Navigating EPA's Clean Power Plan for Compliance with Renewable Energy

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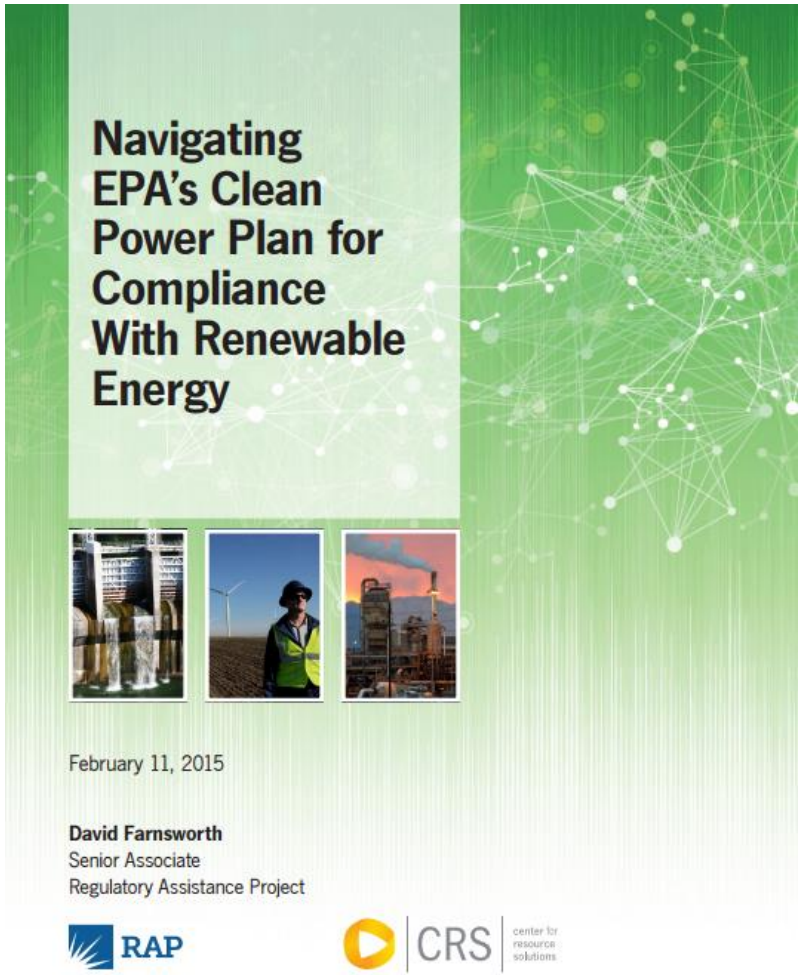
The Regulatory Assistance Project (RAP)™

This presentation is based "Navigating EPA's Clean Power Plan for Compliance with Renewable Energy"

http://www.resourcesolutions.org/pub_pdfs/Navigating%20EPAs%20Clean%20Power%20Plan%20for%20Compliance%20with%20Renewable%20Energy.pdf



Outline

1. Introduction
2. A tension between flexibility and the need to demonstrate compliance
3. Using RE and Trading RECs Under the CPP

