

Executive Summary – Bay Area 2010 Clean Air Plan

Purpose of the CAP

The Bay Area 2010 Clean Air Plan (CAP) provides a comprehensive plan to improve Bay Area air quality and protect public health. The 2010 CAP has been prepared in close collaboration with the Air District's regional agency partners, and has been informed by extensive outreach to the public and interested stakeholders.

The CAP defines a control strategy that the Air District and its partners will implement to: (1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and (3) reduce greenhouse gas (GHG) emissions to protect the climate.

The legal impetus for the CAP is to update the most recent ozone plan, the Bay Area 2005 Ozone Strategy, to comply with state air quality planning requirements as codified in the California Health & Safety Code. Although we have made steady progress in reducing ozone levels in the Bay Area, the region is designated as non-attainment for both the one-hour and eight-hour state ozone standards. In addition, emissions of ozone precursors in the Bay Area contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the CAP to include all feasible measures to reduce emissions of ozone precursors and to reduce transport of ozone precursors to neighboring air basins.

The Bay Area was recently designated as non-attainment for the national 24-hour fine particulate matter (PM_{2.5}) standard, and will be required to prepare a PM_{2.5} State Implementation Plan (SIP) pursuant to federal air quality guidelines by December 2012. The 2010 CAP is not a SIP document and does not respond to federal requirements for PM_{2.5} or ozone planning. However, in anticipation of future PM_{2.5} planning requirements, the CAP control strategy also aims to reduce PM emissions and concentrations. In addition, U.S. EPA is currently reevaluating national ozone standards, and is likely to tighten those standards in the near future. The control measures in the CAP will also help in the Bay Area's continuing effort to attain national ozone standards.

A Multi-Pollutant Plan

In addition to updating the Bay Area's state ozone plan, the 2010 CAP will also serve as a multi-pollutant plan to protect public health and the climate. This effort to develop its first-ever multi-pollutant air quality plan is a voluntary initiative by the Air District. The Air District believes that an integrated and comprehensive approach to planning is

critical to respond to air quality and climate protection challenges in the years ahead. In its dual roles as an update to our state ozone plan and a multi-pollutant plan, the 2010 CAP addresses four categories of pollutants:

- Ground-level ozone and its key precursors, ROG and NO_x;
- Particulate matter: primary PM_{2.5}, as well as precursors to secondary PM_{2.5};
- Air toxics; and
- Greenhouse gases.

The major purpose for developing a multi-pollutant plan is to achieve the greatest possible public health benefit by reducing emissions, ambient concentrations, and public exposure across the four categories of air pollutants addressed in the 2010 CAP. In developing the CAP control strategy, the Air District has attempted to maximize co-benefits, while at the same time minimizing any potential trade-offs among pollutants.

Evaluating control measures on the basis of their potential to reduce multiple pollutants is complex, and little guidance or precedent is currently available. To address this issue, the Air District developed a Multi-Pollutant Evaluation Method (MPEM) which integrates the three core goals of the 2010 CAP: improving air quality, protecting public health, and protecting our climate. The MPEM analyzes how a given reduction (or increase) in emissions of each pollutant will affect ambient concentrations, population exposure, and health effects related to that pollutant. The MPEM then aggregates the impacts of each control measure on a multi-pollutant basis. Finally, the MPEM monetizes the value of the health and climate protection benefits for each control measure and expresses these benefits in dollar terms, in order to facilitate comparison of the relative benefit of the various control measures.

CAP Control Strategy

The proposed 2010 CAP control strategy builds on a solid foundation established by the 2005 Ozone Strategy, and previous ozone plans prepared in the 1991 to 2005 period. But the 2010 CAP also moves in new directions to address emerging challenges and opportunities. The 2010 CAP control strategy includes revised, updated, and new measures in the three traditional control measure categories: Stationary Source Measures, Mobile Source Measures, and Transportation Control Measures. In addition, the CAP identifies two new categories of control measures: Land Use and Local Impact Measures, and Energy and Climate Measures.

The draft control strategy proposes a total of 55 control measures, including:

- 18 Stationary Source Measures;
- 10 Mobile Source Measures;
- 17 Transportation Control Measures;
- 6 Land Use and Local Impact Measures; and
- 4 Energy and Climate Measures.

The 2010 CAP also describes 18 Further Study Measures, which will be further evaluated as potential control measures. In addition, the CAP includes a Leadership Platform. The Leadership Platform is intended to complement the control strategy by identifying policies and actions, such as legislation or adoption of regulations by other agencies, which will support or enhance the control measures identified in the CAP.

In sum, the Bay Area 2010 CAP provides a control strategy designed to:

- reduce emissions of ozone precursors, PM, air toxics, and greenhouse gases;
- continue progress toward attainment of state ozone standards;
- reduce transport of ozone precursors to neighboring air basins;
- protect public health by reducing population exposure to the most harmful air pollutants; and
- protect the climate.

