

WILL IT BE SAMI So-So? *Caution Warranted on New Air-Quality Studies*

Summary: The Southern Appalachian Mountain Initiative (SAMI) is a consortium of eight Southeastern states, including North Carolina, and several federal agencies. It is now beginning to publish its research, more than a decade in the making, and will likely help to shape the debate on air quality for years. State policymakers should be cautious in interpreting SAMI data and analyses, however, due to troubling signs that it may not be looking at both sides of the regulatory equation.

200 West Morgan St.
Raleigh, NC 27601
Voice: (919) 828-3876
Fax: (919) 821-5117
www.johnlocke.org

The Southern Appalachian Mountain Initiative was formed in 1992 “to identify and recommend reasonable measures to remedy existing and prevent future adverse effects from human induced air pollution on the air quality related values of the Southern Appalachians.” SAMI is made up of consortium of eight Southeastern states (see map), the U.S. Environmental Protection Agency, the National Park Service and the U.S. Forest Service. Also part of this consortium are environmental advocacy groups and some industry representatives.

Its mission is to formulate environmental policy proposals to be considered and possibly implemented by the SAMI supporting states. After a decade of study SAMI is in the process of issuing alternative policy strategies along with their assessment of the costs and benefits of these strategies. State legislators in North Carolina and throughout the Appalachian region should view this analysis with caution and skepticism before acting to implement any of the proposals that SAMI is putting forth.

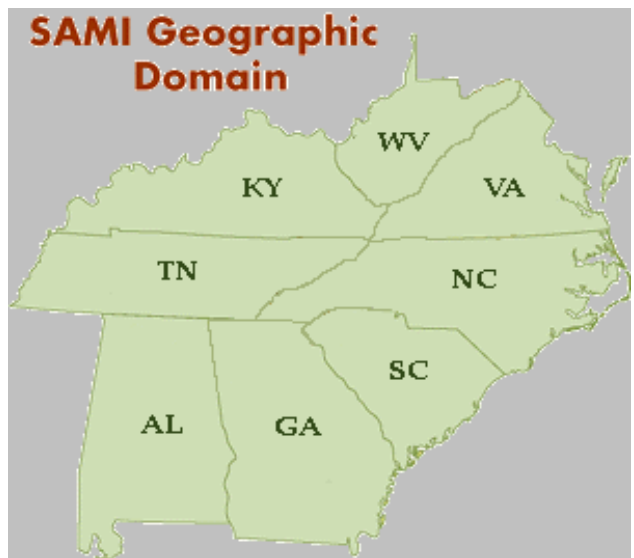
Policy Strategies: Serious Proposals or Wish List?

SAMI’s policy strategies range from basically accepting the status quo, which they refer to as the “On-the-Way” (OTW) strategy, to a proposal for a radical restructuring of air pollution policy, which is referred to as Beyond Bold (BB)¹. OTW would simply accept those policies currently in place and expected to be in place in the near future. BB would go far beyond OTW, imposing very stringent new controls on all forms of emissions from automobiles to power plants and manufacturers. The intermediate policy strategies are known as Bold With Constraints (BWC) and Bold (B).

In their final analysis SAMI will offer the four strategies as alternatives, presenting the costs and benefits of each. The mere fact that the strategies are being considered

and benefits from the strategies such as “statistical lives saved” are presented, will automatically make them part of the debate in the near-term and for years to come. It is also likely that SAMI’s analysis will be invoked not only with regards to their particular strategies but also in support of other legislation such as the Clean Smokestacks Bill under consideration by the N.C. General Assembly.²

The mere fact that these proposals and the analysis that accompany them will bear the imprimatur of the EPA, and other government agencies that are behind SAMI, will automatically give them standing in debates surrounding air pollution policy. But this doesn’t mean that the alternative strategies and the accompanying analysis do not carry a political agenda. Two of the four strategies mentioned above admittedly shun practical limitations and apparently represent the dreams of those SAMI members who would like to see a radical restructuring of the way Americans produce and consume energy. According to SAMI’s own definitions strategy B was developed “without consideration of implementation constraints,” and BB is “intended to approximate the outer limits of emissions reductions without consideration of economic or technical feasibility.”³ In light of this, a logical question might be why stop at BB? If SAMI is going to come up with proposals based on a never-never land conception of reality then why not consider a WBB strategy (Way Beyond Bold) where all emissions are eliminated? Wouldn’t this truly be “the outer limit of emissions reductions?” The reason is that such a policy would obviously be too absurd to be taken seriously. In reality, no proposals that fail to take into account “economic or technical feasibility” should be considered in a serious discussion of public policy.



