission standard glide-slopes (Types 1 and 2),
C. Cap and trade programs (Type 1),
D. Cap and trade programs with continuously declining caps (Types 1 and 2),
E. Ambient air quality standard glide-slopes (Types 1 and 2),
F. Voluntary improvement programs (type unknown),
G. Emission fee systems (Types 1 and 2),
H. Emission fee system based on industry average performance (Types 1 and 2),
I. State/tribe regulatory improvement systems (Types 1 and 2),
J. Emissions reporting – Similar to TRI (type unknown),
K. Reasonable Performance Levels (RPL) (Types 1 and 2).

Each of these options could be fine-tuned and applied to a wide variety of source categories, although each application may present its own unique issues and implementation challenges. ***There may be a number of additional viable options for promoting continuous improvement with respect to air pollution emissions and ambient concentrations.***

It is likely that a combination of options will ultimately provide the best approach. For example, state/tribal improvement systems could be combined effectively with most of the other options listed in this paper. Some approaches may work well for certain source categories and not for others. In any event, it is the opinion of this subgroup that federal guidance and/or technical support (with substantial state/tribe and stakeholder input) would

be needed to further develop and successfully employ those options which have not been previously implemented on a significant scale.

Based on prior experience, the market-based options are particularly attractive because they provide a *continuous market-based incentive* to reduce emissions. Moreover, rather than relying on regulators to determine the best targets for further reductions, these options would harness the ingenuity of thousands of industry scientists, process engineers, marketing experts, environmental specialists, and others with intimate knowledge of each and every facility, operation and product.

Implementation

Option C: Under **emissions cap-and-allocation trading systems**, regulators establish an emissions target (a "cap") for a group of sources and a schedule for achieving that target for a specific area and control period based on modeling and air quality goals. Tons of emissions representing individual "shares" of the cap are then allowed or "allocated" to each source. The source documents its actual emissions over the control period and compares this to its "balance" of available allocations. Compliance is demonstrated by showing actual emissions less than or equal to allocations.

Emission cap and trading programs can create a continuous incentive to reduce emissions. The ability to sell unused allowances, or save them for later use, gives all participating companies a powerful ongoing financial incentive to pursue cost-effective emission reduction opportunities. In addition, companies in growing industries have to continuously reduce their emissions (per unit of production) in order to meet increased demand for their goods and services without exceeding the cap.

A constant emissions cap provides for continuous improvement within the capped sector whereby increasing product growth must be accommodated (Type 1). Under some cap and trade programs, allowances can be retired at a certain rate in order to also provide for continuous environmental improvement (Type 2).

Option D: **Emission cap and trading programs with a declining cap** create a continuous incentive to reduce emissions. Sources subject to these programs must demonstrate at the end of each reporting period that they hold a sufficient number of emission allowances to cover their actual emissions. The ability to sell unused allowances, or save them for later use, gives all participating companies a powerful ongoing financial incentive to pursue cost-effective opportunities for lowering their emissions. Beyond this, affected sources, collectively, must anticipate and implement the measures needed to remain in compliance after each incremental reduction in the cap.

A program for establishing a steady rate of declining caps could be established through the retirement of trading allowances at a certain rate per year. The rate of

retirement, thus the rate of the declining cap, could be adjusted to capitalize on major technological breakthroughs.

Option G: **Emission fees** create a continuous incentive to reduce emissions in order to lower total fee payments over time. They spur emission reductions from all sources and/or activities covered by the fee and encourage continuous improvement. Even where the fee charged per unit of pollution is relatively modest, fee programs can result in the collection of large sums of money. These funds can be (a) turned over to the federal or states Treasury, (b) used to finance other initiatives designed to improve air quality, such as diesel retrofit programs, or (c) returned in some manner to manufacturers or consumers.

Option H: **Emission fees based on industry average performance or Industry Average Emission Fees (IAEF)** (such as Industry Average Performance System -IAPS) is a competitive, market-based system that is self-governing for air pollution control. Sources in a given industry are charged a fee each based on the degree that their emissions exceed their industry average. The fees can then be applied in a variety of ways, including being applied to fund other air pollution control initiatives. Dirtier than average sources have the incentive to reduce payments by updating pollution controls or operational efficiencies based on economic factors pertinent to them. This creates a continuous incentive for sources to reduce emissions. The fee may be automatically increased if the targeted level is not achieved.

Sources choose where, when, how much and through what means to reduce emissions. Regulatory agencies focus on reviewing emission reports and receiving and disbursing funds. In the absence of traditional "boom or bust" regulatory cycles, capital for control technology innovation is less risky, development is enhanced, and more new controls become cost-effective sooner. Over time, each source that reduces emissions causes the overall average to drop, creating a self-perpetuating continuous improvement dynamic.

IAPS is a hybrid approach where sources in a given industry are charged a fee each year based on their emissions. The "pot" is refunded to the same sources, but based on output. As a result, cleaner-than-average sources become net payees and dirtier-than-average sources become net payers. This creates a continuous incentive for sources to reduce emissions. Each year sources choose the cheaper option: further reducing their emissions (and paying less into the "pot"), or paying the per-ton fee for each ton they are currently emitting. A variation of this program could involve applying some percentage of the collective “pot” into funding other continuous improvement programs.

Option I: **State and Tribal Programs** could be developed to meet their own continuous improvement needs based on their own interests and priorities. This could be done on a completely voluntary basis (i.e., not much different from what exists today), or under basic parameters set by federal regulations. Many of the other options discussed in this paper could also be considered as state/tribe programs. States

and tribes may be in the best position to develop targeted programs for continuous improvement.

Option J: **Emissions Reporting** systems could be developed similar to the Toxic Reporting Inventory system where the public has access to the emission information related to marketed products. Provided the results of the emissions reporting are easily assessable, the public would be empowered to support or not support certain products. It is envisioned that reporting could be provided on product labels and on an accessible Internet site.

Benefits

Over time, manufacturing, energy generation, and the emissions of public commerce would become more efficient and cost effective on a per unit basis while maintaining or improving environmental and/or human health implications. Ideally, a combination of continuous improvement approaches will reach each source sector and provide options to improve operations at a reasonable cost. Certain market-based programs can provide enough pressure for continuous improvement, but not so much as to exceed the existing state of technology.

Sectors/Categories Recommendation Applies to:

While some categories can be easily singled-out for initial implementation, all categories should ultimately be included under at least one form of continuous improvement program. Some emission source types may lack enough of a clear-cut industry to reasonably apply a market-based program. Such emission source-types may still require traditional command and control programs in order to achieve continuous improvement as needed.

Tools Needed

[Place holder for Team 2 insert]

Many of the options identified for continuous improvement require some type of emissions measurements/estimations in order to gauge progress. The methodology for performing this task should be reviewed and improved in areas where acceptable techniques have not yet been established. Automation of emissions estimates derived from emission factors could be considered provided there is a reasonable level of confidence in the factors and usage data involved.

Priority

Medium to High – Largely driven by need to establish long-term planning and set regulatory certainty.

Episodic Control Measures
Recommendation #6
Team 1, Group 2
July 26, 2006

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

Background/Explanation

The U.S. air quality management system has long relied on the use of continuous, year-round control measures. Beginning in the 1980s, EPA and a number of states have also implemented measures to reduce emissions on a seasonal basis, including regulatory programs to lower the vapor pressure of gasoline, to require the use of reformulated gasoline and oxygenated fuels, and to reduce NOx emissions from electric power plants during pre-determined periods of the year. Continuous and seasonal control measures offer numerous advantages over the use of shorter-term "episodic" control measures. Nevertheless, despite their advantages, some areas of the country will be unable to expeditiously attain and maintain the 8-hour ozone standard, or the proposed new daily standard for PM2.5, through the use of continuous and seasonal control measures alone.

A number of communities have supplemented the use of continuous and seasonal control measures with public information campaigns and voluntary programs designed to reduce emissions on specific days when high ozone concentrations are expected. Some of these communities have implemented broad-based ozone action programs that encourage an array of voluntary measures by individuals and businesses to reduce emissions. Other communities have explored or adopted specific mandatory measures to reduce emissions, including restrictions on recreational vehicles, lawn and garden equipment, pesticide application, road paving, traffic marking, construction activities and the operation of waste incinerators. Some communities have also developed programs to reduce particulate emissions, e.g., through restrictions on open burning and curtailment of residential wood combustion, on days when high PM concentrations are expected. However, despite the growing interest in peak day emission reduction programs, the U.S. air quality management system continues to be characterized by an overwhelming reliance on continuous and seasonal control measures.

Efforts to expand peak day emission reduction programs could benefit from increased research and technical assistance to communities regarding successful program design, implementation and program evaluation. However, the greatest opportunities for expanding these programs may come from the elimination of legal restrictions concerning the use of "intermittent" controls.

In 1977 Congress considered and explicitly rejected the use of intermittent controls as part of a SIP for achieving the NAAQS. This prohibition was aimed at avoiding reliance on temporary controls where more reliable continuous controls were presumed to be readily available. It was also intended to prevent the shifting of pollutants (e.g., by utilities with widely dispersed production capacity) from one place or time to another, without a corresponding decrease in

overall pollution levels. Given the extent to which continuous controls have been deployed over the past 30 years, and the considerable strides that have been made in air quality modeling and forecasting, the concerns expressed by Congress in 1977 may no longer be germane.

EPA has concluded that the Clean Air Act does not restrict SIP approval (or credit) for episodic reduction measures that apply to consumer products or services, or to certain (i.e., non-stationary) consumer actions, since these measures may represent the only feasible type of control. EPA has also concluded that episodic transportation control measures and certain other mobile source measures may be approved for SIP credit under certain circumstances. However, EPA maintains that the Clean Air Act limits the use of intermittent controls at *stationary sources* as part of an approvable SIP.

Legal issues notwithstanding, episodic control measures at stationary sources could provide a new set of cost-effective control opportunities capable of yielding large emission reductions precisely where and when they are most needed. For example, electric power producers and certain industrial sources may have latitude to burn cleaner fuels or to increase the utilization of cleaner units on high pollution days. Even on the hottest days, power plants may operate well below capacity at night and during the early morning hours, which may allow dispatchers to shift more production to their cleanest units at those times. In addition, power producers may be able to achieve reductions by importing electricity at key times from cleaner sources outside of the region. In addition, some large and small scale manufacturing operations may have the ability to alter their production schedules and/or operations to reduce emissions on predicted high pollution days.