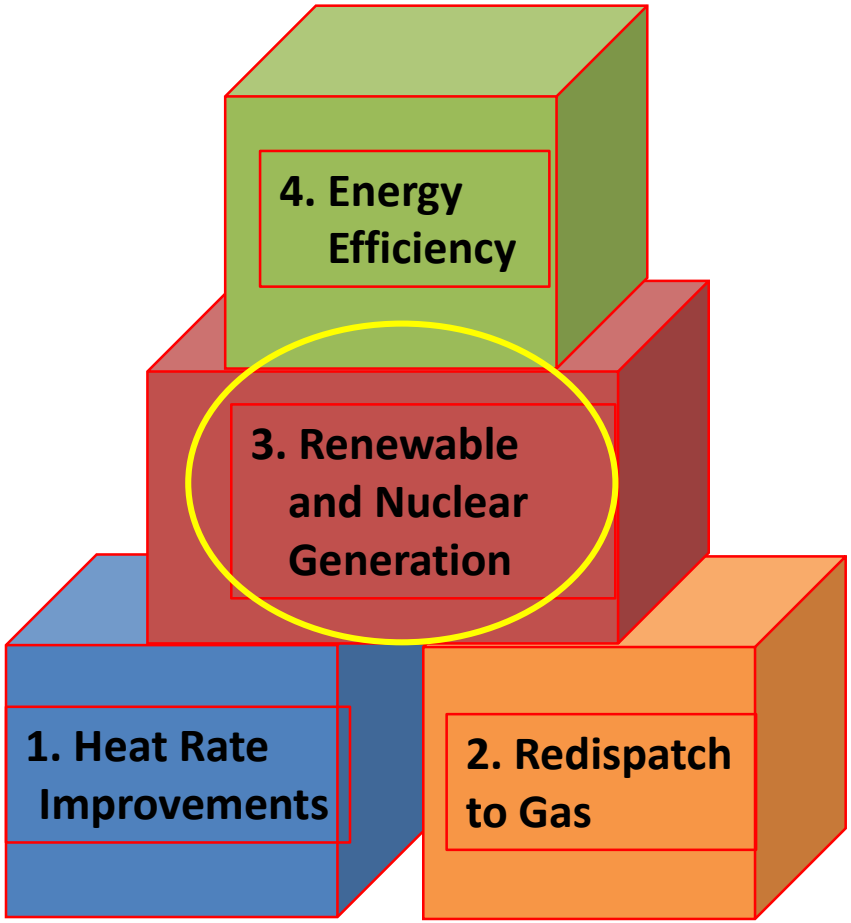
Introduction

- The genius of the CPP, i.e., *distinctive character or spirit* is that is **seeks to build on <u>all</u>** the clean power:
  - **Investment** that states are making,
  - **Technology advances**, and
  - Other **clean energy trends**.
- **An opportunity to leverage** those trends.

Introduction: 111(d) Structure

- Section 111(d) of the Clean Air Act directs:
  - EPA to define the "Best System of Emissions Reduction" and the
- States to produce "Compliance Plans" subject to EPA review and approval.

EPA Defines Best System of Emissions Reduction (BSER): Building Blocks



RE Trading Could Facilitate Multi-State Compliance Approaches

- **Better for power sector**:
  - Allows broader reliability regions
  - More compliance options = lower cost
- **Better for states**:
  - Fewer "seams" issues
  - Lighter lift; shared/lower costs
  - Strength in numbers
- **Better for EPA**:
  - Less reliability & cost risk
  - Fewer, faster approvals

RE Trading Could Facilitate **Modular** Multi-State Compliance Approaches

- States develop individual compliance plans, but with **portions of those plans** developed in voluntary collaboration with other states.
- Potential for
  - **Lower-cost** compliance solutions
  - **Tailored** to the specific circumstances
  - While allowing the **states** to **retain most** or all of the **regulatory autonomy** they would otherwise have.

CPP—not all Flexibility
States must Demonstrate Compliance

Is the emissions standard:

- Quantifiable?
- Non-duplicative?
- Permanent?
- Verifiable?
- Enforceable?

Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," June 18, 2014, 79 FR 34918-34919, 34913.

