



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Office of Air and Radiation

March 23, 2011

MEMORANDUM

SUBJECT: Review of the draft *Report to Congress on Black Carbon*

FROM: Steve Page, Director
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TO: Vanessa Vu, Director
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This memorandum provides background information and specific charge questions to the Black Carbon Review Panel of the Advisory Council on Clean Air Compliance Analysis in its review of a draft report on black carbon prepared by EPA's Office of Air and Radiation (OAR) and Office of Research and Development (ORD). This report was developed at the request of the United States Congress, as outlined in *H.R. 2996. Department of the Interior, Environment, and Related Agencies Appropriations Act, 2010*. The draft report summarizes available scientific information regarding the impacts of black carbon on climate and public health, and evaluates the effectiveness of available mitigation approaches and technologies for reducing black carbon emissions. This document will be the focus of a review by the Black Carbon Review Panel (Panel) on April 18-19, 2011

Background

The attached draft document, *Report to Congress on Black Carbon. External Peer Review Draft* (Report), serves primarily as a review and synthesis of available scientific and technical information on black carbon. This information includes published studies, emissions inventories, and observational data records. In developing the Report, EPA has focused on addressing key elements of the congressional charge, which stated that:

"Not later than 18 months after the date of enactment of this Act, the Administrator, in consultation with other Federal agencies, shall carry out and submit to Congress the results of a study on domestic and international black carbon emissions that shall include

- *an inventory of the major sources of black carbon,*
- *an assessment of the impacts of black carbon on global and regional climate,*

- *an assessment of potential metrics and approaches for quantifying the climatic effects of black carbon emissions (including its radiative forcing and warming effects) and comparing those effects to the effects of carbon dioxide and other greenhouse gases,*
- *an identification of the most cost-effective approaches to reduce black carbon emissions, and*
- *an analysis of the climatic effects and other environmental and public health benefits of those approaches.”*

To address these requirements, EPA has developed a Report that covers the following topics:

1. Definitions of black carbon, and mechanisms by which it affects climate
2. Net effect of black carbon on global and regional temperature change, in terms of both magnitude and time scale
3. Effects of black carbon on snow and ice; precipitation; and surface dimming
4. Contribution of black carbon to human health impacts associated with exposure to fine particles, and other, non-climate environmental impacts
5. Extent of observational data record for black carbon based on monitoring networks, ice cores, and other observational research
6. Current U.S. and international emissions of black carbon, key emitting sectors, and projected changes in future emissions globally
7. Technologies and approaches available to reduce emissions from key sectors, and costs
8. Potential for black carbon emissions reductions to benefit climate and public health

The Report is organized into twelve chapters and six technical appendices that address these topics. The Report focuses on synthesizing available scientific information about black carbon from peer-reviewed studies and other technical assessments, describing current and future emissions estimates, and summarizing information on available mitigation technologies and approaches, including their costs and relative effectiveness. This Report also describes remaining uncertainties and identifies research and technical information needed to fill gaps in the current body of scientific evidence.

Document Availability

The draft Report is being made available to the Panel in the form of the attached electronic file, which we request that you forward to members of the Panel. Printed copies of this document are being sent today, March 23, 2011, to members of the Panel via UPS.

Specific Charge in Reviewing the draft *Report to Congress on Black Carbon*

We ask the Panel to focus on the charge questions below in their review of the draft Report, but we would appreciate comments on any other topics as well.

General Questions for All Chapters

- 1 In the Panel’s view, does the draft Report accurately interpret and clearly communicate the findings of the current scientific and technical literature, including important uncertainties, pertaining to black carbon (BC)? Based on this literature, what are the

Panel's views on the preliminary conclusions as summarized in the Executive Summary and in the key messages for each chapter?

2. Is the Panel aware of any additional, policy-relevant studies that should be included in the draft Report to inform the preliminary conclusions? Are there specific studies that should be given more or less emphasis?

Additional Questions for Specific Chapters

Chapter 2: Black Carbon Effects on Climate

3. Does the draft Report accurately identify and characterize light-absorbing carbonaceous particles, including BC and brown carbon?
4. Does the draft Report adequately explain and appropriately characterize the differences between BC and long-lived greenhouse gases such as CO₂?
5. Does the draft Report appropriately characterize the mechanisms by which BC affects climate and the full range of climate effects of BC (including best available estimates of the magnitude of those effects)?

Chapter 3. Black Carbon Effects on Public Health and the Environment

6. Does the draft Report accurately summarize and interpret the body of scientific evidence relating to the potential public health effects of BC?
7. Does the draft Report accurately summarize and interpret the body of scientific evidence with regard to potential non-climate environmental (welfare) effects of BC?

Chapter 4: Emissions of Black Carbon

8. Does the draft Report appropriately characterize available information on historical, current and future emissions of BC and related compounds in the United States and globally, and present this information clearly?
9. Does the draft Report accurately summarize and interpret currently available information regarding the transport of BC emissions downwind of sources and the relationship between the location of emissions sources and the geographic region of climate and non-climate impacts?

Chapter 5 Observational Data for Black Carbon

10. Does the draft Report appropriately characterize and interpret the information on BC that is available from the observational record?

Chapters 6-10: Mitigation Approaches to Reduce Black Carbon Emissions

11. Does the draft Report accurately reflect and clearly communicate information on the available technologies, control strategies, and costs of reducing BC emissions in various sectors? Are there additional control technologies or mitigation strategies for specific sources or sectors that have significant potential to reduce U.S. or global BC emissions that should be included in the Report?

12. Can the Panel suggest other reliable sources of information on the costs of reducing BC emissions, particularly for international sources, that should be considered in the Report?
13. Does the draft Report appropriately characterize the range and magnitude of potential benefits for both climate and public health that could result from reductions in BC emissions?

Chapter 11 Metrics for Comparing Black Carbon Impacts to Impacts of Other Climate Forcers

14. Does the draft Report accurately describe the range and limitations of metrics available to quantify and/or communicate the climate effects of BC, to compare BC with long-lived greenhouse gases such as CO₂, and to compare among BC mitigation alternatives?

Chapter 12. Conclusions and Research Recommendations

15. Does the draft Report appropriately identify the highest priority research needs regarding BC?

Technical Appendices

16. Do the technical appendices to the draft Report contain any information that should be included in the main body of the Report?