Problems/Challenges Addressed

- Ozone nonattainment is an episodic problem in many areas of the country, where the risk of exceeding the 8-hour standard is confined to a limited number of days during the warm weather months, when precursor emissions and meteorological conditions can combine to form peak ozone concentrations.
- Under EPA's proposed new daily standard for fine particles, nonattainment is also likely to be an episodic problem for many communities, although depending on the area, peak PM2.5 concentrations may occur in different seasons throughout the year.
- Despite the episodic nature of ozone and PM2.5 air quality problems in many areas, the air quality management system in the U.S. has been dominated by the use of continuous and seasonal control strategies.
- Some areas are unable to expeditiously attain and maintain the short-term standards for ozone and PM2.5 through the exclusive use of continuous and seasonal control measures and, as a result, their populations will encounter periods of exposure to unhealthy ozone and/or fine particle concentrations for years to come.

NAS Recommendation Addressed

- Meeting the NAAQS for ozone and PM2.5 and reducing regional haze
- Ensuring environmental justice

Scenario: Noted after each recommendation.

Recommended Actions

- Expand federal research and technical assistance to communities regarding the design, implementation and evaluation of successful programs to reduce peak day emissions from non-stationary sources (scenario 1).
- Expand the use of stationary source episodic control measures as a backup insurance mechanism (i.e., outside the scope of an approved SIP) for areas struggling to maintain the short-term ambient standards (scenario 2).

Note: there is not consensus on the following recommended action:

- Evaluate the pros and cons of amending the CAA to remove any legal uncertainty regarding EPA's authority to grant SIP credit for intermittent control measures at stationary sources in areas where all reasonable continuous and seasonal control measures have already been required (scenario 3).

Implementation: If the use of episodic control measures is to be expanded – and more fully extended to stationary sources – a number of implementation issues must be addressed, including:

- What role should these measures play in the air quality management system? Should they be mandatory or voluntary in nature? Interim or permanent? When should they be given credit in an air quality management plan?
- How can the results of such programs be measured?
- Since any measure that can interrupt or alter manufacturing operations may have significant and complex business impacts, how should these impacts be assessed and appropriately reflected in the design of a mandatory program?
- How far can EPA and states go in developing episodic control measures for stationary sources under existing legal authorities?
- How well can high pollution days be predicted and how best can episodic measures be called into effect?
- What stationary source control measures might be suitable candidates for episodic implementation?

Benefits

- Episodic control measures can provide an expanded set of cost-effective control opportunities for states and local communities. These measures are capable of yielding sizable emission reductions when they are most needed.
- A variety of measures which could not be implemented on a continuous or seasonal basis could prove suitable and acceptable for episodic use.
- For areas that are struggling to *attain* ambient air quality standards, despite the imposition of all feasible continuous and seasonal controls, the use of episodic control measures can accelerate air quality progress, and provide the "final stroke" needed to achieve attainment, without undermining the role of continuous or seasonal controls.

- For areas that are struggling to *maintain* ambient air quality standards, episodic control measures can serve as a backup insurance mechanism by preventing air quality violations on days when meteorological conditions might otherwise stress a local air quality management plan beyond its breaking point.
- By reducing peak concentrations on the highest pollution days, episodic control measures can provide considerable health and environmental benefits to all effected populations.

Sectors/Categories Recommendation Applies to: All

Tools Needed

- Additional research and technical assistance on the successful design, implementation and evaluation of voluntary programs designed to achieve peak day emission reductions.
- Sector-specific engineering and cost data to assess (and quantify) the potential contribution of stationary source episodic control measures.
- State-of-the-art methods for predicting potential ozone and PM.2.5 exceedance days.

Priority: [TBD]

July 18, 2006

DRAFT
Recommendation #2
Comprehensive Air Quality Management Planning
AQM Subcommittee, Team 1, Group 2

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 AQMP would be a statewide plan that would be updated on a fixed schedule (e.g., 7 years). The AQMP would address air pollutants in an integrated manner, including attainment and maintenance of the NAAQS, sector-based reductions of HAPs and criteria pollutants, visibility and ecosystem protection, and local environmental issues within a State. For a true multi-pollutant approach, all issues that relate to air quality (e.g., energy policy, climate change, transportation, and land use) would need to be addressed in the AQMP. The goal would be to create a comprehensive plan that is multi-pollutant-based and which addresses all of the critical air pollution issues within a State, sets priorities, and provides an overall plan. The AQMP could then form the basis for creating multi-state/regional AQMPs in the future.

This recommendation could be implemented in two phases. In both Phases, the AQMP would act as an umbrella document for a State's plans to address air pollutants. Under Phase 1, N no CAA amendments would be needed for implementation of the recommendation. Thus, the AQMP would not be a statutory mandate; however, it could be encouraged by EPA guidance, within EPA regulations, and through the provision of incentives. For Phase 1, the timing associated with SIP submittal requirements following a new or revised NAAQS would still need to be met in addition to the schedule associated with an AQMP submittal or update. The work group believes that the full attributes of an AQMP can be realized under a Phase 1 scenario. Should it be found to be desirable to better synchronize the submittal dates of SIPs required after a new or revised NAAQS, the concept of a Phase 2 scenario could be employed. In Phase 2 current CAA requirements for a State to submit an enforceable "SIP" to deal with attainment and maintenance of the NAAQS would remain the same; CAA amendments would be needed to make the AQMP a requirement and to synchronize submittal dates of SIP elements with the State's AQMP. However, it should be emphasized that, with a Phase 1 approach, the benefits of a statewide and comprehensive integrated plan for addressing all critical air pollution issues within a State can be realized. Under a Phase 1 approach, guidelines would need to be established for updating the AQMP to comply with CAA requirements regarding NAAQS revisions.

Background/Explanation:

The CAA currently takes a single pollutant approach for criteria pollutants (through the NAAQS) and a source sector-based approach to HAPs (through the NESHAPs). This approach can result in the selection of control strategies/technologies that cause disbenefits (i.e., increases in emissions of other pollutants). Though the current CAA has requirements that make a multi-pollutant planning approach difficult (e.g., varying attainment dates), a multi-pollutant approach to air quality management 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.

Problems/Challenges Addressed:

There are two fundamental problems with the existing system. First, the process of multiple SIPs being developed on different schedules but in the same general timeframe creates very difficult management and resource problems for States and Tribes. With a consolidated and comprehensive AQMP that addresses all air quality related issues and which is developed for the whole state on one fixed schedule, there would be significant economies of scale for resources, and this would result in a more thorough plan. In addition, State, local, and Tribal agencies continue to struggle to meet national ambient air quality standards, and these standards continue to be tightened. National, regional, and local emission controls have been required on many sources of pollution but local impacts still occur from nearby sources, and regional impacts are also felt as pollutants are transported long distances.

This recommendation suggests ways to accomplish the goal of reducing emissions of air pollutants more effectively and efficiently, in order to protect human health and ecosystems.

NAS Recommendations Addressed:

This recommendation addresses NAS recommendations 3, 4, and 5, and is more specific than NAS recommendations 3 and 4.

> Recommendation 3: Transform the SIP process into a more dynamic and collaborative performance-oriented, multi-pollutant air quality management plan (AQMP) process.
>
> Recommendation 4: Develop an integrated program for criteria pollutants and hazardous air pollutants.
>
> Recommendation 5: Enhance protection of ecosystems and other aspects of public welfare.

Recommended Actions for Phase 1:

- Develop a framework for an AQMP
- Investigate the extent to which rules or guidelines could be issued to require/promote an AQMP
- Transition to a comprehensive multi-pollutant air quality management planning approach
- Develop a case example of a multi-pollutant AQMP by working with a State (e.g., CA) with experience with multi-pollutant AQM planning
- Continue current efforts to support multi-pollutant control strategy development (e.g., Detroit Pilot Project, development of guidance, development of tools and data (per Team 1, Group 1 recommendations))
- Use findings of AQM Phase I assessments (e.g., assessments of identified sectors) to help target emission reduction efforts
- Determine approaches for attaining targeted emission reductions expeditiously and with greatest overall benefits

Recommended Actions if Phase 2 is Pursued in the Future:

- Assure that current CAA requirements regarding SIPs are preserved
- Synchronize SIP submittal dates with regular AQMP updates or provide for supplemental AQMP updates to assure "SIP" revisions are timely

Implementation:

Many of the recommended actions for Phase 1 could be implemented readily; some would require additional resources. Many of those associated with Phase 2 would require additional resources, as well as legislative changes to the CAA.

This recommendation provides a framework for the integration of many other recommendations.

Benefits:

This recommendation for a periodic AQMP will improve air quality management by creating an approach for addressing air pollutants in an integrated manner, including attainment of the NAAQS, sector-based reductions of HAPs and criteria pollutants, visibility protection, ecosystem protection, and local environmental issues within a State. Issues that relate to air quality, including energy, climate change, transportation and land use could also be included in the AQMP. There could be a significant improvement in the effectiveness of a State or Tribal air quality program.

Sectors/Categories Recommendation Applies to:

This recommendation could apply to all mobile, stationary, and area sources and all sectors/categories.

Tools Needed:

Improved monitoring and modeling data and tools would assist the implementation of this recommendation (per Team 1, Group 1 recommendations).

Priority: High

Technical Supplement to Recommendation #2
Comprehensive Air Quality Management Planning

Background

This recommendation could be implemented in two phases; however, a single phase program should initially be developed.

Phase 1: AQMP as a comprehensive plan that is multi-pollutant-based and which addresses all critical air pollution issues within a State. It would include:

- individual/integrated SIPs (that considers HAP), as required by the CAA
- sector-based reductions of HAP and criteria pollutants
- plans for visibility protection (e.g., regional haze SIPs) and ecosystem protection
- plans for addressing local environmental issues
- plans to address issues that relate to air quality (e.g., energy policy, climate change, transportation, and land use)

Phase 2: If later determined necessary for better synchronization of SIP due dates or other needs, revise CAA

Phase 1 Issues that Need to be Addressed

General:

- Discuss how to move toward State development of AQMPs though not a CAA requirement (e.g., by providing economic incentives, other incentives, …)

Regulatory coverage:

- What federal requirements besides NAAQS and regional haze would be addressed in the AQMP (e.g., toxics, ecosystems)?
- Need to address federal enforceability of AQMP (i.e., which parts are federally enforceable)
-
- Need to encourage inclusion of programs to address regional, state, and local air quality issues
- How would the AQMP be best developed to be useful for multi-state planning?

Planning cycle:

- When would the first AQMP be submitted? (examine opportunities under current CAA; see Table 1 for example timeline)
- How often would AQMPs be updated (timing for major revisions and mid-period corrections/reviews)?
- Discuss how to align SIP submittal dates, to be compatible with each other and with an AQMP
- Discuss how the timing of SIP submittals might be changed to encourage an AQMP without weakening requirements for attaining standards
- Discuss need for changes, if any, to timing of NAAQS review process to facilitate AQMP.
- How would NAAQS revisions and new information on health and other effects be adopted into AQMP, with regard to AQMP planning schedule?
- How would EPA SIP approval affect planning cycle?

