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

## Appendix C: Existing EPA Energy Efficiency/Renewable Energy Guidance

EPA-456/D-12-001d
July 2012

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

## Appendix C: Existing EPA Energy Efficiency/Renewable Energy Guidance

By:
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, North Carolina

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, North Carolina

# ACKNOWLEDGMENTS

We would like to acknowledge substantial contributions from members of an inter-office EPA team that included the Office of Atmospheric Programs, the Office of Policy Analysis and Review, the Office of General Counsel and Regions 1 and 6. This document also reflects comments received from a number of stakeholders, including state and local air quality agencies.

# Contents

## SECTION C.1: INTRODUCTION

This appendix provides brief information on existing U.S. Environmental Protection Agency (EPA) guidance that relates to energy efficiency/renewable energy (EE/RE) and state implementation plans (SIPs). It is organized by pathway. The EPA has issued five guidance documents related to incorporating EE/RE programs in SIPs:

- Guidance on State Implementation Plan (SIP) Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures, http://www.epa.gov/ttn/oarpg/t1/memoranda/ereseerem_gd.pdf, August 2004 *(referred to in this appendix as EE/RE Measures Guidance).*
- Guidance on Incorporating Emerging and Voluntary Measures in a State Implementation Plan (SIP), http://dnr.mo.gov/env/apcp/sipworkgrp/control_strategy_wrkgrp/VoluntaryControlMeasuresPolicyEPA.pdf, September 2004 *(referred to in this appendix as Emerging/Voluntary Measures Guidance)*.
- Guidance on Incorporating Bundled Measures in a State Implementation Plan, http://www.epa.gov/ttn/oarpg/t1/memoranda/10885guideibminsip.pdf, August 2005 *(referred to in this appendix as the Bundled Measures Guidance)*.
- Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze, http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf, April 2007 *(referred to in this appendix as the Modeling Guidance)*.
- Guidance on Emission Projections, Volume X, (http://www.epa.gov/ttnchie1/eiip/techreport/volume10/x01.pdf, 1999 *(referred to in this appendix as Emissions Projection Guidance)*.

The text included in this appendix consists mostly of direct excerpts from these documents. In some cases, changes have been made to improve the readability of the text. In other cases, corrections have been made to the text to ensure its accuracy.

## SECTION C.2: EXISTING GUIDANCE ON BASELINE PATHWAY

Several guidance documents provide recommendations on how to estimate emissions for future years. Among point source emissions, there are two major subsets: electric generating utilities (EGUs) and non-EGUs. The Clean Air Markets Division (CAMD) of the EPA uses the Integrated Planning Model (IPM)[1] to model emissions trading programs and to predict future-year emissions from EGUs. Other models and approaches may exist and could be used for estimation of future-year emissions. (Appendix E provides more information on what factors other approaches need to consider for the baseline pathway.) In addition, EPA Emissions Projection Guidance has general information on emission projections, which provides important factors that state, tribal and local agencies should consider when projecting emissions results for future attainment years.

[1] For more information on IPM, go to: http://www.epa.gov/airmarkets/progsregs/epa-ipm/index.html.

## SECTION C.3: EXISTING GUIDANCE ON CONTROL STRATEGY PATHWAY

The EPA's EE/RE Measures Guidance addresses the criteria needed for energy EE/RE measures to be considered approvable as a SIP control measure:

- Quantifiable
- Surplus
- Enforceable
- Permanent

### Quantifiable

The EE/RE Measures Guidance lists four steps to address when trying to quantify EE/RE measures:

- Step 1: Estimate the energy savings that an energy efficiency measure will produce, or, for a renewable energy project, the amount of energy generation that will occur.
- Step 2: Convert the energy impact in STEP 1 into an estimated emissions reduction.
- Step 3: Determine the impact from the estimated emission reduction on air quality in the nonattainment area.
- Step 4: Provide a mechanism to validate or evaluate the effectiveness of the project or initiative.

Thus, the guidance indicates that the emission reductions need to be quantifiable and include procedures to evaluate and verify over time the level of emission reductions actually achieved. The emission quantification approaches in this guidance may be used to address this criterion. Evaluation and verification methods can be found in best practices materials on establishing and implementing EE programs provided by the National Action Plan for Energy Efficiency (NAPEE).[2] However, since there can be many types of EE or RE programs covering many different areas, alternative protocols may also be acceptable, and would be evaluated, as necessary, on a case-by-case basis.

### Surplus

The EE/RE Measures Guidance indicates that emission reductions are surplus as long as they are not otherwise relied on to meet air quality attainment requirements in air quality programs related to your SIP. In the event that the measures to reduce utility emissions are relied on in a jurisdiction's plan to meet air quality-related program requirements, they are no longer surplus and may not be used as an additional reduction to meet SIP emission reduction requirements, such as the attainment demonstration or Reasonable Further Progress (RFP).