Key Findings

In preparing the 2010 CAP, Air District staff analyzed air pollutant trends and the health risks associated with past levels and current levels of air pollution. Key findings of this analysis for the Bay Area can be summarized as follows:

- Bay Area air quality has improved significantly in recent decades. Ambient concentrations of - and population exposure to - harmful air pollutants, including ozone, PM, and air toxics, have all been greatly reduced.
- The improvement in air quality in recent decades has greatly reduced health effects related to air pollution.
- Premature deaths related to air pollution have declined by several thousand per year, from approximately 6,400 per year in the late 1980's to approximately 2,800 per year in 2008.
- The estimated lifetime cancer risk (over a 70-year lifespan) from all toxic air contaminants combined declined by 70 percent between 1990 and 2008, from approximately 1,330 cases per million people to approximately 405 cases per million.
- The improvement in air quality has extended average life expectancy in the Bay Area by approximately 6 months over the past two decades.
- In economic terms, the public health dividend of the improvement in air quality provides billions of dollars in benefits to the Bay Area each year.

Despite this progress, air pollution still has negative health impacts for many Bay Area residents. These effects include acute and chronic respiratory problems, asthma, cardiovascular effects, and premature mortality.

- Exposure to PM_{2.5} is by far the leading public health risk from air pollution in the Bay Area, accounting for more than 90% of premature mortality related to air pollution.
- Implementation of the proposed control measures in the 2010 CAP should result in approximately 85 fewer premature deaths per year in the Bay Area.
- Implementation of the proposed control measures in the 2010 CAP will, collectively, provide benefits with a monetary value in the range of \$270 million to \$1.5 billion per year, with a likely value on the order of \$770 million per year, in terms of reduced medical costs, increased life expectancy, and reduced impacts of climate change.
- Roughly 80% of the estimated economic benefits from the CAP control measures can be attributed to reductions in PM_{2.5} (66% non-diesel PM_{2.5} and 14% diesel PM_{2.5}). Reductions in greenhouse gases account for approximately 20% of the economic benefits.
- Although emissions and ambient concentrations of criteria pollutants and air toxics have been declining in the Bay Area, emissions and concentrations of greenhouse gases have been increasing in the Bay Area and elsewhere.
- Climate change due to increased emissions and concentrations of greenhouse gases is expected to result in an increase in the number of high heat days and wildfires in the Bay Area and adjacent areas. These impacts are likely to exacerbate air pollution and complicate efforts to attain air quality standards for ozone and PM.
- The control measures in the CAP will reduce emissions of greenhouse gases. Some CAP measures will directly reduce GHG emissions; many other measures will provide GHG reductions as a co-benefit.
- To provide a comprehensive plan that addresses multiple pollutants and protects public health and the climate, new types of control measures, such as the Land Use and Local Impact Measures and the Energy and Climate Measures, have been incorporated in the 2010 CAP control strategy.

Looking Forward

The 2010 CAP moves the Bay Area toward a new approach to air quality planning. The key goals defined in the CAP are to protect air quality, public health, and the climate. Despite impressive progress in improving Bay Area air quality in recent decades, we face significant challenges as we strive to achieve these goals in the future. The challenges include tighter air quality standards, limited resources, the dearth of new “low-hanging fruit” in terms of emissions control programs, future economic and population growth in the region, and the potential impacts of climate change and higher temperatures on air quality.

Under these circumstances, the multi-pollutant framework can provide a means to evaluate and balance competing objectives, maximize co-benefits from control strategies, improve the cost-effectiveness of programs to reduce emissions of criteria pollutants and greenhouse gases, and optimize the use of limited resources by the Air District, its partner agencies, and the regulated community.

Looking forward, the Air District will continue its efforts to achieve the CAP goals and to build its multi-pollutant planning capacity by:

- Developing an integrated emissions inventory that includes all pollutants;
- Developing an integrated air quality modeling platform;
- Enhancing the Multi-Pollutant Evaluation Method developed for the 2010 CAP to include a wider range of pollutants and health effects;
- Enhancing its capacities to measure and analyze ambient concentrations and population exposure in impacted communities;
- Developing better measurements of population exposure to pollutants on a region-wide basis;
- Evaluating the potential benefits, and considering the policy and technical issues, related to extending the risk-weighted multi-pollutant approach to programs such as stationary source permitting and New Source Review; and
- Better integrating strategies to reduce criteria pollutants and greenhouse gases.

The Air District elected to develop the 2010 CAP as a multi-pollutant plan as a matter of choice. However, future challenges are likely to make multi-pollutant planning a necessity in years to come. In addition to serving as a blueprint for the Bay Area, the Air District offers the 2010 CAP as an example of a multi-pollutant plan that other agencies can build upon to advance this concept.