Answers to Questions Posed to EPA on the August 27, 2012 Webinar on the Energy Efficiency/Renewable Energy Roadmap Manual

(10/9/12)

State Implementation Plans

- Q: What does "SIP" stand for?
- A: A State Implementation Plan (SIP) is a plan developed by a state detailing how that state will comply with the requirements of the federal Clean Air Act, administered by EPA. The SIP consists of narrative, rules, technical documentation and agreements that an individual state will use to meet the National Ambient Air Quality Standards.[1]

- Q: Please give us an example of where EPA would give State Implementation Plan (SIP) credit.
- A: The Roadmap Manual describes examples of states adopting energy efficiency/renewable energy (EE/RE) policies and programs for their 1997 8-hour ozone SIP. Appendix K of the Roadmap describes other opportunities to reduce electricity consumption and emissions of nitrogen oxides.[2] In addition, on slide #25 of the first presentation delivered during the webinar EPA details several different EE/RE policies and programs that could be candidates for emissions reduction credit under a SIP (subject to EPA regional office approval):
    - Energy Efficiency Resource Standards
    - State energy efficiency appliance standards
    - State-mandated municipal government electricity consumption reductions
    - Renewable Portfolio Standards
    - Local Renewable Energy Certificate purchases

- Q: Since all of the coal fired power plants providing energy to the Phoenix nonattainment area are not located within the nonattainment area, can the energy efficiency/renewable energy actions occurring within the Phoenix area still give SIP credit?
- A: Yes, it is possible to receive State Implementation Plan credit in this scenario for purpose of demonstrating attainment but not for purposes of satisfying the Clean Air Act Reasonable Further Progress requirement. The critical issue will be the need for the air planning agency to demonstrate that emission reductions at the power plants are estimated to benefit air quality in the nonattainment area. Appendix F (Section F.7) of the manual provides information that addresses this question.

- Q: Are there instances in which emerging and/or voluntary overlap?
- A: Yes, some measures could be considered both emerging and voluntary. For example, if an area wanted to include a green power purchase program in a State Implementation Plan, it could be considered emerging and voluntary. It could be considered emerging because quantifying the program's benefits would involve uncertainty given that funding for the program's future could be unknown. It could be considered voluntary since participation in the program is not mandatory.

[1] For more information, go to: http://www.epa.gov/airquality/urbanair/sipstatus/.
[2] For more information, go to: http://epa.gov/airquality/eere/pdfs/appendixK.pdf.

- Q: When you use the term "quantifiable" are you referring to forecasting estimates of savings from programs and policies on the books or measuring and verifying savings of these programs?
- A: Any emissions reductions accounted for in an attainment State Implementation Plan (SIP) must be quantifiable. In general, emissions and emissions reductions attributed to the energy efficiency/renewable energy (EE/RE) policy or program are quantifiable as long as someone can reliably measure or determine them and replicate the results. The SIP process requires air agencies to project into the future the energy impacts of EE/RE policies and programs in the future attainment year. The SIP pathway dictates the best way to quantify the emissions and emission reductions from EE/RE. For example, for the baseline pathway, an air agency can use an emissions forecast to account for existing EE/RE policies. The measurement and verification of Evaluation, Measurement and Verification (EM&V) procedures of energy impacts are also useful in a post-evaluation to determine if the energy savings claimed in the SIP were achieved. Appendix C of the Roadmap Manual outlines how to meet the quantifiable requirement for each of the SIP Pathways. Appendix I describes the emission quantification approaches recommended for each SIP pathway.

- Q: Please clarify the difference between the responses "surplus" and "yes" with respect to double counting category on documentation for the Control Strategy and Emerging/Voluntary Measures Pathways. (Slide 21 of the first presentation)
- A: This distinction was intended to capture what is in the current guidance. Current guidance indicates that control strategies and emerging/voluntary measures must meet the “surplus” requirement. Current guidance does not address the “surplus” issue per se for either the Baseline Emissions Projection Pathway or the Weight of Evidence (WOE) Pathway. For the Baseline Emissions Projection Pathway the manual (p. 34) states that “any EE/RE policies accounted for in the baseline cannot be incorporated in any other SIP pathway.” For the WOE Pathway the manual (p. 40) states that “emission reductions from mandatory energy efficiency and renewable energy policies and voluntary programs proposed for use in the WOE demonstration cannot be used elsewhere in the SIP. In other words, no double counting is permitted.”