The importance of the surplus requirement in areas subject to a cap and trade program merits particular focus. To illustrate, if an EE program causes several EGUs that are part of a cap and trade program to scale back the amount of electricity they generate and, therefore, reduce

[2] For more information on NAPEE, go to: http://www.epa.gov/cleanenergy/energy-programs/suca/resources.html.

overall emissions, then, absent additional limitations discussed below, it may be difficult to show that these reductions meet the "surplus" criteria for crediting the measure. This is because the units are still allowed to emit up to the same number of allowances in the program even though the amount of electricity they need to generate has been reduced. The EE or RE measure, in effect, allows the EGUs to comply with the cap and trade program with a slightly higher average emission rate and a theoretically lower allowance price. Therefore, the estimated emission reductions from the EE or RE measure would typically not be surplus, and would essentially be double counted if EPA permitted the allowances that were freed up by the measure to be used in the trading program and if EPA provided additional SIP credit for the EE actions.

The presence of a cap and trade program, however, does not necessarily prohibit the use of EE and RE measures by a state agency to achieve additional SIP reductions. One acceptable way of achieving additional emission reductions from EE and RE measures in the presence of a cap and trade program is through the retirement of allowances commensurate to the emissions expected to be reduced by the EE measures. The retirement of allowances, which amounts to lowering the cap, assures that the EE measures will achieve emission reductions that are surplus to the emission reductions under the cap and trade program. Another way is to clearly demonstrate that emissions will decrease in the area despite the cap and trade program and the ability of plants to sell more electricity to other areas. This demonstration will likely entail a detailed analysis of electricity dispatch and allowance markets to determine the specific impact of the measures on the system.

## Enforceable

The EE/RE Measures Guidance indicates that EE/RE measures may be:

- Enforceable directly against a source;
- Enforceable against another party responsible for the energy efficiency or renewable energy activity; or
- Included under our voluntary measures policy where the state would be responsible for assuring that the emission reductions credited in the SIP occur.

The EPA believes that most measures you may consider under the guidance would fall into the second or third categories listed above. EE or RE measures are unlike traditional control measures on stationary sources. There is typically a physical distance between where the measure is implemented and where the emission reductions occur, as well as a geographic distribution to the emission reductions. Since EGUs are interconnected in the electric grid, a reduction in energy demand or generation from a renewable resource will likely affect the operation and emissions of several fossil fired units in the system. The EE or RE measure itself may be enforceable against the entities undertaking the activity even though they are not responsible for the operation of the electric generators at which the emission reductions are estimated for purposes of the SIP. For example, you could require certain entities to purchase an amount of RE. If you rely upon such requirements within the SIP, then this measure could be enforceable against those entities required to purchase the RE electricity or to reduce

energy consumption, even if those entities are not responsible for the operation of the electricity generating units at which the emission reductions are expected to occur.

If the reductions are "enforceable directly against the source" or are "enforceable against another party responsible for the energy efficiency or renewable energy activity," then the reductions are considered enforceable if:

- They are independently verifiable;
- Violations are defined;
- Those liable for violations can be identified;
- The state and EPA maintain the ability to apply penalties and secure appropriate corrective actions where applicable;
- Citizens have access to all the emissions-related and activity information obtained from the source;
- Citizens can file suits against the source or responsible party for violations; and
- They are practicably enforceable in accordance with EPA guidance on practicable enforceability.[3]

### Permanent

The EE/RE measure should be permanent throughout the term for which the credit is granted unless it is replaced by another measure or the state demonstrates in a SIP revision that the emission reductions from the measure are no longer needed to meet all applicable statutory and regulatory requirements.

## SECTION C.4: EXISTING GUIDANCE ON EMERGING/VOLUNTARY MEASURES PATHWAY

The EPA's Emerging/Voluntary Measures Guidance describes an emerging measure as a new emission reduction or pollutant reduction measure that is more difficult to accurately quantify than traditional SIP emission reduction measures. The difficulty in quantifying the emission or pollutant reductions may be due to scientific, technological, or informational uncertainty. The ability to quantify reductions from emerging measures may necessitate development of a protocol based on assumptions and/or modeling to estimate the reduction impacts of the emerging measure.

A voluntary measure is an action by a source that will reduce emissions of a criteria pollutant or a precursor to a criteria pollutant that the state could claim as an emission reduction in its SIP for purposes of demonstrating attainment or maintenance of the National Ambient Air Quality Standards (NAAQS), or RFP, but that is not directly enforceable against a source. The EPA's guidance also describes how states can identify individual voluntary and emerging measures and "bundle" them in a single SIP submission.

[3] EPA (1989) and EPA (1992).

