Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans

Appendix H: Weight of Evidence Pathway

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SECTION H.1: BASICS OF WEIGHT OF EVIDENCE

Pathway Description

A weight of evidence determination (WOE) that accompanies air quality modeling results draws from a variety of analyses – including the primary attainment test – to make a conclusion about whether an area will reach attainment of a National Ambient Air Quality Standard (NAAQS) by the appropriate year.[1] Supplemental analyses of air quality, emissions and meteorological data, and outputs from additional modeling runs may be used in a WOE determination to show whether attainment is likely. The level of detail required in a WOE submittal will vary depending on the strengths and weaknesses of the models used (e.g., model performance, degree of residual nonattainment in the modeled attainment test, amount of uncertainty in the model and its inputs, etc.). WOE demonstrations are generally described in guidance the U.S. Environmental Protection Agency (EPA) has issued on their use in State Implementation Plan (SIP) attainment demonstrations.[2]

Task Checklist: Weight-of-Evidence Pathway

- ✓ Identify and describe the EE/RE policies and programs that it wishes to include in the WOE demonstration
- ✓ Ensure EE/RE policies and programs will be in place for the duration of the planning period
- ✓ Perform an objective analysis of the benefits expected from the policies and programs
- ✓ Ensure that any EE/RE emission reductions included in the WOE demonstration are not double counted as part of another pathway

Tradeoffs of Pathway

State, tribal and local agencies can, of course, select more than one pathway for their jurisdiction's different EE/RE policies and programs. Out of the four pathways, documentation requirements for this pathway can vary the most depending on how rigorous an analysis the state, tribal or local agency performs to support the WOE determination. For example, if the primary test for attainment shows an area is close to meeting a NAAQS, a WOE determination based on a qualitative analysis may be compelling. If the primary test shows an area is not close to meeting a NAAQS, it is far less likely that qualitative arguments would be sufficient to support a WOE determination that the NAAQS will be attained. In these instances, a quantitative analysis is likely to be more compelling.

Unlike the control strategy and emerging/voluntary measures pathways, the WOE pathway does not offer SIP/Tribal Implementation Plan (TIP) credit. In addition, unlike the control strategy pathway, the WOE pathway does not include federal enforceability for the measures included in the WOE demonstration.

[1] Air quality modeling to show attainment of the NAAQS (and accompanying WOE demonstrations) primarily applies to nonattainment areas for which modeling is needed, or desired. However, air quality modeling can be performed in maintenance areas or to support other rules or sections of the Clean Air Act.
[2] EPA (2007).

Circumstances the Pathway is Best Suited For

State, tribal and local agencies can, of course, select more than one pathway for their jurisdiction's different EE/RE policies and programs. The WOE pathway is applicable where a state, tribal, or local agency has prepared an attainment demonstration based on modeling that results in projected future air quality that is close to the NAAQS. In this case, an agency may choose to submit a WOE determination, which may be based on, among other things, alternative modeling results, emissions controls that were not modeled, and ambient data trends and analyses. As part of the WOE determination, the agency may wish to take advantage of EE/RE policies/programs adopted in its jurisdiction for purposes other than the SIP/TIP. They may want to reflect the emission benefits of EE/RE policies/programs in the WOE determination because they believe that these programs are likely to improve air quality in the attainment year, but modeling the impact of the policy/program is either too resource intensive or not feasible for other reasons and/or the jurisdiction is not interested in SIP/TIP credit.

SECTION H.2: DOCUMENTATION AND ANALYSIS

Weight of evidence demonstrations are generally a set of analyses of air quality, emissions, meteorological data and modeling data that state, tribal and local agencies can use as supporting evidence to show that attainment of a NAAQS is likely. State, tribal and local agencies should weigh each type of analysis according to its credibility, as well as its ability to address the question being posed (i.e., whether the strategy is adequate for meeting the NAAQS by a defined deadline). The conclusions will help make an overall assessment of whether meeting the air quality goal is likely. The last step is a qualitative one. If the jurisdiction concludes that a strategy is inadequate to demonstrate attainment, a new strategy is selected for review, and the process is repeated. State, tribal and local agencies should provide a written rationale documenting how and why the conclusion is reached regarding the adequacy of the final selected strategy. Results obtained with air quality models are an essential part of a WOE determination and should ordinarily be very influential in deciding whether the NAAQS will be met. The EPA's guidance includes guidelines for assessing when corroborating analyses and/or WOE determinations may be appropriate.[3]