- Q: Is Weight of Evidence (WOE) the only pathway that doesn't support jurisdictions getting State Implementation Plan (SIP) credit?
- A: No, all four pathways provide for different forms of SIP emissions benefits. However, it can be confusing because a WOE demonstration is made after the majority of the SIP planning work is completed, and is made in instances where the modeled attainment demonstration shows that an area does not meet the requirements of EPA’s modeled attainment test, but comes close to doing so. In such cases, WOE demonstrations can be used by states to show EPA the impact of emissions reduction measures that were not included in the attainment demonstration. In a WOE demonstration, a state could argue that had the measures been included in the attainment demonstration, the modeled attainment test may have been fully met and the area demonstrated attainment.

- Q: If energy efficiency programs are already accounted for in the emissions baseline, how can a state take credit for them in a State implementation Plan (SIP)?
- A: A state cannot double count credit for any policy, program or measure in a SIP. Specifically, for the Baseline Emissions Projection Pathway the manual states that “any EE/RE policies accounted for in the baseline cannot be incorporated in any other SIP pathway.” (p.34)

- The emissions baseline represents a snapshot of emissions at a certain point in time. The SIP then identifies what additional emissions reductions are needed beyond the baseline to bring the area into attainment. If an area's energy efficiency/renewable energy (EE/RE) strategies, policies and programs are included in the baseline, they still help the area reach attainment sooner by establishing a lower baseline.
- Air agencies need to keep in mind that there is a benefit to including EE/RE policies and programs in the baseline emissions projection pathway. When policies and programs are incorporated in the baseline emissions projection pathway, the emission impacts of the EE/RE effectively lower emissions in the future attainment year, thereby necessitating less control measures on other sources to meet the National Ambient Air Quality Standards.

- Q: What is meant by federal enforceability?
- A: This refers to what occurs in the State Implementation Plan (SIP) planning process when the EPA approves a SIP control strategy submitted to it for review and the SIP becomes federally enforceable. A federally enforceable SIP provides EPA with authority to ensure the SIP is implemented. Once energy efficiency/renewable energy policies and programs become federally enforceable, EPA has the authority under the Clean Air Act (CAA) to apply CAA-mandated penalties against the noncompliant party.

- Q: Is there any particular trigger or timetable for the states to revise State Implementation Plans (SIPs) to include energy efficiency/renewable energy?
- A: Yes, below is the latest timetable for the current schedule for ongoing EPA reviews of National Ambient Air Quality Standards (NAAQS). Generally, after a NAAQS is finalized EPA "designates" areas as nonattainment and attainment. SIPs are due three years from the date designations are effective. The 2008 ozone NAAQS is not shown on the chart; SIPs for that NAAQS will be due in 2015.

MILESTONE	POLLUTANT						
	NO_2/SO_2 Secondary	**PM**	**Ozone**	**Lead**	**NO_2 Primary**	**SO_2 Primary**	**CO**
Notice of Proposed Rulemaking	**Jul 12, 2011**	**Jun 14, 2012**	**2013**	**Feb 2014**	**Aug 2015**	**Feb 2016**	**Jul 2016**
Notice of Final Rulemaking	**Mar 20, 2012**	**Dec 14, 2012**	**2014**	**Nov 2014**	**May 2016**	**Nov 2016**	**Apr 2017**

NOTE:
Underlined dates indicate court-ordered or settlement agreement deadlines.

Emissions Quantification Tools

- Q: Do the eGRID subregions line up geographically with the region analyses maps in the Hourly Marginal Emissions Tool?
- A: The regions in the Hourly Marginal Emissions Tool are not the same as the eGRID subregions. The regions are aggregate-level regions that represent reasonably autonomous electricity market trading and dispatch regions as shown below.