Additional Phase 2 Issues

- Is there a need to amend the CAA to allow better synchronization of the SIP due dates after a new or revised NAAQS?
- Are other CAA changes needed?

Table 1. Comparison of Timing for SIP Approach versus Example Phase 1 & 2 AQMP Approaches

Milestone	**1997 $PM_{2.5}$ NAAQS**	**1997 8-Hr O3 NAAQS**	**Comprehensive AQMP, Phase 1 PM/Ozone SIPs[1]**	**Comprehensive AQMP, Phase 2 [2]**
Effective date of Standard	Sept. 1997[3]	Sept. 1997		
Monitoring Data Used for State Recommendations	2001-2003	2001-2003	2001-2003 $PM_{2.5}$ 2001-2003 Ozone	2001-2003 $PM_{2.5}$ 2001-2003 Ozone
State recommendations to EPA	Feb. 2004	July 2003	July 2003 Ozone Feb. 2004 $PM_{2.5}$	July 2003 Ozone Feb. 2004 $PM_{2.5}$
Effective Date of Designations	April 2005[4]	June 2004	April 2005 $PM_{2.5}$ June 2004 Ozone	April 2005 $PM_{2.5}$ June 2004 Ozone
SIPs due	Sept. 2006 CAIR Dec. 2007 Reg. Haze April 2008 PM2.5[5]	Sept. 2006 CAIR July 2007 Ozone	Sept. 2006 CAIR Dec. 2007 Reg. Haze July 2007 Ozone April 2008 $PM_{2.5}$	Not applicable in this scenario
1st AQMP due			Dec. 2007[6]	Dec. 2007[7]

[1] Phase 1: Assumes a 7-yr fixed schedule, as an example. For this approach to be adopted, extensions on $PM_{2.5}$ SIP submittal dates and/or incentives for meeting the earlier $PM_{2.5}$ SIP submittal dates for both PM2.5 and ozone SIPs would need to be given.
[2] Phase 2: Issues need to resolved; this approach requires CAA amendments.
[3] For the current $PM_{2.5}$ NAAQS, there will be an approximately 9-year interval (1997-2006) for the NAAQS review process rather than the 5-year interval mandated by the CAA. The 2006 PM NAAQS promulgation date (Sept. 27, 2006) was set by consent decree.
[4] EPA has up to 3 years to promulgate designations (State has up to 1 year of those 3 to submit list of areas to EPA). For $PM_{2.5}$ designations, this took 8 years from promulgation.
[5] From $PM_{2.5}$ NAAQS promulgation to SIP submission will be 11 years (1997-2008).
[6] This date is based on a 7-yr interval that begins December 2007. This AQMP would incorporate joint/integrated SIPs for the $PM_{2.5}$ NAAQS, 8-Hr O2 NAAQS, CAIR, and regional haze, and also recognize potential NAAQS revisions.
[7] This AQMP would include integrated implementation plans for the $PM_{2.5}$ NAAQS, 8-Hr O2 NAAQS, CAIR, and regional haze, and also recognize potential NAAQS revisions.

Milestone	**1997 $PM_{2.5}$ NAAQS**	**1997 8-Hr O3 NAAQS**	**Comprehensive AQMP, Phase 1 PM/Ozone SIPs[1]**	**Comprehensive AQMP, Phase 2 [2]**
Attainment Date	April 2010	June 2007 up to June 2024	April 2010 $PM_{2.5}$ June 2007 up to June 2024 Ozone	April 2010 $PM_{2.5}$ June 2007 up to June 2024 Ozone
Attainment Date with extension	Up to April 2015		Up to April 2015 $PM_{2.5}$	Up to April 2015 $PM_{2.5}$
2nd AQMP due			Dec. 2014	Dec. 2014

Appendix: Final Papers from Team 1 Issue Group 3

TEAM 1: Group 3
Proposed Coordination Strategies for Air Quality, Land Use, Energy, Transportation and Climate

[NOTE TO READER: This document represents Group 3's final work product. It contains seven recommendations and reflects changes made to address Subcommittee feedback provided at and following the June Atlanta meeting.]

INTRODUCTION

The Subcommittee on Air Quality Management ("AQM Subcommittee") is developing recommendations for long-term changes to the air quality management system based on the National Research Council's recommendations in its 2004 report entitled "*Air Quality Management in the United* States". Team 1 to the AQM Subcommittee is designing a proposed process for managing air quality and has divided its work into various issue areas. We were asked to address Issue 3. Specifically, *we were asked to propose ways in which the AQM framework of the future should coordinate with other programs such as land use, energy, transportation and climate*.

Land use, transportation and energy policies and programs are intertwined with air quality policies and programs. Specifically, land use, transportation and energy policies and programs can conflict with or frustrate attaining national air quality goals. Conversely, air quality policies and programs can conflict with or frustrate national transportation and energy goals. With these basic understandings in mind, the guiding principal for Issue 3 is that our nation's land use, transportation and energy policies and programs and our nation's air quality policies and programs must be aligned to serve consistent objectives.

During Group 3's discussions, there was considerable debate regarding the extent to which Group 3 should address climate. Some stakeholders believed that it was inappropriate for the AQM Subcommittee to address climate in any manner. Other stakeholders believed that it was essential for the AQM Subcommittee to address climate. After significant discussion, the Group 3 stakeholders agreed to a compromise position. Specifically, for purposes of the draft proposals set forth below, Group 3 agreed to pursue recommendations focused on information gathering and coordination and recommendations that recognized, without undermining, the various climate initiatives underway at state and local levels. Group 3 agreed that it would not entertain recommendations that mandate or advance climate change policy or proposals that give the United States Environmental Protection Agency ("EPA") a preemptive or preeminent role in climate change programs or policies.

RECOMMENDATION 1: THE AQM PROCESS SHOULD SUPPORT TRANSPORTATION AND LAND USE SCENARIO PLANNING AT THE MULTI-JURISDICTIONAL, TRIBAL AND LOCAL LEVELS AND OTHER MEANS TO IDENTIFY EMISSIONS REDUCTION OPPORTUNITIES AND IMPROVE TRIBAL AND LOCAL ENGAGEMENT.

BACKGROUND/EXPLANATION: Tribal and local governments have critical control and approval authority over land use choices that significantly impact air pollution, transportation systems (which some would argue is the most critical driver of locally controlled development), air pollution, energy use and greenhouse gas emissions. Multi-jurisdictional planning organizations[1] are also significantly involved in local land use and transportation planning in several ways, including by providing technical planning support to local governments. For example, tribal and local governments and multi-jurisdictional planning organizations have the power to determine or influence the way in which land is developed, how auto use and transportation patterns evolve, which land is opened to development, and whether local funds and land use are used to support mass transit, rather than discourage it. Some may also influence whether energy efficiency or demand side management techniques are required or implemented (e.g., in residential and commercial development). There is no single Federal requirement for coordination among transportation, land use and air quality, although metropolitan and statewide transportation planning must address land use and air quality factors and the transportation conformity process seeks to conform transportation planning to the SIP's purpose of reducing violations and contributing to attainment of national ambient air quality standards. By virtue of their role in these multiple areas, multi-jurisdictional planning organizations and tribal and local governments have a unique opportunity to coordinate air quality, land use, energy, transportation and climate programs. For these and other reasons, Recommendation 1 is that multi-jurisdictional planning organizations and tribal and local governments should be an integral part of the AQM process.

Group 3 recognizes that considerations such as quality of life are often the drivers for tribal and local governments (often with the support of multi-jurisdictional planning organizations) to recommend and adopt land use and other practices that are also good for air quality. Group 3 believes that EPA can play a constructive role in supporting such practices by providing tools and resources to assess air quality benefits of alternative land use scenarios.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) meeting the NAAQS for ozone and PM2.5 and reducing regional haze; (2) addressing air quality on the appropriate geographic scale (locally, regionally and globally); (3) addressing remaining pollution problems, including unregulated and smaller "area sources," and (4) coordinating air quality, energy, transportation and urban planning strategies.

[1] For purposes of Recommendation 1, "multi-jurisdictional planning organizations" include, but are not limited to, multi-state organizations such as State DOTs, MPOs, RPOs, COGs, nonprofit planning organizations and independent system organizations.

NAS RECOMMENDATION ADDRESSED: This recommendation addresses and/or supports the following NAS recommendations: (1) expand national and multistate performance-oriented control strategies to support local, state and tribal efforts; and (2) transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO: 1 (This recommendation includes an examination of the advantages of scenario planning. Any future proposal for mandatory scenario planning would need to respect responsibilities of different levels of government. Statutory changes would be required to achieve mandatory scenario planning.)

RECOMMENDED ACTIONS:

In order to achieve enhanced multi-jurisdictional planning organization and tribal and local government involvement in the AQM process and better coordination of AQM, land use, energy, transportation and climate programs, the AQM process should be modified so that multi-jurisdictional planning organizations and tribal and local government choices are better integrated with, and become a meaningful input into, Federal, State and Tribal AQM processes. In order to accomplish this objective:

A. EPA should encourage States and Tribes to coordinate with multi-jurisdictional planning organizations and tribal and local governments, including by aligning planning schedules at the State and local levels. EPA should provide resources to multi-jurisdictional planning organizations and tribal and local governments so that they can better understand the impact that their land use, energy, and transportation decisions will have on air quality and greenhouse gas emissions. To that end, EPA (in consultation and coordination with DOT, EPA, States and Tribes) should assist where appropriate in linking up multi-jurisdictional planning organizations and tribal and local governments that are actively implementing integrated planning approaches (e.g., Sacramento, Portland, Chicago, Minneapolis) with those that are considering but not yet implementing such approaches (e.g., Atlanta).

   Additionally, EPA (drawing on outside expertise) should develop a clearinghouse of planning related resources and tools. Over the longer term multi-jurisdictional planning organizations and tribal and local governments need more sophisticated transportation and land–use models that adequately capture local land design issues, bicycle and pedestrian travel and induced demand. These models will need to be supported by high quality, sufficiently disaggregated land use and travel data. In the short term, regions, communities and tribal entities need scenario analyses and visioning tools that allow them to understand, visualize and quantify the opportunity costs of business-as-usual development trends and the benefits of more efficient transportation and land use scenarios. It is important to respect that local land use and transportation infrastructure decisions are typically driven more by quality of life and economic concerns than by air quality and environmental issues. Thus it is critical that scenario analysis tools address multiple factors (such as emissions, mobility,

consumer fuel costs, water quality, infrastructure costs, etc.) of concern to the public elected officials, and the private sector.