## How a State Can Receive SIP Approval for Emerging/Voluntary Measures

The SIP submitted by the state to EPA:

- Identifies and describes the measure;
- Contains projections of emission or pollutant reductions attributable to the program, along with relevant technical support documentation:
    - For emerging measures, a full discussion of the relevant best available science supporting the measure;
- Enforceably commits the state to implement those parts of the measure for which the state or local government is responsible;
- Enforceably commits the state to monitor, evaluate, and report at least every three years to the public and EPA on the resulting emissions effect of the emission or pollutant reduction measure;
- Enforceably commits the state to remedy any SIP credit shortfall in a timely manner, if the program does not achieve projected emission reductions;
- Meets all other requirements for SIP revisions under sections 110 and 172, and any other applicable sections, of the Clean Air Act (CAA); and
- Undergoes public notice and comment (like any other SIP revision).

## Four Criteria for SIP Emerging/Voluntary Measures

The Emerging/Voluntary Measures Guidance addresses the criteria needed for energy EE/RE measures to be considered approvable as emerging/voluntary measures:

- Quantifiable
- Surplus
- Enforceable
- Permanent

### Quantifiable

Emissions and emission reductions attributed to the measure are quantifiable if someone can reliably measure or determine them and replicate the results. Any uncertainty in the quantification should be addressed by following the guidance contained in the Economic Incentives Program[4] in section 5.2 (b). A voluntary measure should meet this provision and, if the measure is also an emerging measure, then it should meet the criteria for emerging measures.

For emerging measures, EPA's policy provides flexibility for the quantification requirement. Some areas want to try new types of emission control or pollution reduction strategies. Some of these new strategies have a substantial chance to be as effective (and possibly more effective) than current measures in reducing criteria pollutant levels. The EPA supports and wishes to promote the testing of new emissions and pollutant control strategies. This policy provides a mechanism for states to receive provisional emission reduction credit in their SIP for

[4] EPA (2001).

new emission control and pollutant reduction strategies that have the potential to generate additional emission reductions or air quality benefits. Provisional emission reductions or pollutant reduction strategies can become permanent through a SIP revision when post-implementation evaluations validate the amount of emission reductions achieved. "Provisional" in this case means the state may use particular emission reductions for RFP or other purposes before the quantification procedure has been fully validated. Even though EPA believes that these emission reductions can be used to fulfill CAA emission reduction requirements, if post implementation evaluations do not show that all the projected emission reductions have occurred, the state would need to reconcile the difference between the projected and actual emission reductions. In order to encourage emerging new programs with which EPA and the states do not have significant experience, but which are technically and scientifically sound, the Agency believes it is appropriate to allow quantification based on best available science or information where direct, empirically verified data are not available. In these circumstances, the state should quantify the pollution reduction based on the best knowledge currently available for the measure being considered. The state should develop a protocol based on a carefully considered determination of the activities that it is committing to undertake and the activities' projected impact on pollution. The estimates may be based on modeling, on extrapolated experience for similar types of projects, or on another approach that is likely to yield a reasonable estimate of pollution reduction.

### Surplus

Emission reductions used to meet air quality attainment requirements are surplus as long as they are not otherwise relied on in air quality-related programs relating to a SIP. For voluntary and emerging measures, EPA believes these reductions should also be surplus to adopted state air quality programs, even those programs that are not in the SIP, such as a consent decree and federal rules that focus on reducing criteria pollutants or their precursors. For emission reductions used for attainment, RFP, maintenance or general conformity, the emission reductions cannot already be assumed for the same requirement, where the requirements are cumulative. An emission reduction may be used for more than one of these requirements. For example, emission reductions used to meet the RFP requirement may also be used for the attainment demonstration. However, emission reductions are not surplus if they have already been assumed in a program. In other words, states cannot claim emission reductions that are already assumed in the existing SIP, or that result from any other emission reduction or limitation of a criteria pollutant or precursor that the state is required to have to attain or maintain a NAAQS or to satisfy other CAA requirements. In the event that emission reductions relied on from a measure are subsequently required by a new air quality related program, such as those listed above, those emission reductions would no longer be surplus for this purpose.

### Enforceable

While EPA has already stated that voluntary measures are not enforceable against the source, the state would be responsible for ensuring that the emission reductions credited in the SIP do, in fact, occur. The state would make an enforceable commitment to monitor, assess, and report on the emission reductions resulting from the voluntary measures and to remedy any shortfalls from forecasted emission reductions in a timely manner, as discussed below.

Emission reductions and other mandatory state or local actions are enforceable against the source if, for each source:

- The emission reductions are independently verifiable;
- Program violations are defined;
- Those responsible for the violations can be identified;
- For emerging measures, the state and the EPA maintain the ability to apply penalties and secure appropriate corrective action where applicable;
- The emission reductions are enforceable in accordance with other EPA guidance on practicable enforceability;
- For voluntary measures, the EPA maintains the ability to apply penalties and secure appropriate corrective action from the state where applicable and the state maintains the secure appropriate corrective action with respect to portions of the program that are directly enforceable against the source;
- Citizens have access to all the emissions-related information obtained from the source; and
- For emerging measures, citizens can file suits against sources for violations.