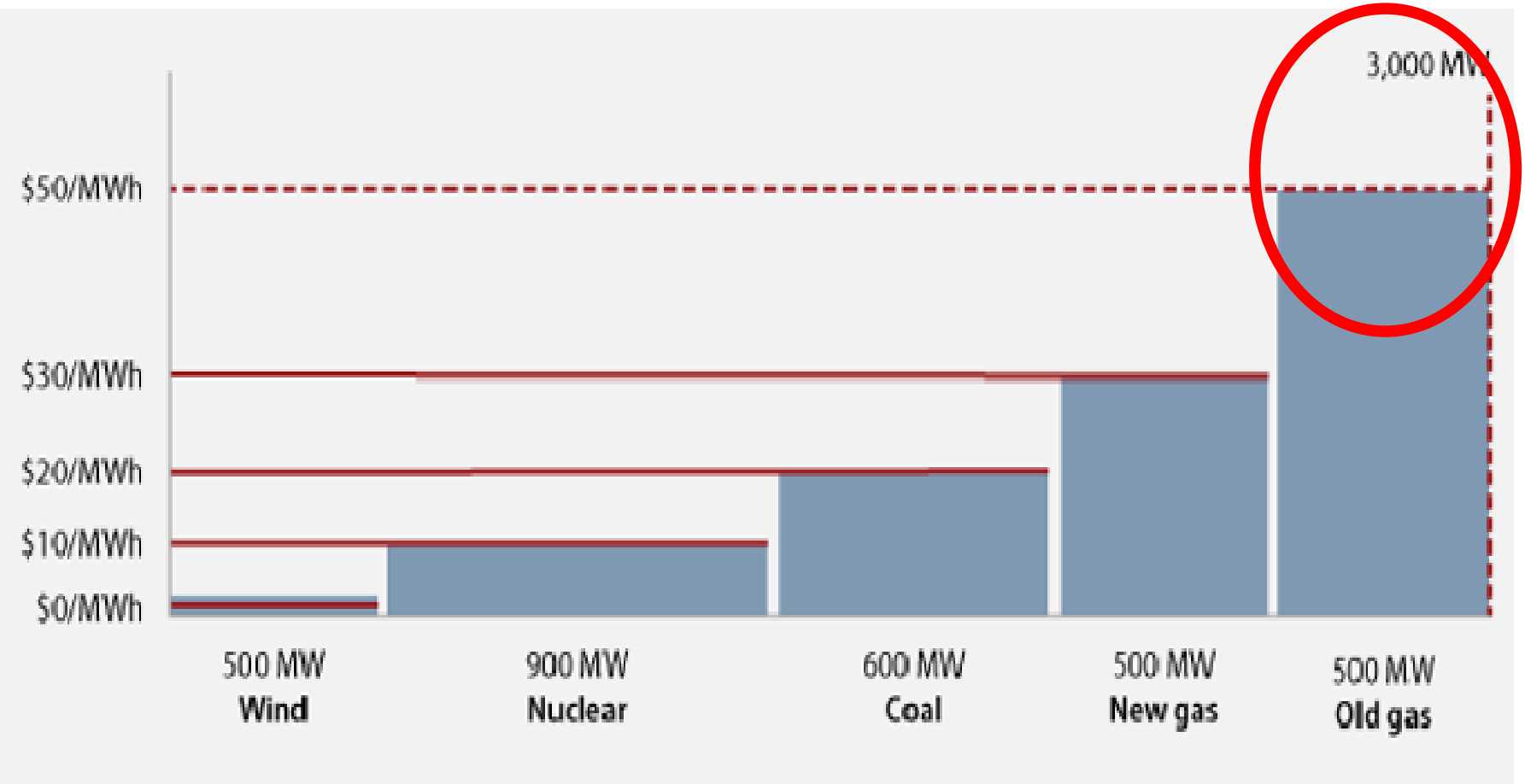
Determining Avoided Emissions

- **If** avoided emissions **data** for renewable resources are **available**, regulators will need to know how they were developed in order to assess their suitability.

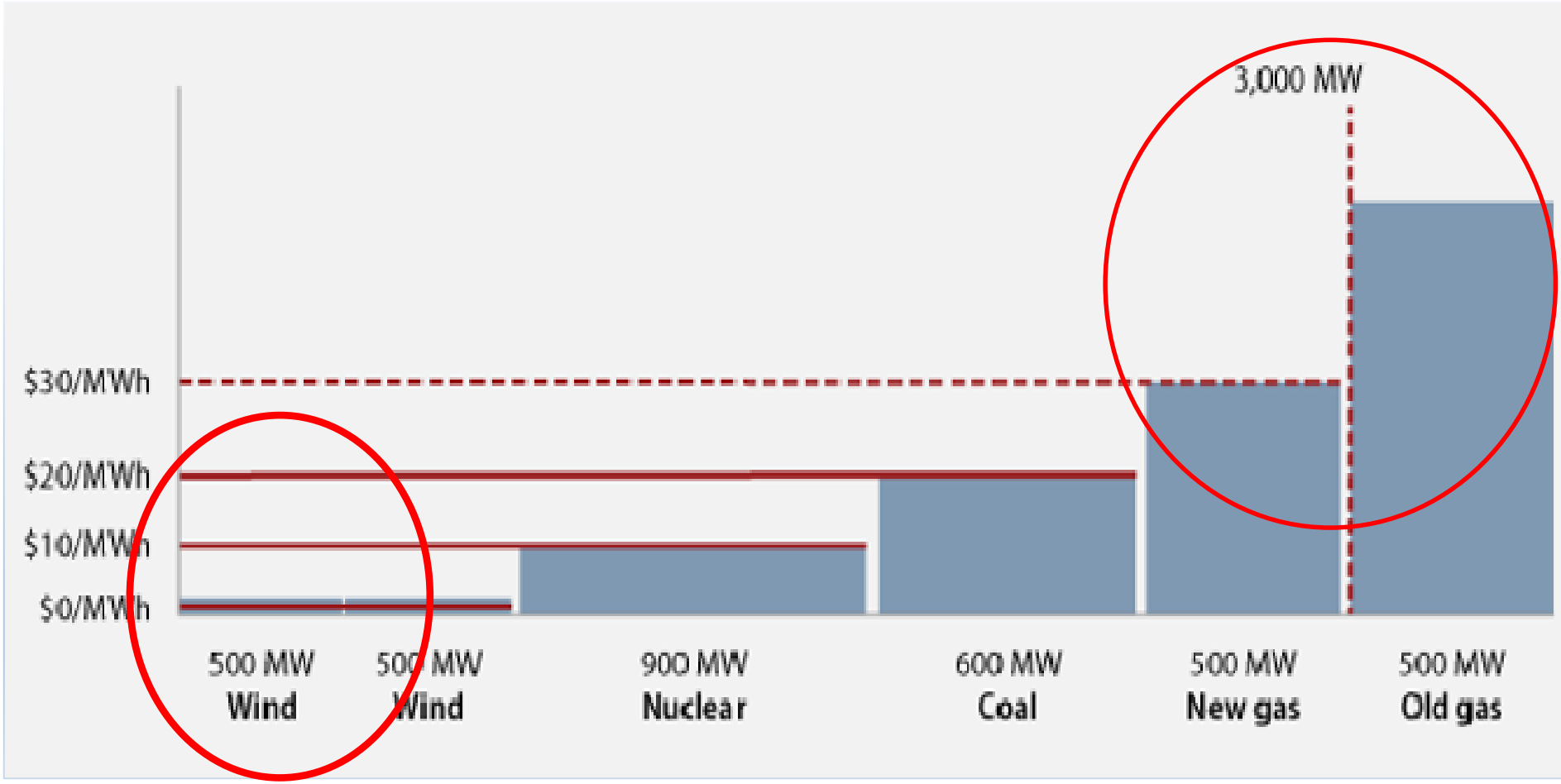
- **If** such **data** are **unavailable**, regulators will need to be able to develop their own avoided emissions estimates.