B. EPA (in partnership with States, Tribes and DOT and in consultation with other interested stakeholders) should encourage multi-jurisdictional planning organizations and tribal and local governments to conduct a visioning and scenario planning process in which the area in question decides where it wants to be in X years with regard to land use, transportation and energy and adopts a plan to incorporate the necessary policies and ordinances that further its vision. These efforts should be coordinated with and supported by the transportation planning process. This could produce an "integrated" strategy that addresses land use, energy and transportation in a manner that is directionally correct for air quality or explicitly tied to attainment. Moreover, as part of their visioning and scenario planning process, multi-jurisdictional planning organizations and tribal and local governments should be encouraged to work with state and/or tribal planning organizations to identify strategically-located local communities that are appropriate for new fuel and energy generation, storage, transportation technologies and facilities, and infrastructure requiring changes to the existing land and built environment.

C. EPA (in partnership with States, Tribes, and DOT and in consultation with other interested stakeholders) should explore the advantages and disadvantages of mandatory and voluntary visioning and scenario planning that, among other things, identifies the environmental benefits and detriments of various land use choices. Such a program could be conducted as part of the multi-jurisdictional planning organization's or tribal or local government's transportation planning and air quality planning process.[1] If it is determined that a mandatory program is appropriate, significant changes would be required not just to the AQM system, but to the transportation planning and conformity processes and underlying statutes.

D. EPA should allow SIP/TIP credit and make available other forms of recognition or alternative "credit" for multi-jurisdictional planning organizations and tribal and local governments that revise their land use laws consistent with EPA's model goals and ordinances, or that implement quantifiable land use, energy or transportation technologies or approaches that benefit air quality.

IMPLEMENTATION:

For Recommendation A, to link up multi-jurisdictional planning organizations and tribal and local governments on integrated planning approaches, EPA should develop a plan in consultation with States, Tribes, DOT and the various associations that represent municipalities (e.g., National Association of Regional Councils). The plan should include a mechanism for facilitating communication and scheduling between and among

[1] A recommendation to mandate scenario planning for Transportation Improvement Plans and Long Range Transportation Plans was initially developed by a group of transportation, land use and air quality experts convened by the Center for Clean Air Policy and the Local Government Commission in December 2004. See http://www.ccap.org/transportation/smart_two.htm for more information.

multi-jurisdictional planning organizations and tribal and local governments, as well as issuing guidance.

Further, with respect to the clearinghouse of planning resources, EPA (drawing on outside expertise) should gather items that will help multi-jurisdictional planning organizations and tribal and local governments achieve planning and development practices that benefit air quality. The clearinghouse of resources should include, without limitation:

1) Modeling software that enables multi-jurisdictional planning organizations and tribal and local governments to model current and alternative land use patterns, energy trends and transportation options so that they can study how different future land use, energy and transportation scenarios would impact future emissions;
2) Modeling software that enables multi-jurisdictional planning organizations and tribal and local governments to quantify the emission reductions associated with certain land use, energy and transportation technologies or approaches;
3) On-line tutorials and manuals for using modeling software;
4) Model codes and ordinances that benefit air quality (e.g., model codes and ordinances that promote increased urban density, multiuse clustering, energy efficiency and public transportation);
5) Guidebooks that identify land use, energy and transportation technologies or approaches that benefit air quality and establish certain minimum steps that multi-jurisdictional planning organizations and tribal and local governments must take to obtain State Implementation Plan (SIP) or Tribal Implementation Plan (TIP[2]) credit when pursuing such technologies and approaches;
6) Model educational and citizen involvement practices; and
7) Guidebooks that identify funding opportunities for innovative land use, energy and transportation approaches.

In assembling this clearinghouse EPA should determine what resources have been developed and what items need to be enhanced or developed. EPA and the Federal Highway Administration (FHWA) currently provide some technical assistance and guidance on scenario planning tools and integrating transportation and land use planning. Increasing awareness of these existing tools will be straightforward and low cost. For the tools needing to be enhanced or developed, EPA should decide which ones to develop first based on stakeholders' needs.

To help ensure these tools are readily accessible to multi-jurisdictional planning organizations and tribal and local governments, EPA should make the clearinghouse available in a central place on the web. EPA should also consider featuring the tools at a conference with a particular emphasis on creating champions or advocates such as local politicians and land planners who can utilize the information to promote beneficial land-use practices in their respective communities.

[2] Throughout this document TIP refers to Tribal Implementation Plan and not Transportation Improvement Program.

The clearinghouse and the other recommendations in this proposal are intended to deepen current support and systematize it so that the benefits of these tools and approaches can be implemented more broadly. As such, the clearinghouse will require additional staff and financial resources for implementation, especially for new tool development.

For Recommendations B and C, to improve the effectiveness of scenario planning, EPA should partner with States, Tribes, local governments and DOT to support pilot transportation and land use scenario analyses in a few metropolitan regions across the U.S. These pilot efforts would test the premise that alternative scenario analyses can identify cost-effective emissions reduction options that would otherwise be missed in the current system that does not explicitly consider land use as a policy variable. In addition, the pilots would assess whether scenario analyses yield persistent emission reduction strategies that will help maintain air quality and aid in meeting future SIP/TIP objectives. These pilot efforts should be designed to fully understand what is involved with making it a mandatory feature of AQM and inform how a scenario analysis requirement would be structured and implemented. EPA should partner with States, Tribes and DOT in this effort of piloting scenario analyses and in determining what next steps would be necessary to make use of scenario planning more widespread, including consideration of whether making such analyses mandatory should be proposed.

For Recommendation D, EPA should give States and Tribes the option to include the visioning and scenario planning process as an input into their SIPs or TIPs in one of three ways: as a measure in the baseline, a measure warranting credit, and/or a growth assumption. EPA has developed several useful guidelines for calculating SIP and TIP credit. For example, EPA has provided guidance on SIP credit for emission reductions from electric sector energy efficiency and renewable energy projects and plans to provide guidance on SIP credit for Emission Reductions from Highway and Off-Road Diesel Vehicles and Retrofits. EPA should continue developing guidelines for calculating SIP and TIP credit associated with other land use, energy and transportation technologies and approaches and should work with EPA regional offices and in consultation with States and Tribes to follow such guidelines for purposes of SIP and TIP planning and development. Specifically, EPA should develop guidance that explains how areas can get SIP/TIP credit for well documented land use measures that multi-jurisdictional planning organizations and tribal and local governments adopt that yield emission reductions. EPA should also develop new guidance to allow SIP/TIP credit where the total reductions for voluntary strategies would exceed the 3 or 6 percent under current guidance. See Group 3's Recommendation 2 for implementation measures that EPA could pursue to further credit and other recognition programs outside the SIP/TIP process.

BENEFITS: Current land use and transportation decisions will impact emissions over many decades. Providing multi-jurisdictional planning organizations and local and tribal governments with tools and resources to better understand the interaction among land use, transportation, energy and GHG emissions will empower them to make better decisions over the short and long-terms. Alternative transportation and land use scenario analyses have been used to identify cost-effective emissions reduction options that would

otherwise be missed in the current system that does not explicitly consider land use as a policy variable. In addition to emissions benefits, smart growth policies can yield multiple benefits on issues of significant public and private sector concern including: energy security, exposure to traffic congestion, ecosystem preservation, reduced infrastructure costs and protection of water resources.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: mobile, stationary and area

TOOLS NEEDED: The tools needed are described in detail in the "Implementation" section above and cover issues related to better understanding and addressing the interactions among transportation, land use, energy, air quality and GHG emissions.

PRIORITY: High. Improved tools and understanding of the effects of current development patterns is needed. Given the long-term impacts of land development and transportation decisions, delayed action on smart growth measures will continue impacts of development patterns well into the future.

RECOMMENDATION 2: 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.

BACKGROUND/EXPLANATION: The AQM process should include incentives for voluntary and innovative land use, energy, and transportation technologies or approaches that benefit air quality in nonattainment and other areas. Innovative technologies and approaches that should be encouraged include, without limitation, low emission technologies, smart growth, energy efficiency measures, cogeneration, demand-side management and renewable resources. The AQM process should better integrate incentives that encourage these technologies and approaches into the NAAQS implementation process. Incentives could include, but are not limited to:

- more flexible forms of SIP and TIP credit,
- regulatory incentives (such as expedited or streamlined permitting opportunities) and economic incentives (such as tax incentives, public benefits programs,
- state and utility funding programs for energy efficiency projects), where appropriate and properly structured, and
- recognition programs or forms of alternative "credit" for communities that implement voluntary and/or innovative land use, energy or transportation policies, programs or practices that benefit air quality.

While EPA has already developed incentives for voluntary and innovative measures that address the above objectives (e.g., 2001 Economic Incentive Guidance), many stakeholders are unaware of these programs.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) meeting the NAAQS for ozone and PM2.5 and reducing regional haze; (2) addressing air quality on the appropriate geographic scale (locally, regionally and globally); (3) addressing remaining pollution problems, including unregulated and smaller "area" sources; and (4) coordinating air quality, energy, transportation and urban planning strategies.

NAS RECOMMENDATION ADDRESSED: This recommendation addresses and/or furthers the following NAS recommendations: (1) expand national and multistate performance-oriented control strategies to support local, state and tribal efforts; and (2) transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO: 1, 2 or 3 depending on the incentive (e.g., self certification incentives would be Bin 1, permit streamlining would be Bin 2, and tax credits would be Bin 3)

RECOMMENDED ACTIONS:

A. EPA should develop a communication strategy to inform interested stakeholders about those programs that already exist. (Identification and development of communication tools to disseminate information regarding existing programs intended to motivate voluntary and innovative technologies and approaches is referred to Team 1, Group 4.)

B. EPA should continue to develop new programs that motivate voluntary and innovative measures. Appropriate and properly structured incentive programs such as expedited and streamlined permitting opportunities, the Texas TERP program, EPA's Performance Track Program, and innovative measures such as voluntary mobile emissions reduction programs ("VMEP") and projects funded by Congestion Mitigation and Air Quality (CMAQ) funds can, in the aggregate, make greater overall contributions to future SIPs and TIPs than they have in the past. (Identification and development of tools to motivate voluntary and innovative technologies and approaches is referred to Team 2.)

C. Current SIP approval requirements have recently been made incrementally more flexible in crediting such measures, but they still require a ton-denominated precursor reduction applied to each such measure. The AQM process should establish more flexible forms of credit for such measures. EPA should assist in determining and providing SIP and TIP credits for energy efficiency and renewable energy programs.