Documentation

EE/RE policies and programs that are included in a WOE determination to show attainment of a NAAQS is likely despite inconclusive air quality modeling should reference the policies and programs adopted for purposes other than the SIP that will be in place by the area's attainment date. During public review of the SIP, it must be clear what analyses were included in the WOE determination, including the additional state and local policies and programs whose benefits were reflected therein. A typical WOE determination would describe the impact from these EE/RE policies and programs and point out that they were not factored into the nonattainment area's modeling analysis; had they been, the results would have been more likely to show the area could meet the relevant NAAQS by its attainment date. The WOE determination should include the following:

[3] EPA (2007).

- A description of the EE/RE policies and programs reflected in the WOE determination.
- A statement that the benefits of the EE/RE policy/program will occur in the attainment planning timeframe for the nonattainment area in question.
- A statement that any emission reductions expected from the EE/RE policies/programs are not being double counted. (Avoiding double counting means that the emission reductions accounted for in the WOE demonstration are not incorporated in any of the other pathways.)

Each WOE determination will be subject to area-specific conditions and data availability. Area-specific factors may also affect the types of analyses that are feasible for a nonattainment area, as well as the significance of each analysis. Thus, those making the WOE determination need to make decisions about which analyses to perform and how much weight to place on each analysis on a case-by-case basis. EPA encourages state, tribal and local agencies to consult their EPA regional office before doing supplemental analyses to determine which analyses may be most appropriate for a particular area.

Objective Analysis of EE/RE Policy and/or Program Impacts

WOE demonstrations can include qualitative or quantitative analysis. If a state, tribal or local agency chooses to include a quantitative analysis they can refer to Appendix I for emission quantification approaches for EE/RE policies and programs.

State, tribal and local agencies need to perform an objective analysis of the air quality impacts expected from the EE/RE policies and programs reflected in the WOE demonstration. If the state, tribal or local agency chooses to quantify emission reductions, EPA has four approaches described in Appendix I that are available to help:

- Dispatch or Capacity Expansion Model Approach
- Historical Hourly Emission Rate Approach
- Capacity Factor Approach
- The eGRID Subregion Emission Rates Approach

In addition, EPA is providing energy savings estimates for state-mandated EE policies that could be used in a WOE demonstration (see Appendix J). For example, if the policies included in EPA's analysis are reflected in the WOE demonstration, then the estimate of energy savings could be used to estimate expected emission reductions from those policies. Generally, the more robust the analysis supporting the demonstration, then the stronger the case is that the nonattainment area will attain the NAAQS.

Strengthening the WOE Analysis

State, tribal and local agencies can strengthen the WOE analysis by providing a quantitative estimate of emission reductions resulting from EE/RE policies and programs. State, tribal and local agencies can carry out two tasks when including quantitative analyses:

- Estimate the energy savings that an EE policy will produce, or for an RE policy, the amount of energy generation that will occur and that will displace fossil fuel-fired generation. (Appendix I discusses approaches for accomplishing this task.)
- Quantify displaced electric generating unit emissions from energy impacts of an EE policy or RE policy using one of the four approaches described in Appendix I or other comparable techniques. Using the most rigorous emission quantification approach will strengthen the WOE analysis.
    - For example, including an analysis of whether the EE/RE policies and programs incorporated in the WOE demonstration are likely to result in emission reductions that will improve air quality in the area at the times of day and year when the area experiences air quality problems.

State, tribal and local agencies can also strengthen the WOE demonstration by obtaining commitments from state energy offices and/or public utility commissions to help achieve expected emission reductions. These state offices typically administer state EE/RE policies and programs. Making sure these offices understand that the emission reductions from EE/RE policies and programs are in the WOE demonstration and that they commit to helping achieve them should help ensure that the reductions occur.

REFERENCES

EPA (2007). *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze*. April 2007. Available online at <http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rh-guidance.pdf>

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