- The three most widely used **methods**:
  - Average Emissions
  - Marginal Emissions
  - Dispatch modeling

Avoided Emissions: An Illustration



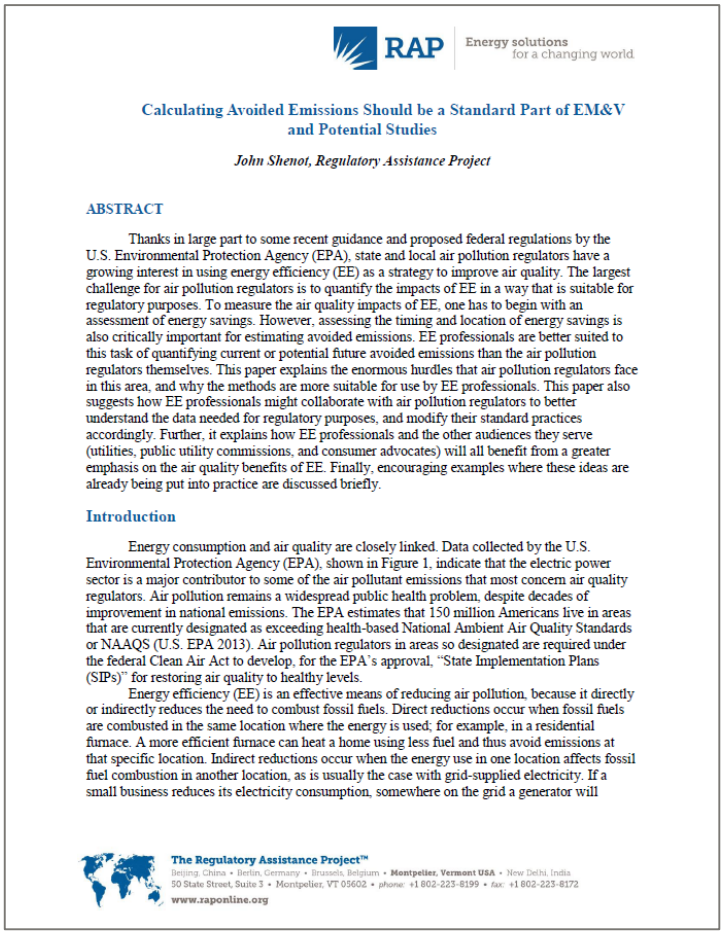
Avoided Emissions: An Illustration



Avoided Emissions

- Wyoming: approx. 2,000 lbs/MWh
- Connecticut: approx. 1000 lbs/MWh

Two RAP Resources re: Avoided Emissions



RAP Energy solutions for a changing world

Calculating Avoided Emissions Should be a Standard Part of EM&V and Potential Studies