D. With respect to community recognition programs, EPA should compile a list of existing recognition programs (e.g., Indiana CLEAN Community Challenge), their strengths and weaknesses and what the recognizing entity offers as an incentive to areas that implement environmentally beneficial measures (e.g., technical assistance, public recognition, cash awards). Drawing from this research, in partnership with other organizations that work with local governments, EPA should develop a community recognition or other alternative "credit" program for nonattainment and other areas that adopt voluntary and/or innovative land use, energy or transportation policies, programs or practices that benefit air quality. EPA should develop clear criteria for how an area would qualify for this recognition or alternative "credit".

IMPLEMENTATION: Recommendations A and B are referred to Team 1 Group 4 and Team 2, respectively. For Recommendation C, EPA should consider the predicted effects of a package of measures presented in a SIP or TIP, potentially over a longer time horizon than the SIP review period. Specifically, EPA should identify or develop model land use, transportation and energy planning documents that address SIP/TIP credit issues applicable to each voluntary and innovative measure that Team 2 identifies pursuant to Recommendation B. Among other things, the model documents should demonstrate how to quantify emission reductions expected from each identified measure in a manner where they can be considered for SIP or TIP credit. EPA should also encourage adaptive plan

revisions as indirect effects of innovative measures become better understood, which is consistent with current SIP requirements for reasonable emission reduction progress checks. The implementation challenge for this recommendation will be identifying appropriate targets for emission reduction initiatives and quantifying the air quality benefits expected or actually achieved as a result of any one initiative.

BENEFITS: This recommendation shifts the focus for new programs away from traditional command and control strategies to strategies that are the most likely to be effective in achieving additional air pollution gains in the areas of land use, transportation and energy planning.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: mobile, stationary and area

TOOLS NEEDED: Recommendations A and B are referred to Team 1 Group 4 and Team 2, respectively. For Recommendation C, EPA should identify or develop model land use, transportation and energy planning documents that could be applied in other jurisdictions for SIP/TIP credit.

PRIORITY: High

RECOMMENDATION 3: 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.

BACKGROUND/EXPLANATION: Land use, transportation and energy policies and programs are inextricably intertwined with air quality policies and programs. Specifically, land use, transportation and energy policies and programs can conflict with or frustrate attaining national air quality goals. Conversely, air quality policies and programs can conflict with or frustrate national transportation and energy goals.

Federal agencies already coordinate their activities to some extent. For example, when EPA undertakes a major rulemaking, the Office of Management and Budget's (OMB) Office of Information and Regulatory Affairs (OIRA) facilitates an inter-agency review process to ensure other federal agencies have an opportunity to review and provide comment on EPA rulemakings. Moreover, Executive Orders 13211 (May 18, 2001) and 12866 (September 30, 1993) require Federal agencies to prepare a Statement of Energy Effects when undertaking certain actions that promulgate or are expected to lead to the promulgation of a final rule or regulation that is likely to have a significant adverse effect on the supply, distribution or use of energy. A Statement of Energy Effects must include, among other things, detailed information regarding any adverse effects the agency action will have on energy supply, distribution, or use (including a shortfall in supply, price increases and increased use of foreign supplies). OIRA uses the Statements of Energy Effects to ensure that one federal agency's proposed actions do not conflict with another agency's policies or actions. Federal agencies must also publish their Statements of Energy Effects, or a summary thereof, in each Notice of Proposed Rulemaking and in any resulting Final Rule.

With the objective of enhancing the above efforts and facilitating earlier and more meaningful coordination between federal agencies and national programs and objectives, an Inter-agency Liaison Group ("ILG") should be established based on the guiding principal that our nation's land use, transportation, energy, greenhouse gas and air quality programs and objectives must be aligned to serve consistent goals. The ILG should include EPA and several other Federal agencies such as FAA, HUD, DOE, NRC, FERC, USDA, CDC, DOI and DOT.

The creation of a Federal coordination group has precedent. In the late 1970s EPA participated in the Interagency Regulatory Liaison Group or "IRLG." The IRLG brought together high level officials from EPA and other federal agencies to talk about policies and other issues of common concern. At least two current Air Quality Management Subcommittee members recall participating in the effort and feel it was highly effective.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) coordinating air quality, energy, transportation and

urban planning strategies and (2) maintaining AQM efficiency in the face of changing climate.

NAS RECOMMENDATION ADDRESSED: This recommendation addresses the following NAS recommendation: transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO: 1

RECOMMENDED ACTIONS: An Inter-agency Liaison Group (ILG) 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 and aligning Federal agency goals and objectives on energy, land use, transportation, greenhouse gases and air quality. The purpose of the ILG would be to help ensure Federal agencies work together in achieving coordinated and integrated solutions to these issues.

In addition to periodically meeting, sharing information and working to align national programs and objectives, the ILG should work with OMB, CEQ and other interested stakeholders to develop a protocol under which federal agencies would (a) formally analyze major proposed federal rulemakings are likely to have significant impacts on national land-use, energy, transportation, greenhouse gas and/or air quality programs or objectives; (b) for those proposed major regulations that are likely to have such significant impacts, prepare Statements of Effects similar in content to the Statements of Energy Effects that Executive Orders 13211 (May 18, 2001) and 12866 (September 30, 1993) currently require; and (c) subject such Statements of Effects to public review and comment.

IMPLEMENTATION: The ILG should be established at the political or senior career level. It should include representatives from EPA's air office and from other Federal agencies such as FAA, HUD DOE, NRC, FERC, USDA, CDC, DOI and DOT. EPA should also create a lower level working group to implement the recommendations of the ILG. The ILG should use a Memorandum of Understanding (MOU) or other vehicle to establish a common understanding of its purpose and activities. The ILG should meet at least quarterly to share information and coordinate policies and programs.

In exploring and developing a protocol for analyzing and disseminating information regarding major proposed federal rulemakings, the ILG (working with OMB, CEQ and other interested stakeholders) should consider and address several issues, including what proposed federal regulations are covered and the appropriate scope and extent of analysis and public participation. In addition, to avoid duplicative analyses, to the extent that a federal agency is required to prepare an impacts analysis pursuant to another statutory or regulatory requirement (e.g., the National Environmental Policy Act) that is substantially similar to the analysis that the protocol requires, the protocol should allow the federal agency to use that analysis in lieu of preparing a new duplicative impacts analysis.

BENEFITS: This recommendation encourages policy makers to better coordinate national air quality, energy, transportation and greenhouse gas programs and objectives. The rulemaking protocol contemplated by this recommendation would provide policy makers and interested stakeholders information on significant impacts proposed major federal rulemakings would have on national air quality, energy, transportation and/or greenhouse gas programs and objectives. This information would allow policy makers and interested stakeholders to understand the degree to which proposed major federal rulemakings would further or undermine national air quality, energy, transportation and greenhouse gas programs and objectives, including identifying opportunities to reduce the potential for adverse air quality impacts.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: mobile, stationary and area; federal agencies

TOOLS NEEDED: None immediately apparent; will depend on what initiatives ILG pursues.

PRIORITY: High

RECOMMENDATION 4: DEVELOP PROGRAMS THAT FOCUS ON REDUCING PUBLIC DEMAND FOR POLLUTING ACTIVITIES. SUCH PROGRAMS COULD INCLUDE INCENTIVE PROGRAMS FOR ENCOURAGING USE OF LOWER-POLLUTING ACTIVITIES, REDUCTION PROGRAMS, AND TAX AND USE RESTRICTIONS.

BACKGROUND/EXPLANATION: Most of our air quality management is directed at large scale sources of pollution, such as major industrial emitters. Although additional reductions from such sources are possible, further reductions may be achieved by encouraging the public to reduce activities that produce pollution or to pursue less polluting alternatives.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) meeting the NAAQS for ozone and PM2.5 and reducing regional haze; (2) addressing air quality on the appropriate geographic scale (locally, regionally and globally); (3) addressing remaining pollution problems, including unregulated and smaller "area" sources; and (4) coordinating air quality, energy, transportation and urban planning strategies..

NAS RECOMMENDATION ADDRESSED: The recommendation addresses the following NAS recommendations: (1) expand national and multistate performance-oriented control strategies to support local, state and tribal efforts; and (2) transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO: 1, 2 or 3 depending on the incentive (e.g., education would be Bin 1, permit streamlining would be Bin 2, and tax credits would be Bin 3)

RECOMMENDED ACTIONS:

A. EPA should develop a social marketing and outreach strategy that includes, but is not limited to, helping the public make environmentally beneficial choices and understand the impact their decisions have on air quality. This marketing and outreach strategy should include approaches such as California's 3-star recreational watercraft labeling program and DOT/EPA's "Best Workplaces for Commuters" and "It all Adds Up to Cleaner Air" programs. EPA efforts should discourage activities that create more air pollution and encourage alternative activities that minimize environmental harm. As appropriate, EPA should consult with other Federal agencies and stakeholders in developing the strategies. (Identification and development of outreach strategy referred to Team 1, Group 4.)

B. EPA should evaluate options for discouraging (e.g., education, taxes, fees imposed on federal lands, use restrictions) higher polluting activities and encouraging (e.g., economic incentives, education, expedited or streamlined

permitting opportunities) less polluting activities. For example, energy demand might be reduced through programs that educate the public about energy efficient practices or provide funding for energy efficiency and renewable energy projects. (Identification and development of tools for reducing demand for polluting activities is referred to Team 2.)

IMPLEMENTATION: Recommendation A is referred to Team 1, Group 4. Recommendation B is referred to Team 2. One implementation challenge will be possible resistance from industries that serve the demand for polluting activities. This resistance may be reduced by shaping programs to create opportunities for such industries to serve demand for activities with less air pollution impact.

BENEFITS: This recommendation would reduce air pollution at its source—the demand for activities that cause it. This recommendation would involve the public directly in the decisions individuals make that affect air pollution.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: mobile, stationary and area

TOOLS NEEDED: Recommendation A is referred to Team 1, Group 4. Recommendation B is referred to Team 2.

PRIORITY: High. This recommendation is fundamental to addressing public activities and area sources.

RECOMMENDATION 5: ANALYZING 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.

BACKGROUND/EXPLANATION: Tremendous progress has been made in the U.S. reducing air pollution over the past 30 years using primarily command and control approaches. In addition, there are several environmental and energy statutes that directly or indirectly address energy efficiency, cleaner energy, and renewable energy as a means of achieving air quality objectives under the Clean Air Act. These statutes are amenable to a number of permissible interpretations and the regulations implementing them are amenable to a number of permissible regulatory frameworks.

For example, the Clean Air Act Amendments of 1990 establish prevention as "a primary goal" of the Act (see Title 1, Part A, section 101 (a) (3) and Section 101 (c)). The Act also addresses concerns of multi-media transfer of pollutants.