Regions in Hourly Marginal Emissions Tool

- Q: Since real-world dispatch is based on cost, but EPA does not have cost data, how is dispatch priority determined?
- A: Dispatch loading order is determined differently for the Power Plant Emissions Calculator (P-PEC) and the Hourly Marginal Emissions Tool. For the P-PEC, annual capacity factors for each power plant within one eGRID subregion are used to determine the dispatch order. Capacity factors represent the ratio between the maximum capacity of a plant compared to the actual generation of a plant within a specific time frame. We assume plants with low capacity factors that have operated a few hours within a given year would be displaced first and plants that have operated close to maximum capacity would be displaced last. This is a simplified assumption in the tool.
- The Hourly Marginal Emissions Tool uses historic hourly emissions data from EPA's Air Markets Program database to determine the dispatch order. Generally, low priced electric generating units (EGUs) are dispatched "first" to meet load requirements – i.e., given a cohort of EGUs, the lowest variable cost units are brought online preferentially to the high-cost EGUs. As demand for fossil resources increases through peak hours, increasingly expensive EGUs are brought online. Ideally, given no other constraints,[3] EGUs will dispatch into a system in a regular economic order based on the cost of fuel, the heat rate of the unit, and other variable costs of production. The background statistical model of the Hourly Marginal Emissions Tool records all instances of when an EGU is online and how much power it produces when online, and compares that information to the total demand of the system. By recording these statistics, the Hourly Marginal Emissions Tool can then predict which EGU will generate and emit pollution at various load levels. This information is used to estimate how generation and emissions change as load is reduced by EE/RE.

[3] Constraints on a system include: transmission constraints, ramp rates, scheduled and forced outages, minimum down times for maintenance and emergencies and minimum generation requirements.

- Q: How does the methodology embedded in the marginal emissions tool compare to the method Independent System Operator (ISO) New England is using for its Marginal Emissions Analysis Pilot? Has EPA reviewed the ISO's method?
- A: There are three main differences between the marginal emissions analysis that ISO New England produced and the Hourly Marginal Emissions Tool developed by EPA.
    - First, the main difference is that the Hourly Marginal Emissions Tool only includes units from the EPA's database, whereas the ISO New England's approach starts with units in EPA's database and then supplements its inventory of units with additional sources, such as NEPOOL GIS[4] and EPA's eGRID.[5]
    - Second, ISO New England uses production simulation models to replicate, as closely as possible, the actual system operations for the study year (reference case). Then, ISO NE models an incremental load scenario in which the system load was increased by 500 MW in each hour (marginal case; see 2009 ISO New England Electric Generator Air Emissions Report[6], p. 8). The methodology used in EPA's Hourly Marginal Emissions Tool does not use a production simulation model. Rather it parses through dense, raw hourly data on how electric generating units (EGUs) have operated in the recent past, and creates a detailed empirical database about which EGU produces energy and produces emissions under different load conditions. At its core, the tool estimates the most likely generation and emissions from a fossil EGU given a certain level of demand from a historical year. The tool records all instances of when an EGU is online and how much power it produces when online, and compares that information to the total demand of the system. By recording these statistics, the tool can then predict which EGU will generate and emit pollution at various load levels. This is used, to estimate how generation and emissions change as load is reduced by energy efficiency/renewable energy.
    - Third, based on their 2009 report, ISO New England assumes that units fueled with coal, wood, biomass, refuse, or landfill gas are excluded from their marginal avoided emissions calculations (see 2009 ISO New England Electric Generator Air Emissions Report, p. 9, 2009). The EPA does not make that distinction in our tool; we allow the data to drive which units are on the margin for each hour.

Tribal Implementation Plans

- Q: Are these tools appropriate for small tribal entities?
- A: The Power Plant Emissions Calculator would be a more appropriate tool for small tribal entities of the two EPA is offering.

Energy Efficiency/Renewable Energy Policies and Programs

- Q: Does EPA recognize energy efficiency savings from utility sponsored efficiency programs that are not required by a mandatory Energy Efficiency Performance Standard?
- A: The emission benefits of voluntary and mandatory policies and programs are both eligible for inclusion in the State Implementation Plan. It is important to ensure there is no double counting between the two efforts.

[4] For more information, go to: http://www.nepoolgis.com/help/getting_started/navigating_system.htm.
[5] For more information, go to: http://epa.gov/cleanenergy/energy-resources/egrid/index.html.
[6] For more information, go to: http://www.iso-ne.com/genrtion_resrcs/reports/emission/index.html.