SAMI’s “Socioeconomic” Analysis

In conjunction with issuing its policy strategies SAMI will also be considering the “socioeconomic implications” of each of the approaches to emissions reduction. According to documents published on SAMI’s web site this aspect of SAMI’s work will focus on the impact of their strategies on a wide range of issues related to human well-being. A partial list includes activities like fishing, hiking and enjoying scenery, and the positive and negative implications for people’s lifestyles.⁴ SAMI also points out that part of their analysis will focus on “competitiveness” where the strategies’ impact on economic variables such as business and consumer related costs, employment and employee earnings will all be evaluated.

A. MORTALITY

Probably the most controversial aspect of SAMI’s analysis will be any claims that are made regarding the numbers of lives that will be saved if one or another of its strategies were enacted, which is part of their stated mission. As noted in SAMI’s “2001 Interim Report” their analysis, “will examine changes in mortality risk from ambient concentrations of particulates under various emission reduction strategies.”⁵ It is likely that the media and the public will take any numbers that are released regarding lives saved by implementing the alternative strategies very seriously. Because of this their analysis should be very careful to consider all the relevant scientific literature and to avoid making controversial assumptions. This is particularly important because a good deal of media hype has focused on analysis of mortality rates associated with particulate matter (PM) that has been sponsored by left-wing advocacy groups.⁶ The claims of these “studies” have been hyperbolic and the analysis has been based on a reading of the scientific literature that biases the results in favor of the left wing environmentalist agenda. SAMI needs to separate itself from this agenda-driven analysis in order to preserve its scientific integrity.

• **Growth and Unemployment: Examining the Net Effects on Mortality** — There are two issues that SAMI needs to confront when conducting their analysis. First they will need to recognize that there will be both mortality benefits **and** mortality costs associated with their proposals. In other words, the fundamental question should be “what are the **net** mortality effects of each of the proposals?”

In recent years there has been an increasing amount of research in the area of what is known as “health-health” or “comparative risk” analysis. The thrust of this research is to recognize that regulations that are meant to reduce risk and mortality rates often have economic impacts that generate health risks and deaths of their own. For example, in a 1994 study published in *The Journal of Risk and Uncertainty* researchers concluded that poverty and reductions in GDP growth have mortality costs. Reduced levels of economic growth have a negative impact on health care, diets, living conditions, stress levels, etc. In particular, this study concluded that for each reduction of \$9 million in GDP one life is lost.⁷ Given that the SAMI strategies, particularly B and BB, will likely result in very large economic costs and therefore reductions in GDP growth in affected states, their mortality analysis would need to take into account any lives that are lost due this economic growth effect.

Along these same lines, an important 1991 study by Bernard Cohen in the journal *Health and Physics* concludes that being unemployed increases one's chance of death by 4 percent and decreases one's life expectancy by 1.4 years. As Cohen points out "This is roughly...equal to smoking 10 packs [of cigarettes] per day while unemployed."⁸ These conclusions are based on studies showing that people who are unemployed are more likely to have heart attacks and alcohol-related problems, and less likely to have health insurance. Unemployed people are also more likely to commit suicide or be a victim of homicide. The point is that if the costs of the SAMI strategies include significant job loss, which is likely, especially in energy and transportation related industries, then Cohen's analysis would need to be figured into their mortality assessments. Any mortality analysis that only looks at "lives saved" from the policies and does not factor in the lives lost would be meaningless as an aid in assessing the desirability of SAMI's proposed alternative strategies.