The Pollution Prevention Act establishes as national policy:

…that pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and that disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Similarly, the Energy Policy Act in Section 2108 (a) (titled Energy Efficient Environmental Program) states:

(a) PROGRAM DIRECTION- The Secretary, in consultation with the Administrator of the Environmental Protection Agency, is authorized to continue to carry out a 5-year program to improve the energy efficiency and cost effectiveness of pollution prevention technologies and processes, including source reduction and waste minimization technologies and processes. The purposes of this section shall be to--

> (1) apply a systems approach to minimizing adverse environmental effects of industrial production in the most cost effective and energy efficient manner; and
> (2) incorporate consideration of the entire materials and energy cycle with the goal of minimizing adverse environmental impacts.

A clean air strategy that takes full advantage of opportunities to use pollution prevention, energy efficiency and renewable energy measures may offer three advantages. First, such an approach could -- with a single investment – reduce multiple emissions and reduce and/or eliminate pollutants and emissions to other media, as well as emissions which are currently unregulated but which may be in the future. Second, viewed from a systems perspective (as the Energy Policy Act dictates) pollution prevention, energy efficiency

and renewable energy measures may be more cost-effective than command and control strategies. Third, pollution prevention, energy efficiency and renewable energy measures may help the United States accomplish important public policy goals outside the environmental and clean air arena, such as energy security, national security and homeland security.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) coordinating air quality and energy strategies; (2) meeting the NAAQS for ozone and PM2.5 and reducing regional haze; and (3) addressing impacts on specific communities (environmental justice).

NAS RECOMMENDATION ADDRESSED: This recommendation addresses the following NAS recommendation: transforming the SIP process into a more dynamic and collaborative performance-oriented, multi-pollutant air quality management plan process.

SCENARIO: 1 (However, the analysis that results from this proposal could require further action under Bins 1, 2 and/or 3)

RECOMMENDED ACTIONS:

A. EPA should examine the scope and extent of pollution prevention-based strategies permissible under the Clean Air Act, Pollution Prevention Act and Energy Policy Act; examine the cost-effectiveness of such strategies as compared to current regulatory strategies; and identify opportunities for taking advantage of pollution prevention-based approaches that may exist in the current legal framework, as well as examining enforceable regulatory requirements which allow for use of pollution prevention strategies where they prove to be more effective from cost- and performance-based perspectives.

B. Where prevention-based strategies offer the opportunity to achieve national goals such as greater energy independence and energy security, and/or where they allow the nation to accomplish reductions in greenhouse gas emissions as an ancillary benefit that impose little or no net cost to the nation, such strategies and authorities -- existing and prospective -- should be identified and delineated.

IMPLEMENTATION: For Recommendation A, EPA should convene a team including the Environmental Law Institute, Energy and Environmental Analysis, Inc. (Joel Bluestein), the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO), National Association of State Energy Officials (NASEO), American Council for an Energy Efficient Economy (ACEEE), DOE's energy laboratories, Electric Power Research Institute, Environmental Council of States (ECOS), and representatives from the tribes, industry and environmental advocacy groups, to thoroughly examine the scope and extent of pollution prevention-based strategies permissible under the Clean Air Act, the Pollution Prevention Act and the Energy Policy Act, including pertinent rules, regulations and other policy documents. The review and analysis should include examples of where

pollution prevention strategies have been tried and used and where opportunities exist to further the use of these prevention-oriented strategies.

Second, for recommendations A and B, EPA should convene an analytical team including EPA, DOE, National Renewable Energy Laboratory (NREL), STAPPA/ALAPCO, NASEO, ECOS, and representatives from the tribes, industry and environmental advocacy groups, to gather all pertinent information and data on the pollution prevention provisions of all pertinent statutes, rules, guidance and other pertinent policies. In addition, the team should gather and analyze performance and cost data on energy efficiency and renewable energy technologies in order to examine their performance and cost-effectiveness as compared to current regulatory strategies in achieving air quality objectives and providing other ancillary benefits.

The above two teams should be asked to merge their findings and any proposed recommendations into a single document and to present that document to EPA and DOE for consideration.

BENEFITS: Meeting air quality objectives (multi-pollutant reductions, including CO2) in the most cost-effective manner; lower compliance costs; lower administrative costs; conservation of fuels and resources; enhanced national and energy security; reduction in greenhouse gases at little or no additional expense; providing new, clean sources of electricity generation; and enhanced local and regional economic development.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: energy sector; energy customers

TOOLS NEEDED: Assembly of the two teams mentioned in the implementation section above. No other tools are necessary.

PRIORITY: High

RECOMMENDATION 6: 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.

BACKGROUND/EXPLANATION: Many States have developed programs to implement energy efficiency/renewable energy measures. Several States have expressed interest in implementing energy efficiency/renewable energy measures to help achieve State air quality objectives. Toward that end, EPA has established the Clean Energy-Environment State Partnership Program, a voluntary state-federal partnership to support State efforts to increase the use of clean energy to achieve environmental, energy and economic benefits.

To support State and local clean energy programs, EPA has issued three key documents:

1. "Guidance on State Implementation Plan Credits for Emission Reduction Measures from Electric-sector Energy Efficiency and Renewable Energy Measures," August 2004 (hereinafter, EPA SIP Guidance);
2. "A Toolkit for States: Using Supplemental Environmental Projects (SEPs) To Promote Energy Efficiency (EE) and Renewable Energy (RE)," January 2005; and
3. "Clean Energy-Environment Guide to Action: Policies, Best Practices and Action Steps for States," February 2006.

The above State and EPA programs and resources and the requirement for State Implementation Plan (SIP) revisions to meet the new 8-hour ozone standard and the fine particulate matter (PM 2.5) standard have created a "window of opportunity" for clean energy/air quality integration, partly through the inclusion of energy efficiency and renewable energy measures into SIPs.

Yet, to date, EPA only has approved one control measure under the August 2004 EPA SIP Guidance. States must submit ozone and PM2.5 SIPs in the next two years, which leaves very little time to accommodate the lengthy process required for incorporating energy efficiency and renewable energy measures into SIPs. The voluntary control measure, approved in an EPA Federal Register notice on May 12, 2005, involved the purchase of wind energy by a buying group led by Montgomery County, Maryland.

There are limited precedents under the August 2004 EPA SIP Guidance for States, Tribes and local governments to follow to pursue aggressive adoption of energy efficiency and renewable energy measures within their SIPs or Tribal Implementation Plans (TIPs). In light of the coming SIP deadlines, EPA should lead the way now to overcome real and perceived obstacles to including energy efficiency and renewable energy measure adoption and inclusion in SIPs and TIPs.

Obstacles result from several factors:

- Some States have indicated that they are unlikely to pursue energy efficiency and renewable energy measures as part of their SIPs to meet the ozone and particulate matter standards because they perceive that only an insignificant amount of SIP credit may be obtained or that EPA requirements (including inconsistent application of requirements across the regions) for documenting the benefits within the SIP will be too burdensome. For example, the EPA SIP Guidance is unclear as to what extent that States and local governments can rely on existing modeling under CAIR to document upwind areas, thereby avoiding the need for extensive new modeling;

- EPA is currently working with the States, Tribal and local governments on incorporating energy efficiency and renewable energy measures into SIPs/TIPs but the effort is not sufficient to provide many State, Tribal and local governments with the necessary assurances that EPA will likely approve their proposals for inclusion of energy efficiency and renewable energy measures into SIPs when they are submitted to the Agency. For example, some EPA Regional offices have provided interpretations of the applicable Guidance that are more restrictive than EPA Headquarters' interpretations;

- Some States, Tribal and local governments do not realize the extent of the opportunities they have for incorporating energy efficiency and renewable energy measures into SIPs/TIPs, and do not realize they can work with EPA Headquarters and Regional Offices on proposals during early SIP planning discussions;

- When a Best Available Control Technology determination in the context of New Source Review (NSR) involves the use of an add-on control device, it appears that some EPA Regional Offices and some States believe that the determination requires that the permittee must always use that control device to achieve the related emission limit. This should not be the case. If after the permit is issued, the permittee is able to achieve the required emission limit without using the control device (e.g. through pollution prevention on reducing material content), the permittee should be permitted to discontinue using that control device. The permittee should also be allowed to eliminate the associated energy use. For example, a permittee with a coating line is initially subject to a BACT determination based on the use of an oxidizer to meet a volatile organic compound (VOC) emission limit. The permittee subsequently reformulates its coating material to use inherently low VOC materials and can now meet the VOC limit without using the oxidizer. The permittee should be allowed to turn off the oxidizer thereby saving energy and eliminating the emissions associated with the oxidizer while at the same time continuing to ensure compliance with the VOC emissions and/or performance limit.

- In addition, a new permit applicant should not be required to install control devices if they are able to comply with a comparable/equivalent BACT limit using other means. For example, if a permittee is able to use a more advanced low NOx burner that has emissions that are comparable to or better than BACT limits, the permittee should not be required to also install an add-on control, such as Selective Catalytic Reduction.

- Incorporation of energy efficiency and renewable energy measures into SIPs/TIPs raises significant national policy issues which require time to resolve. For example, in some locations, due to the nature of the electric grid, it can be challenging to determine how the emissions benefits will occur in locations that are relevant to the non-attainment area in question. Some States are unclear of how to interpret EPA guidance on determining where net emissions reductions need to occur for clean energy measures with respect to a nonattainment area in order for that area to be able to take credit for that measure. There are also unrealized opportunities for regional cooperation to credit the dispersed emissions reductions. Some emission reductions estimated to occur may not be creditable for one non-attainment area, but may be creditable for another non-attainment area in another State;

- Certain States and regional planning organizations are actively considering control measures involving energy efficiency and renewable energy but are concerned that they may be impeded by unforeseen interpretations of the Clean Air Act, EPA regulations and guidance by EPA Regional Offices. For example, the extent of documentation necessary to obtain SIP credit for renewable energy and energy efficiency measures undertaken as part of a Renewable Portfolio Standard or Alternative Portfolio Standard is unclear;

- The relationship between cap and trade programs and SIP credits for energy efficiency and renewable energy actions can be complex. Some State, Tribal and Regional air agencies may not realize that they need to retire allowances to receive SIP credit for NOx emission reductions if the state is subject to the Clean Air Interstate Rule (CAIR). Some state air agencies may not realize that they must create an energy efficiency and renewable energy set-aside or other allocation mechanism under their CAIR implementation rules to obtain SIP credits for energy efficiency and renewable energy measures for the period from 2009 forward.;

- State, Tribal and local governments are in many cases unaware of existing resources on the timing and amount of DOE, EPA, and DOT funding of clean energy/air quality integration measures. Interest by Government and Tribal entities in energy efficiency and renewable energy measures will be greatly enhanced if they are provided accessible information on funding sources; and

- State, Tribal and local governments are facing budgetary constraints that may limit their ability to adopt energy efficiency and renewable energy measures.