- Q: How is "mandatory policy" defined?
- A: Mandatory renewable energy policies are **r**egulations, statutes, or state public utility commission orders that require parties to acquire renewable energy or to commit to funding levels for programs aimed at acquiring renewable energy. Mandatory energy efficiency policies are enacted law and/or regulation by a state, locality, or public utility commission order which requires applicable entities to adopt energy efficient technologies and/or practices, or to undertake activities to further such adoption in the marketplace.

- Q: What does "white tags" mean?
- A: White tags are documents certifying that a certain reduction of energy consumption has been attained. In most applications, the white certificates are tradable and combined with an obligation to achieve a certain target of energy savings. Under such a system, producers, suppliers or distributors of electricity, gas and oil are required to undertake energy efficiency measures for the final user that are consistent with a pre-defined percentage of their annual energy deliverance. If energy producers do not meet the mandated target for energy consumption, they are required to pay a penalty. The white certificates are given to the producers whenever an amount of energy is saved whereupon the producer can use the certificate for their own target compliance or can be sold to (other) parties who cannot meet their targets.

- Q: What role does Evaluation, Measurement and Verification (EM&V) play in the inclusion of energy efficiency/renewable energy in State and Tribal Implementation Plans (SIPs/TIPs)?
- A: Energy efficiency forecasts – not ex-post evaluation, EM&V – are the appropriate information used for estimating avoided-emissions in a future attainment year for SIP submissions. However, ex-post EM&V is relevant in the SIP/TIP context, as follows:
    - EM&V data can be used to verify that EE policies and programs actually deliver expected savings over the SIP/TIP compliance period.
    - EM&V can also provide a mechanism for states to update and improve their energy-savings projections over time, thereby bolstering the credibility of EE projections included in future SIPs/TIPs.
    - Separately, robust EM&V can help improve the overall credibility of EE as an emissions reduction resource.

- Q: Will Evaluation, Measurement and Verification (EM&V) include actual utility generation (supply), as well as EE performance success (demand)?
- A: Energy efficiency forecasts – not ex-post evaluation, EM&V – are the appropriate information used for estimating avoided-emissions in a future attainment year for SIP submissions. However, ex-post EM&V is relevant in the State Implementation Plan (SIP) context, as follows:
    - EM&V data can be used to verify that energy efficiency (EE) policies and programs actually deliver expected savings over the SIP compliance period.
    - EM&V can also provide a mechanism for states to update and improve their energy-savings projections over time, thereby bolstering the credibility of EE projections included in future SIPs.
    - Separately, robust EM&V can help improve the overall credibility of EE as an emissions reduction resource.

- Q: Is it possible to imagine a scenario where a state without an Energy Efficiency Resource Standard (EERS) or Renewable Portfolio Standard (RPS) might nonetheless investigate emission reduction credits based on strong EGU programs specific to a non-attainment area?
- A: There are many types of energy efficiency and renewable energy policies and programs utilities implement. Even if a State does not have an EERS or RPS, it is worth investigating the programs utilities are implementing within a state, locality or tribal nation. Keep in mind that the larger the energy efficiency (EE) or renewable energy policy or program the greater potential for emission reduction benefits. To save time, you could group multiple programs together to assess the energy impacts rather than evaluating individual EE measures.

- Q: Please explain combined heat and power (CHP).
  A: Also known as cogeneration, CHP is an efficient, clean, and reliable approach for generating power and thermal energy from a single fuel source. A typical installation will produce both electricity and also waste heat recovery that can be used to supply heat to buildings or to meet manufacturing process heating needs. Since less fuel is burned to produce each unit of energy (electricity and thermal) output, CHP reduces air pollution and greenhouse gas emissions. As a result, the emission benefits from CHP systems can be recognized for State Implementation Plan/Tribal Implementation Plan credit. Typical CHP configurations include gas turbines or engines with heat recovery units or steam boilers with a steam turbine. The EPA's Combined Heat and Power Partnership contains additional information about this resource.[7]

- Q: Just as the EPA allowed for Renewable Energy Credits (RECs) to be used for voluntary renewable (RE) achievement for State Implementation Plan (SIP) credit, will the EPA now consider White Tags to qualify for energy efficiency (EE) achievement in SIPs?
- A: We will further investigate the use of White Tags in SIPs and update the roadmap manual as new information becomes available. Most importantly, the energy savings from a REC or EE policy or program should meet the four main criteria for an attainment SIP: permanent, quantifiable, enforceable and surplus. The way each of these criteria is applied to the pathways is described in the different appendices in the Roadmap Manual.
- In addition, air agencies will want to demonstrate that the energy impacts resulting from an EE program or RECs purchase is estimated to reduce emissions upwind or in the specific nonattainment area in the SIP. The EPA has developed new tools to help air agencies quantify the emission impacts of EE or RE policies or programs. The Draft Power Plant Emissions Calculator and Hourly Marginal Emissions Tool are tools air agencies can translate the energy savings to emissions reductions. The Hourly Marginal Emissions Tool is scheduled to be publically available in early 2013.

