United States
Environmental Protection
Agency

Research and Development

Air and Energy Engineering
Research Laboratory
Research Triangle Park, NC 27711

EPA/600/SR-93/173 March 1994

EPA

Project Summary

RFP Tracking System: User's Manual

Charles C. Monroe, T. Allan Dean, and William R. Barnard

The Clean Air Act Amendments (CAAA) of 1990 called for Reasonable Further Progress (RFP) inventories to be submitted to EPA to demonstrate strategies by which a 15% reduction in volatile organic compound emissions will be achieved over the years 1990 to 1996. This requirement applies to moderate, serious, severe, and extreme ozone nonattainment areas. In addition, serious, severe, and extreme areas must demonstrate at least a 3% annual average reduction beginning in 1996 and continuing thereafter until attainment is reached. In order to track the emission reductions resulting from these strategies, emissions reported in the RFP projection inventories will be compared with actual emissions reported in periodic adjusted-base inventories, which are also required by the CAAA. However, this comparison will take place a number of years in the future. Therefore, an early warning system capable of independently forecasting emissions is required to enable EPA management and technical staff to track progress toward the 15% emission reduction goal mandated by the CAAA. This report describes the operating characteristics of a personal-computer-based RFP tracking system developed for use by EPA in evaluating the progress that nonattainment areas are making toward meeting the 15% reduction specified in the CAAA. Details on the program's capabilities, file handling, reporting, and graphics are reported.

This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

Section 182(b)(1) of the 1990 Clean Air Act Amendments (CAAA) requires all ozone nonattainment areas classified as moderate and above to submit a state implementation plan (SIP) revision by November 15, 1993, which describes, in part, how the areas will achieve an actual volatile organic compounds (VOC) emissions reduction of at least 15% within the first 6 years after enactment of the CAAA (i.e., the SIP revisions are due by November 15, 1996). Emissions and emissions reductions will be calculated on an average daily basis for the peak 3-month ozone period (generally June through August). The 15% VOC emissions reduction required by November 15, 1996, is defined as "rate of progress." Furthermore, the portion of the SIP revision that illustrates the plan for achieving this emissions reduction is defined as the "Rate of Progress Plan." Additionally, states with moderate ozone nonattainment areas confined within their state boundaries will generally be required to submit attainment demonstrations with their SIP revisions due by November 15, 1993. If these areas choose to use the Urban Airshed Model (UAM) to prepare their attainment demonstrations, they will be allowed to submit attainment demonstrations by November 15, 1994. It is important to note that section 182(b)(1)

also requires the SIP for moderate areas to provide for reductions in VOC and nitrogen oxide (NO_x) emissions "as necessary to attain the national primary ambient air quality standard for ozone" by November 15, 1996. This requirement can be met by using EPA-approved modeling techniques and by adopting any additional control measures beyond those needed to meet the 15% emission reduction requirements. Any attainment demonstration submitted as part of the SIP revision process is designed to demonstrate attainment of the National Ambient Air Quality Standards (NAAQS) for ozone.

In addition to the 15% emission reduction mentioned above that applies to moderate-and-above ozone nonattainment areas, Section 182(c)(2) also requires all ozone nonattainment areas classified as serious and above to submit a SIP revision by November 15, 1994, which describes, in part, how each area will achieve additional VOC emission reductions of 3% per year averaged over consecutive 3-year periods from November 15, 1996, until the areas are redesignated attainment. These additional VOC emissions reductions are defined in the CAAA as "reasonable further progress" (RFP) reductions: this term is used in this paper as well. It is important to note that Section 182(c)(2)(C) allows for actual NO_x emissions reductions (exceeding growth) since the base year of 1990 to be used to meet post-1996 emissions reduction requirements for ozone nonattainment areas classified as serious and above if such NO_x reductions meet the criteria set forth in forthcoming substitution guidance. The portion of the SIP revision (due in 1994) that illustrates the plan for the achievement of these further reductions has been defined as the "Post-1996 Rate of Progress Plan." This plan must also contain an attainment demonstration based on photochemical grid modeling.