Increased provision of information on creative financing approaches (e.g. performance contracting for solar/efficiency in schools) that overcome the financial barriers posed by high upfront capital costs can greatly spur the adoption of energy efficiency and renewable energy measures.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) Meeting the NAAQS for ozone and PM2.5 and reducing regional haze; and (2) coordinating air quality and energy planning strategies.

NAS RECOMMENDATION ADDRESSED: This proposal is responsive to the following NAS recommendations: (1) expand national and multistate performance-oriented control standards to support local, state, and tribal efforts; and (2) transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO:

Recommendations A, B, C, D and E – Scenario 1

Recommendation F -- Scenario 1, 2 or 3; From a legal standpoint, depending on what type of financing scheme is conceived per this recommendation, it may or may not be implementable under the existing Clean Air Act.

RECOMMENDED ACTIONS: EPA should expedite actions to overcome the above barriers to clean energy/air quality integration. All relevant EPA regional and headquarters offices should work with State, Tribal and local air planning organizations to:

A. Communicate with State air agencies, local planning organizations, Tribal governments and related non-profit organizations (ECOS, STAPPA/ALAPCO, NASEO) using different formats such as conference calls and webcasts to determine actual and perceived barriers to clean energy/air quality integration and to resolve policy issues on including energy efficiency and renewable energy measures in SIPs/TIPs;

B. Serve as a facilitator and mediator to ensure a consistent approach encouraging use and incorporation of clean energy measures and to help resolve policy issues and encourage the inclusion of energy efficiency and renewable energy measures into SIPs/TIPs;

C. Engage with State, Tribal and local air planning organizations in early discussions regarding energy efficiency and renewable energy measures being considered for inclusion in SIP/TIP submittals to help resolve any issues of interpretation or other technical concerns, including the reconciliation of the anticipated locations

of the clean energy measure emissions reductions with any SIP requirements contained in EPA guidance and rules specific to particular SIP submissions;

D. Issue guidance confirming that energy consuming control devices may be shutdown if, through pollution prevention, a permittee is able to meet the associated emission limits without using the controls;

E. Clarify that, if a permit applicant plans to use pollution prevention to meet an emission limit that is comparable/equivalent to a limit based on the use of an add-on control device, the applicant is not required to install an add-on control device as well;

F. Provide outreach to EPA Regional officials, State officials and State, Tribal and local governments on the interface between the CAIR regulations and energy efficiency and renewable energy measures in SIPs/TIPs;

G. Define a sample of energy efficiency and renewable energy control measures currently under consideration by State, Tribal and local governments to meet the ozone and PM standards and anticipate and proactively work through the issues that will arise during the SIP/TIP review process. For example, the Control Measures Workgroup of the Technical Advisory Committee of the Metropolitan Washington Air Quality Committee would be one good candidate for such proactive review since this Workgroup already has developed a large group of potential energy efficiency and renewable energy measures;

H. Increase awareness among State, Tribal and local governments of existing funding solicitation opportunities made available by DOE, EPA, and DOT relating to clean energy/air quality, including likely eligibility, funding levels, and amount of awards. This includes making these governments aware of such information sources as the Clean Energy Environment State Partnership online funding guide provided by EPA. EPA should also make funding information available on the EPA Air Innovations web site and other high visibility EPA website locations. This suggestion was presented to EPA at the 2005 Air Innovations Conference and EPA implementation would help overcome a major information barrier.

I. Identify innovative financing strategies (e.g., State performance contracting laws) to assist State, Tribal and local governments in implementing clean energy/air quality integration measures. For example, EPA should make widely available information on the development of financing strategies, such as performance contracting and effective use of tax incentives provided in the Energy Policy Act of 2005, to spur cash-strapped municipalities to adopt energy efficiency and renewable energy measures.

IMPLEMENTATION: For Recommendations A, B, C and F, EPA should convene a standing group to meet on a regular basis. This group should discuss the interface between the CAIR regulations and energy efficiency and renewable energy measures, should be tasked with identifying actual and perceived barriers to clean energy/air integration and should develop recommendations for addressing such perceived barriers. The group should focus on facilitating the implementation of energy efficiency/renewable energy measures across the country and including such measures in SIPs/TIPs, including the CAIR set-aside issue. Membership on the group should include EPA headquarters and regional offices, DOE/NREL, STAPPA/ALAPCO, NASEO, ACEEE, Tribal governments, environmental advocacy groups, industry and others.

For Recommendations D and E, EPA should issue clarifying guidance.

For Recommendations F, H and I, EPA should consult NASEO, DOT, DOE/NREL, ACEEE, States and others to obtain the information, consolidate it and then make it available on an EPA website dedicated to energy efficiency and renewable energy.

BENEFITS: Reducing demand for energy reduces emissions associated with energy production and combustion which benefits air quality. Renewable energy projects can help improve air quality today by offsetting fossil-fuel-fired generation, especially during peak demand.

SECTORS/CATEGORIES RECOMMENDATION APPLIES TO: energy sector and energy customers

TOOLS NEEDED: Recommendations C, D and E would require the creation of new web pages dedicated to energy efficiency and renewable energy issues. No other tools are necessary.

PRIORITY: High

RECOMMENDATION 7: TAKING CLIMATE CHANGE INTO ACCOUNT IN AIR QUALITY MANAGEMENT STRATEGIES.

BACKGROUND/EXPLANATION:

The NAS report sets forth the following discussion on climate change:

> "The earth's climate is warming. Although uncertainties remain, the general consensus among the scientific community is that this warming trend will continue or even accelerate in the coming decades. The AQM system will need to ensure that pollution reduction strategies remain effective as the climate changes, because some forms of air pollution, such as ground-level ozone, might be exacerbated. In addition, emissions that contribute to air pollution and climate change are fostered by similar anthropogenic activities, that is, fossil fuel burning. Multipollutant approaches that include reducing emissions contributing to climate warming as well as air pollution may prove to be desirable."
>
> *Air Quality Management in the United States*, National Research Council (January 2004) at 16.

In addition, during the past several years many cities and States have promoted actions to reduce greenhouse gases. For instance, according to EPA, forty-one States and Puerto Rico have completed greenhouse gas inventories and twenty-eight States and Puerto Rico have completed, or are working on, action plans that identify options for reducing greenhouse gas emissions or enhancing greenhouse gas sequestration. Many cities and states are interested in integrating air quality planning with their climate change programs.

In terms of specific actions undertaken by States to reduce greenhouse gases, California has established greenhouse gas standards for passenger vehicles beginning with the 2009 model year, a move several northeast and west coast States have also adopted. In December 2005 seven northeast States (NY, NJ, CT, ME, NH, VT and DE) formally signed a Memorandum of Agreement to participate in the Regional Greenhouse Gas Initiative (RRGI) which aims to reduce greenhouse gas emissions from the electric generating sector using a cap and trade program. Maryland is also expected to participate in RGGI. California, Oregon and Washington are currently considering similar greenhouse gas control initiatives.

PROBLEMS/CHALLENGES ADDRESSED: This recommendation addresses the following problems/challenges: (1) maintaining AQM efficiency in the face of changing climate; (2) considering the effects of climate change in air quality decision making; and (3) coordinating air quality and urban planning strategies.

NAS RECOMMENDATION ADDRESSED: This recommendation addresses the following NAS recommendations: transform the SIP process into a more dynamic and collaborative performance-oriented, multipollutant air quality management plan process.

SCENARIO: 1

RECOMMENDED ACTIONS:

A. EPA should continue to pursue Recommendation 4.3 from the Phase 1 AQM Report to EPA: "4.3 Greenhouse Gas Co-Benefits and Disbenefits – EPA should assist States, and localities, in quantifying the potential greenhouse gas co-benefits and disbenefits of emissions reduction measures primarily designed to address ozone, PM2.5, regional haze and air toxics. In evaluating control measures, EPA should assist States and localities in quantifying potential greenhouse gas emissions increases and decreases. Many States and localities have adopted policies to assess and/or reduce greenhouse gas emissions. Under this recommendation, where requested, EPA should support a State's or localities efforts to determine how pollution reduction alternatives might also impact greenhouse gas emissions."

B. EPA should undertake a comprehensive assessment of the implications climate change will have on future air quality objectives and include other Federal agencies and climate change expert scientists in that endeavor.[3] The assessment should include estimation of the potential increases in the average and high temperatures during ozone season and the impacts of such increases on ozone formation. The assessment should estimate the air quality impact of secondary effects of temperature increases, such as wildfires, heat island effect, increased electric use, decreased hydroelectric generation and others. The assessment should include an estimation of any additional costs and savings associated with mitigation strategies to address impacts of climate change or temperature increases associated with secondary effects such as wildfires, heat island effect, increased electric use, and decreased hydroelectric generation.

C. EPA should assist states in the development of annual greenhouse gas emission inventories.[4] The Emission Inventory Improvement Program quantification

[3] Aspects of the activities described under "B" are being carried out by EPA. For example, the EPA Office of Research and Development (ORD) initiated a large program in 2001 to assess the impact of climate change on US regional air quality. The EPA STAR Grant program funded 25 projects; ORD and the National Exposure Research Laboratory (NERL) began a large project involving global and regional simulations, involving DOE through a cooperative agreement, and ORD and the National Risk Management Research Laboratory (NRMRL) began development of data resources and tools for emissions projections. These activities will yield results that will be summarized in two assessment reports due in 2007 and 2010, to be produced by ORD and the National Center for Environmental Assessment (NCEA) in collaboration with the Office of Air and Radiation and other key stakeholders.

[4] Aspects of the activities described under "C" are being (or have been) carried out by EPA. For example, at least 42 states have completed their own greenhouse gas emission inventories in partnership with EPA. EPA's draft guidance and draft State Inventory Tool have been instrumental in the progress to date.

guidance should be finalized and made available to states to promote comparability between state inventories.[5] These enhanced inventories should be reflected in the assessment conducted under Recommendation B and enable states to better evaluate the air quality benefits associated with various control strategies. Coordination with greenhouse gas emissions inventories collected by other governmental entities, such as DOE, should be pursued to avoid duplication of efforts and to ensure integrity of the data. EPA, at the request of Tribes or State or local governments, should also provide additional technical assistance to States so they may effectively evaluate greenhouse gas reduction strategies in conjunction with the development of their air quality management plans.

IMPLEMENTATION: Per recommendations A and C, EPA should work with States, local agencies and tribes to provide the necessary technical assistance in regard to assessing greenhouse gas emission co-benefits/ disbenefits and associated air pollution reduction strategies as well as provide States, local agencies and tribes with the improved emission inventory information called for in recommendation C.

For recommendation B, EPA should conduct the comprehensive assessment on the air quality implications associated with climate change in a manner which utilizes the best information available and provide for stakeholder input.