### Permanent

The Emerging/Voluntary Measures Guidance indicates that an emission reduction strategy needs to continue throughout the term that the credit is granted unless it is replaced by another measure (through a SIP revision). Alternatively, the state can demonstrate in a SIP revision that the emission reductions from the measure are no longer needed to meet the criteria that apply to voluntary and emerging measures or any other CAA requirements.

## Emission Reduction Credit

The EPA believes that it is appropriate to presumptively limit the amount of emission reductions allowed for approval under this policy. Although EPA concludes that emerging measures are consistent with the statute because all emerging measures will be accompanied with an appropriate enforceable backstop commitment from the state as described in this policy, EPA believes it is appropriate to limit these measures to a small portion of the SIP, given the untested nature of the control mechanisms.

The presumptive limit is 6 percent of the total amount of emission reductions required for the RFP, attainment, or maintenance demonstration purposes. The limit applies to the total number of emission reductions that can be claimed from any combination of voluntary and/or emerging measures, including those measures that are both voluntary and emerging. The limit is presumptive in that EPA believes it may approve measures into a SIP in excess of the presumptive 6 percent when a clear and convincing justification is made by the state as to why a higher limit should apply in their case. Any request for a higher limit will be reviewed by EPA on a case-by-case basis. Any approval of emerging measures under this policy will be conducted through full notice-and-comment rulemaking in the context of a particular state SIP revision.

### Bundling Emerging/Voluntary Measures

As explained in EPA's Bundled Measures Guidance, emerging/voluntary measures can be bundled together. The emission reductions for each measure in the bundle would be quantified and, after applying an appropriate discount factor for uncertainty, the total reductions would be summed together in the SIP submission. After SIP approval, each individual measure would be implemented according to its schedule in the SIP. It is the performance of the entire bundle (the sum of the emission reductions from all the measures in the bundle) that is considered for SIP evaluation purposes, not the effectiveness of any individual measure.

## SECTION C.5: EXISTING GUIDANCE ON WOE PATHWAY

The EPA Modeling Guidance issued in 2007 addresses the weight-of-evidence (WOE) approach for attainment demonstrations. The guidance indicates that states/tribes should always perform complementary analyses of air quality, emissions and meteorological data, and consider outputs of modeling other than the results of the attainment test. Such analyses are instrumental in guiding the conduct of an air quality modeling application. Sometimes, the results of corroboratory analyses may be used in a WOE determination to show that attainment is likely despite modeled results (which may be inconclusive). The further the attainment test is from being passed, the more compelling the contrary evidence produced by corroboratory analyses would need to be to draw a conclusion different from that implied by the modeled attainment test results. If a conclusion differs from the outcome of the modeled test, then the need increases for subsequent, future review with more complete databases is increased. If the test is failed by a wide margin (e.g., future design values are outside the recommended range at an individual site or multiple sites/locations), it is far less likely that the more qualitative arguments made in a weight of evidence determination would be sufficiently convincing to conclude that the NAAQS will be attained.

In a WOE determination, states/tribes should review results from several diverse types of air quality analyses, including results from the modeled attainment test. As a first step, states/tribes should note whether the results of these analyses support a conclusion that the proposed strategy will meet the air quality goal. Second, states/tribes should weigh each type of analysis according to its credibility, as well as its ability to address the question being posed (i.e., is the strategy adequate for meeting the NAAQS by a defined deadline?). The conclusions derived in the two preceding steps are combined to make an overall assessment of the likelihood of meeting the air quality goal. This last step is a qualitative one. If the conclusion is that a strategy is inadequate to demonstrate attainment, then a new strategy is selected for review, and the process is repeated. States and tribes should provide a written rationale documenting the adequacy of the final selected strategy. Results obtained with air quality models are an essential part of a weight of evidence determination and should ordinarily be very influential in deciding whether the NAAQS will be met.

## REFERENCES

EPA (1989). *Guidance on Limiting Potential to Emit in New Source Permitting*. June 13, 1989. Available online at <http://www.epa.gov/reg3artd/permitting/t5_epa_guidance.htm>.

EPA (1992). *Use of Long Term Rolling Averages to Limit Potential to Emit*. February 24, 1992. Available online at <http://www.epa.gov/region7/air/title5/t5memos/rollave.pdf>

EPA (2001). *Improving Air Quality with Economic Incentive Programs*. January 2001. Available online at <http://www.epa.gov/ttncaaa1/t1/memoranda/eipfin.pdf>

United States Environmental Protection Agency

Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, NC

Publication No. EPA-456/D-12-001d
July 2012