Demonstrating achievement of the 15% VOC emissions reductions by November 15, 1996, and then subsequently demonstrating achievement of 3% VOC emissions reductions per year averaged over consecutive 3-year periods from November 15, 1996, are termed milestone demonstrations. Achievement of the milestones must be demonstrated within 90 days of the milestone date (i.e., the 15% VOC emissions reductions must be demonstrated by February 13, 1997). Rules regarding the development of the milestone demonstrations will be promulgated in summer 1993 and will address the timing problem of developing a full emissions inventory to meet the milestone demonstration requirement.

Once the milestone demonstrations are submitted, EPA has 90 days to determine if the milestone demonstration is adequate. To help determine the adequacy of the milestone demonstration and to aid in tracking progress that these nonattainment areas are making toward reaching their emission reduction goals, EPA has developed a personal-computer-based tracking system to be used to evaluate RFP. This report provides details on the program's capabilities, including file handling, reporting, graphics, and the algorithm used to project emissions. The system described here is designed to track the 3% per year reductions required of serious-and-above nonattainment areas.

System Capabilities

The RFP Tracking System was designed to facilitate the projection of future emissions of ozone precursors, specifically VOC, but the system can also track emissions of carbon monoxide (CO) and NO_x for a variety of geographic areas. The system is designed to give EPA managers the ability to track RFP in emission reductions for these pollutants. Given a reasonable set of input data, the program provides EPA personnel with an early warning of an expected future failure of a nonattainment area to meet RFP requirements, as specified in the CAAA.

The RFP Tracking System was developed using Superbase 4, a Microsoft Windows database package that can be compiled and distributed as a stand-alone product. As a Windows product, it requires Windows in order to run. Additionally, a computer with a 386SX or better microprocessor and 4 Mb of random access memory (RAM) is suggested as the platform on which to run the program. This is the minimum configuration typically recommended for running Windows. Because the system was developed using a Windows-based product, it has been configured to run entirely using a mouse to point and click on various buttons to perform particular commands or functions. However, all functions can also be accessed via the keyboard. The environment is entirely object-oriented and event-driven. This point-and-click simplicity was intended in order to keep the system as user friendly as possible and because the intended user would probably be a novice.

An advantage of developing the system using a Windows-based product is that certain tasks can be performed in the "background," since Windows offers the capability to perform multitasking operations when running on a 386SX or better platform. Thus, when the system is performing disk-intensive or processor-intensive tasks (such as file imports or emission projection calculations), the program can be minimized to an icon, and the user can work on documents in a word processor or on a spreadsheet until the task is complete. The system is designed to beep when these tasks are complete, and the icon's title will indicate that the task is complete. At that point, the user can return to the program and continue the analysis.

The system can project emissions out to the year 2010 at intervals of 1, 3, and 5 years. In addition to projecting emissions, the system can make projections in the form of percent reduction relative to base year emissions. The system is designed to accept input data from either the Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS) or the Area and Mobile Source Subsystem (AMS). Output from the system is in the form of tables or graphs, which can be directed to the computer screen or to a printer. Tabular results can also be output to an ASCII file, allowing the user to subsequently import the reported information into other software for further analysis (either numeric or graphic). Data contained in the output file can also be exported to Lotus 123, dBaseIII, or Excel.

☆U.S. GOVERNMENT PRINTING OFFICE: 1994 - 550-067/80202

C. Monroe, A. Dean, and W. Barnard are with E. H. Pechan and Associates, Durham, NC 27702.
***E. Sue Kimbrough** is the EPA Project Officer (see below).*
The complete report consists of one paper copy, entitled "RFP Tracking System: User's Manual," and four diskettes. Obtain the manual by itself by requesting Order No. PB94-104650, Cost: $19.50. Obtain the complete set by requesting Order No. PB94-500204, Cost: $90.00. Both costs are subject to change.
The report and diskettes will be available only from
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Telephone: 703-487-4650
The EPA Project Officer can be contacted at
Air and Energy Engineering Research Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

United States
Environmental Protection Agency
Center for Environmental Research Information
Cincinnati, OH 45268

Official Business
Penalty for Private Use
$300

EPA/600/SR-93/173

BULK RATE
POSTAGE & FEES PAID
EPA
PERMIT No. G-35