BENEFITS: These three initiatives will provide additional and essential information to States, local agencies and tribes to use in any air quality and climate change program assessment or development they may be pursuing. Recommendation C will provide essential guidance on potential adjustments to be considered in the air quality planning process as a result of climate change.

SECTORS/CATEGORIES RECOMMENTATION APPLIES TO: mobile, stationary and area

TOOLS NEEDED: Currently available technical assessment tools should be sufficient to support all three recommendations.

PRIORITY: High

5 See http://www.epa.gov/ttn/chief/eiip/techreport/volume08/index.html for more information regarding the Emission Inventory Improvement Program.

Appendix: Team 2 Tools Matrix

Tools Matrix

Sources or Sectors (not in priority order)	Recommended Tool Type	Specific Tool Options	Pollutant Targeted
(1) Fleet turnover & diesel retrofits	A. Financial tools and financial demand-side strategies B. Emissions Trading C. Information programs, reward programs and non-financial demand-side strategies D. Planning tools E. Retrofit strategies F. Enforcement enhancements I. Emission limits	A. Tax strategies, loans, equity strategies, and targeted rebates are financing strategies that may encourage fleet turnover (e.g., TERP, DERA, Moyer). B. Emissions trading may offer an appropriate private sector source of financing to accelerate turnover. Approaches that might work best for fleet turnover purposes include inter-sector trading strategies as well as fleet averaging programs. C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Labeling can be used to inform the general public of the choices they are making and to promote the use of new and innovative technologies and resources. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Surveys can be used to gauge the effectiveness of the programs and to inform federal, state, tribal and local entities of program results and market changes. Frequent flyer-type programs can be used to provide incentives for entities that make frequent purchases by offering discounts, rebates, credits or other offerings to promote repeated use of the product(s) being promoted. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions. D. Modeling to estimate the emission reduction benefits of fleet turnover and retrofit is recommended. An inventory of the number of diesel engines that could benefit from retrofit is recommended. E. Retrofit strategies include converting existing engines to an alternative fuel, engine recalibration, adding additional emission controls, replacement with a new, cleaner engine, and anti-idling and other changes in operating strategies that reduce emissions. F. Use SEP funding to encourage fleet turnover and retrofits. Use remote sensing to measure reductions. I. Require mandatory diesel retrofit. Require scrapage programs. Use green contract conditions in government contracts. Use state and federal leadership programs.	PM, NOx, VOCs, CO
(2) Land use & transportation planning (including road exposures)	A. Financial tools and financial demand-side strategies C. Information programs, reward programs and non-financial demand-side strategies	A. Financial demand-side strategies like differential pricing and tax strategies can be used as an incentive. C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Labeling can be used to inform the general public of the choices they are making and to promote the use of new and innovative technologies and resources. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Community "Green Action" lists can be utilized to provide access to tools and information that will help promote the use of more sustainable "Green Community" concepts, including on line tutorials in the use of modeling software, model codes and ordinances, sample plans, community involvement practices and funding opportunities. Surveys can be used to gauge effectiveness of the programs and to inform federal, state, tribal and local	PM, NOx, VOCs, CO

Sources or Sectors (not in priority order)	Recommended Tool Type	Specific Tool Options	Pollutant Targeted
		entities of program results and market changes. Frequent flyer-type programs can be used to provide incentives for entities that make frequent purchases by offering discounts, rebates, credits or other offerings to promote repeated use of the product(s) being promoted. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and Influence decisions.	
	D. Planning tools	D. Provide modeling software for scenario envisioning and to quantify emission reductions. Modeling to project VMT for transportation planning is recommended.	
	H. Targeted strategies	H. Non-measured VOC sources can be detected by thermal IR camera (e.g., floating roof storage tanks, VOC loading racks, pipeline operations, marine vessels and marine loading operations).	
(3) Ships and ports, airports, and rail systems	A. Financial tools and financial demand-side strategies	A. Tax strategies, loans, equity strategies, and targeted rebates are strategies that provide financial incentives to reduce emissions. FAA grants through the VALE program are available.	PM, NOx, VOCs, SO2, HAPs
	B. Emission trading	B. Emissions trading can work together with appropriate emissions performance standards to provide private sector financing and to accelerate engine turnover. Depending upon the overall compliance program, the emissions trading element could consist of one or some combination of a performance averaging program (e.g., by a terminal operator or among fleets), inter-sector trading, banking and a cap and trade program.	
	C. Information programs, reward programs and non-financial demand-side strategies	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions.	
	D. Planning tools	D. Modeling to estimate emission reduction benefits of various strategies is recommended.	
	E. Retrofit strategies	E. Retrofit strategies include converting existing engines to an alternative fuel, engine recalibration, adding additional emission controls, replacement with a new, cleaner engine, and anti-idling and other changes in operating strategies that reduce emissions.	
	F. Enforcement enhancements	F.Use SEP funding to accelerate emission reductions through electrification.	
	H. Targeted strategies	H. Non-measured VOC sources can be detected by thermal IR camera (e.g., floating roof storage tanks, VOC loading racks, pipeline operations, marine vessels and marine loading operations).	
	I. Emission limits	I. Use green contract conditions when facilities are enlarged or rebuilt, or when leases are up. Emission limits would be effective for any source with discrete, measurable points of emissions.	
	J. Work practice standards	J. Imposing work practice restrictions on intermittent sources can be effective to address high ozone levels (like taxiing on one engine).	
(4) Rural Sources			
(a) Agriculture (including potential effect on PM formation and acid deposition)	A. Financial tools and financial demand-side strategies	A. Predicate approval of loans on agreement to implement best management practices (BMPs).	PM, VOCs, ammonia
	C. Information programs, reward programs and non-financial demand-side	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Performance benchmarking can be used to highlight the positive characteristics of new and innovative	

Sources or Sectors (not in priority order)	Recommended Tool Type	Specific Tool Options	Pollutant Targeted
	strategies	technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions.	
	D. Planning tools	D. Permit streamlining replaces redundant and unnecessary requirements in favor of practically enforceable limits that can reduce administrative costs, reduce timing, and improve enforcement. Modeling to estimate emission reduction benefits of various strategies is recommended.	
	E. Retrofit strategies	E. Retrofit strategies include converting existing engines to an alternative fuel, engine recalibration, adding additional emission controls, replacement with a new, cleaner engine, and anti-idling and other changes in operating strategies that reduce emissions.	
	J. Work practice standards	J. Work practice standards (referred to as BMPs) are currently in use and effectively controlling emissions from many agricultural sources.	
(b) Dust	A. Financial tools and financial demand-side strategies	A. Predicate approval of loans on green clauses in development contracts.	PM
	C. Information programs, reward programs and non-financial demand-side strategies	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and Influence decisions.	
	J. Work practice standards	J. Work practice standards are effective tools for dealing with "area" type sources such as dust.	
(5) Small Emitters (e.g., dry cleaners, bakeries, restaurants)	C. Information programs, reward programs, and non-financial demand-side strategies	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Labeling can be used to inform the general public of the choices they are making and to promote the use of new and innovative technologies and resources. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Community "Green Action" lists can be utilized to provide access to tools and information that will help promote the use of more sustainable "Green Community" concepts. Surveys can be used to gauge effectiveness of the programs and to inform federal, state, tribal and local entities of program results and market changes. Frequent flyer-type programs can be used to provide incentives for entities that make frequent purchases by offering discounts, rebates, credits or other offerings to promote repeated use of the product(s) being promoted. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions.	PM, NOx, VOCs, HAPs
	D. Planning tools	D. Permit streamlining replaces redundant and unnecessary requirements in favor of practically enforceable limits that can reduce administrative costs, reduce timing, and improve enforcement. Assessing inventory and population density is recommended.	
	H. Targeted strategies	H. Non-measured VOC sources can be detected by thermal IR camera (e.g., floating roof storage tanks, VOC loading racks, pipeline operations, marine vessels and marine loading operations).	
	I. Emission limits	I. Emission limits would be effective for any source with discrete, measurable points of	

Sources or Sectors (not in priority order)	Recommended Tool Type	Specific Tool Options	Pollutant Targeted
		emissions. With very small sources, it may not be cost effective to conduct routine or continuous source sampling.	
	J. Work practice standards	J. Work practice standards would be an effective alternative to emission limits for most of these sources.	
(6) Consumer Products (e.g., VOC-containing consumer products)	A. Financial tools and financial demand-side strategies	A. Financial strategies such as targeted rebates have proven successful.	PM, NOx, VOCs, SO2, HAPs
	B. Emissions trading	B. One or more emissions trading tools may be effective in this area, including averaging and banking..	
	C. Information programs, reward programs, and non-financial demand-side strategies	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Labeling can be used to inform the general public of the choices they are making and to promote the use of new and innovative technologies and resources. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Community "Green Action" lists can be utilized to provide access to tools and information that will help promote the use of more sustainable "Green Community" concepts. Surveys can be used to gauge effectiveness of the programs and to inform federal, state, tribal and local entities of program results and market changes. Frequent flyer-type programs can be used to provide incentives for entities that make frequent purchases by offering discounts, rebates, credits or other offerings to promote repeated use of the product(s) being promoted. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions.	
	I. Emission limits	I. Emission limits would be effective for any source with discrete, measurable points of emissions. With very small sources, it may not be cost effective to conduct routine or continuous source sampling.	
(7) Industrial, Commercial and Residential Boilers and Heaters, and Legacy Equipment and Sources	B. Emissions trading	B. Emissions trading tools such as plant-wide applicability limits may be effective.	PM, NOx, VOCs, SO2
	C. Information programs, reward programs, and non-financial demand-side strategies	C. Clearinghouses can disseminate information on technology and incentives to educate and promote the use of technologies that have a positive impact on air quality. Labeling can be used to inform the general public of the choices they are making and to promote the use of new and innovative technologies and resources. Performance benchmarking can be used to highlight the positive characteristics of new and innovative technologies through comparison of these technologies against standard market practices and/or the continued use of existing products. Surveys can be used to gauge effectiveness of the programs and to inform federal, state, tribal and local entities of program results and market changes. Web tools can be used to move product information. This information can be targeted to a specific audience or for general consumption to inform, promote, educate and influence decisions.	
	D. Planning tools	D. Permit streamlining replaces redundant and unnecessary requirements in favor of practically enforceable limits that can reduce administrative costs, reduce timing, and improve enforcement. Modeling to estimate emission reduction benefits of various strategies is recommended. Inventory assessment is recommended.	
	I. Emission limits	I. Emission limits can be an effective tool to address these types of sources.	
	J. Work practice standards	J. Work practice standards might be an effective alternative to emission limits for some of these sources.	