It should be pointed out that whenever SAMI is examining the health consequences of their alternative strategies, it is the net effects that are important. For example, if their study looks at the health consequences of ozone reduction it would need to include not only the health benefits that might accrue to those who have respiratory problems but it should also include the negative impact that ozone reduction would have on skin cancers and cataracts. Ozone is a sunscreen that protects people against the UV-B rays of the sun. The EPA has a history of ignoring these latter effects in their analysis and the courts have recently called them on this omission.⁹

• **The Linearity Assumption** — As noted, the mortality studies done by SAMI will likely be the most controversial aspect of their analysis. SAMI will be looking at the mortality effects of fine particles in the atmosphere that are less than 2.5 microns in diameter. These particles, called particulate matter 2.5 (PM2.5), are less than 1/100th the width of a human hair and are the result of a combination of several pollutants found in the atmosphere. What studies sponsored by environmental advocacy groups have done is to assume that there is no concentration of PM2.5 in the atmosphere below which people are safe.¹⁰ In other words, these studies have assumed that even natural background levels of PM2.5 are deadly. Furthermore, they have assumed that equivalent reductions in PM2.5 will yield the same number of "lives saved" when levels are very low as when they are very high. Scientists call this the "linearity assumption." More technically it assumes that there is a linear relationship between mortality and PM2.5 all the way down to zero amounts of it in the atmosphere.

But the linearity assumption is not justified. An often-cited study of the issue by the Health Effects Institute concludes: "The issue of concentration-response relationships deserve additional analysis."¹¹ Furthermore, a recent study conducted by two professors from UNC-Chapel Hill and two from N.C. State University concludes that "for fine particles, we found evidence of a threshold, most likely with values in the range of 20-25 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The proposed but not yet fully implemented EPA standard for PM2.5 is $15 \mu\text{g}/\text{m}^3$, well below the threshold. They also conclude, "considerations of non-linear effects can lead to real changes of interpretation."¹²

If this finding is correct, it is likely that SAMI's B and BB strategies would have no mortality benefits since these proposals would bring PM2.5 levels below even the EPA recommended levels. If SAMI's study assumes linearity without giving the issue "further study" as recommended by HEI and without refuting the analysis done by the North Carolina researchers it would call into question the scientific integrity of their entire analysis.

Furthermore, it should be pointed out that while some analysis has shown a statistical correlation between mortality rates and PM2.5, to date medical literature has not established an actual causal relationship between the two. This suggests that the deaths that are being observed may be being caused by something other than PM2.5. As concluded by the Health Effects Institute, "Whether any of these associations reflects toxicity of the pollutant per se...is as yet unclear. We should, therefore, be careful in our interpretations of the output of even the most carefully designed statistical models."¹³

Questions Legislators and Policymakers Should Ask

- Are the SAMI proposals under consideration realistic?
- Does SAMI's analysis consider all relevant aspects of the scientific literature?
- Does the socioeconomic analysis include all costs and benefits?
- Do mortality estimates consider both lives saved by the policy and lives lost?
- Does the analysis of other health effects, possibly from reductions in ozone, consider both the positive and negative health effects from the policy under consideration?
- Do mortality studies ignore possible threshold effects by assuming "linearity?"
- Is the economic analysis complete? Does it consider the total impact of the policy on all sectors of the economy and the effects on employment, GDP, and prices or does it focus on only a handful of industries that are directly effected?

B. ECONOMIC IMPACTS

The more extreme strategies being considered by SAMI will, if implemented, have a dramatic impact on the economy of the region. These policies would amount to imposing a tax on the use of energy of all kinds. Since energy is an input into all production processes and all consumption activities, everyone will feel the impact of these proposals, not just the industries that will be required to deal with the regulations directly. For example, while it is thought that utility companies that generate power with coal will feel the direct impact of the regulations, to the extent that these utilities increase their demand for alternative energy sources like natural gas the cost of these sources will increase. Therefore these regulations will increase the cost of all energy sources across the board. The effect will be to increase production costs in all industries, reducing GDP growth, with the consequent loss of jobs. Any economic analysis that focuses only on particular industries will be incomplete and misleading. SAMI's economic analysis needs to focus on economic variables for all sectors of the region's economy, including GDP growth, employment, and price effects.