- Q: Will the investment by a state or city into a commercial building's energy efficiency either through a grant or energy efficient credit count towards a State Implementation Plan (SIP) under the Emerging/Voluntary Measures Pathway so long as the measure meets the checklist on page 18?
- A: Yes, the type of funding mechanism is less relevant than ensuring the measure is implemented as planned and that the expected funding level is achieved. For SIPs, the energy efficiency (EE) program needs to meet the four criteria contained in slide #18 (permanent, enforceable, quantifiable and surplus). In addressing the criteria the jurisdiction would need to estimate the projected energy savings from the EE program in the future attainment year and

[7] For more information, go to: http://www.epa.gov/chp/.

the emission impacts of the energy savings related to the specific nonattainment area. Appendix G of the Roadmap Manual describes the documentation requirements for the emerging and voluntary pathway.

- Q: On slide 25 you recognize Renewable Energy Certificates, but not tradable Energy Efficiency Certificates or White Tags. Could they also be used for energy efficiency (EE) the way Renewable Energy Credits (RECs) are used for renewable energy (RE)?
- A: We will further investigate the use of White Tags in SIPs and update this document as new information becomes available. Most importantly, the energy savings from an EE policy or program should meet the four main criteria for an attainment State Implementation Plan. That is permanent, quantifiable, enforceable and surplus. The way each of these criteria is applied to the pathways is described in specific appendices in the Roadmap Manual.

- Q: Is there any value of energy efficiency/renewable energy (EE/RE) if the state has no nonattainment areas?
- A: Yes, there are multiple benefits of adopting EE/RE policies and programs even if a state does not have nonattainment areas. These include:
    - Increased electric system security, diversity, and overall reliability improvements for the electric system
    - Improved environmental quality, human health and quality of life
    - Increased economic prosperity through energy costs saved, avoided medical costs, higher disposable incomes, increased labor productivity and more jobs
- Understanding the range of environmental, economic and electric system benefits of clean energy can help planners:
    - Comprehensively assess the full value of clean energy investments
    - Strengthen how benefits are incorporated in cost-benefit analyses
    - Demonstrate how clean energy initiatives can cost-effectively achieve cross-cutting energy, environmental, and economic goals
    - Identify opportunities where clean energy can be used to support environmental, economic development energy system planning strategies across the state or locality
- For more information on how to assess the multiple benefits of EE/RE refer to the Multiple Benefits Guide of Clean Energy.[8]

- Q: How do you make sure that emission displacement occurs, and not that the extra capacity gets sold into wholesale market?
- A: First, in most cases electricity is not produced and stored, but rather it is produced and consumed by system demand in a balance that system operators attempt to keep in a steady state of equilibrium. Therefore, as energy efficiency program remove demand from the electrical grid, system operators will require fewer generators operate to meet this reduced demand. It is very difficult to track the way energy is sold and bought throughout the United States. The EPA's focus is on the energy impacts of the energy efficiency/renewable energy policy or program that is assumed in the State Implementation Plan (SIP). Proper documentation on the energy impacts of a policy or program, emission quantification method employed, how the state or local authority is tracking the energy impacts in a future year and any incentives or penalties related to achieving those savings are a few components that could

[8] For more information, go to: http://epa.gov/statelocalclimate/resources/benefits.html.

be included in a SIP submitted to demonstrate the way to check and see if the anticipated savings has occurred.

Miscellaneous

- Q: I've heard there will be a separate webinar specifically for ozone advance program areas?
- A: Yes, EPA plans to hold a webinar on energy efficiency/renewable energy (EE/RE) tools and related information for Ozone Advance Program areas in late October. Check the Ozone Advance Program website for details: http://www.epa.gov/ozoneadvance/.