The extent to which these impacts will occur depend on which strategies are considered. But it would be reasonable to assume that the economic impact of implementing the BB and possibly the B strategy would be at least as dramatic as those that would have occurred with the implementation of the Kyoto Protocol on global warming. This would also have been equivalent to a large across-the-board energy tax. According to the most extensive study done of the economic impacts of the Kyoto Protocol, the 8 SAMI states would have had employment reductions averaging 2.26 percent by the year 2010. Given the size of the labor force in the SAMI region as of 2001 this would imply a loss of over 465,000 jobs.¹⁴ Given that it was devised without any consideration of economic feasibility, it is possible that SAMI's BB strategy could have an even greater impact on employment than the Kyoto Protocol.

Conclusion

For the past decade, the state of North Carolina has joined seven other Southeastern states and several agencies of the federal government to study the issue of air quality in the Southern Appalachian Mountain region. Until now this work, under the organizational name of the Southern Appalachian Mountain Initiative, has been going on in relative obscurity. But this is about to change. SAMI will soon publish its strategies for public policy and governors of the states will be asked to make recommendations to their respective state legislatures.

It is hoped that SAMI's analysis of alternative strategies will avoid political agendas and ideology and be attentive to sound science and economics. Several of their alternative strategies, particularly Bold and Beyond Bold, are radical in nature and by their own admission discard the actual technical feasibility of carrying them out. The fact that SAMI is considering such strategies in the first place does not bode well for the integrity of the science or economics of the analysis that will accompany the presentation of their alternatives. Lawmakers not only in North Carolina but throughout the region need to consider this and independently examine SAMI's assessments before diving into any of the alternatives that might be proposed.

— Dr. Roy Cordato, Vice President for Research

Notes

¹ There is a fifth "strategy" which is used as a benchmark in their analysis called "On the Books" (OTB). This refers to laws and regulations that are already in place.

² This is already taking place. See, Julie Ball, "Study: NC pollution is home-grown," *The (Asheville) Citizen Times*, Jan. 10, 2002.

³ 2001 *Interim Report*, Southern Appalachian Mountain Initiative, May 2001, p.3.

⁴ *Ibid.* p.18.

⁵ *Ibid.*

⁶ The classic example if this is "Death, Disease, and Dirty Power" commissioned and published by the Clean Air Task Force and found at www.clnatf.org/resources/reports/index.html.

⁷ Randall Lutter and John F. Morrall, "Health-Health Analysis: A New Way to Evaluate Health and Safety Regulation," *Journal of Risk and Uncertainty*, Vol. 8, 1994, p. 58.

⁸ Bernard L. Cohen, "Catalog of Risks Extended and Updated," *Health and Physics*, Vol. 61, No. 3, September, 1991, p.321.

⁹ See Randall Lutter and Howard Gruenspecht, "Assessing Benefits of Ground-Level Ozone: What Role for Science in Setting National Air Quality Standards?" AEI-Brookings Joint Center for Regulatory Studies, *Regulatory Analysis* 01-04, May, 2001.

¹⁰ *Op. cit.* at note 6.

¹¹ "Statement: Synopsis of the Particle Epidemiology Reanalysis Project," The Health Effects Institute, p. 3. Found at www.healtheffects.org/Pubs/st-reanalysis.htm.

¹² Richard Smith, Dan Spitzner, Yuntae Kim, and Montserrat Fuentes, "Threshold Dependence or Mortality Effects for Fine and Course Particles in Phoenix, Arizona," *The Journal of Air and Waste Management*, August, 2000, p.1.

¹³ "Airborne Particles and Health: HEI Epidemiology Evidence" in *HEI Perspectives*, June, 2001.

¹⁴ "The Impact of Carbon Mitigation Strategies on State Economies," DRI/McGraw-Hill, August, 1997.