John Shenot, Regulatory Assistance Project

ABSTRACT

Thanks in large part to some recent guidance and proposed federal regulations by the U.S. Environmental Protection Agency (EPA), state and local air pollution regulators have a growing interest in using energy efficiency (EE) as a strategy to improve air quality. The largest challenge for air pollution regulators is to quantify the impacts of EE in a way that is suitable for regulatory purposes. To measure the air quality impacts of EE, one has to begin with an assessment of energy savings. However, assessing the timing and location of energy savings is also critically important for estimating avoided emissions. EE professionals are better suited to this task of quantifying current or potential future avoided emissions than the air pollution regulators themselves. This paper explains the enormous hurdles that air pollution regulators face in this area, and why the methods are more suitable for use by EE professionals. This paper also suggests how EE professionals might collaborate with air pollution regulators to better understand the data needed for regulatory purposes, and modify their standard practices accordingly. Further, it explains how EE professionals and the other audiences they serve (utilities, public utility commissions, and consumer advocates) will all benefit from a greater emphasis on the air quality benefits of EE. Finally, encouraging examples where these ideas are already being put into practice are discussed briefly.

Introduction

Energy consumption and air quality are closely linked. Data collected by the U.S. Environmental Protection Agency (EPA), shown in Figure 1, indicate that the electric power sector is a major contributor to some of the air pollutant emissions that most concern air quality regulators. Air pollution remains a widespread public health problem, despite decades of improvement in national emissions. The EPA estimates that 150 million Americans live in areas that are currently designated as exceeding health-based National Ambient Air Quality Standards or NAAQS (U.S. EPA 2013). Air pollution regulators in areas so designated are required under the federal Clean Air Act to develop, for the EPA's approval, "State Implementation Plans (SIPs)" for restoring air quality to healthy levels.

Energy efficiency (EE) is an effective means of reducing air pollution, because it directly or indirectly reduces the need to combust fossil fuels. Direct reductions occur when fossil fuels are combusted in the same location where the energy is used; for example, in a residential furnace. A more efficient furnace can heat a home using less fuel and thus avoid emissions at that specific location. Indirect reductions occur when the energy use in one location affects fossil fuel combustion in another location, as is usually the case with grid-supplied electricity. If a small business reduces its electricity consumption, somewhere on the grid a generator will

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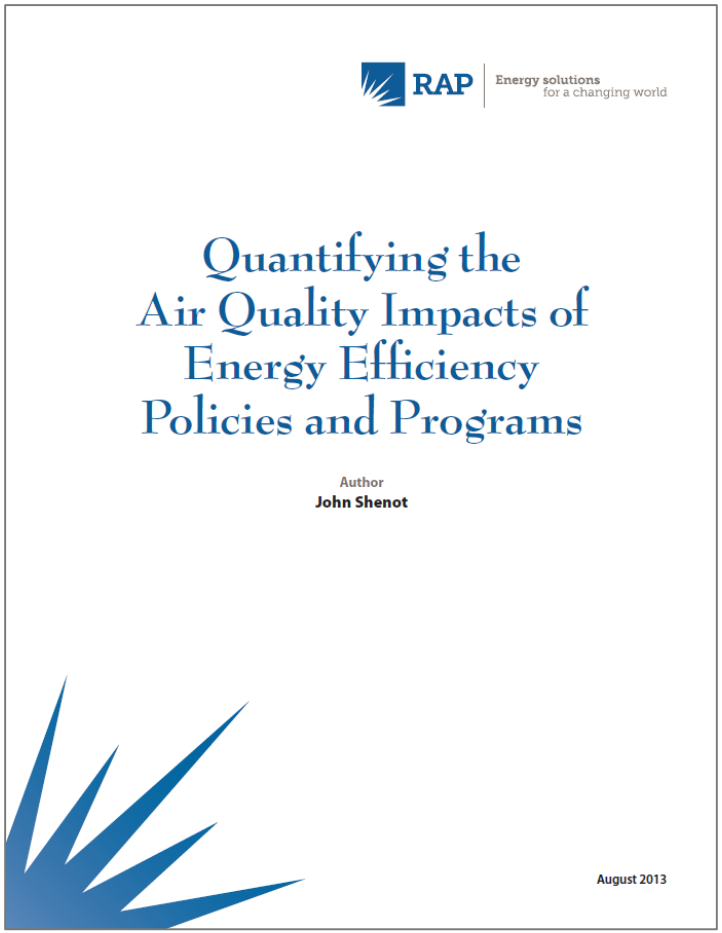

RAP Energy solutions for a changing world

Quantifying the Air Quality Impacts of Energy Efficiency Policies and Programs

Author
John Shenot

August 2013

Compliance With Renewable Energy

- **To credit** avoided **emissions** from RE, States can rely on **existing regional crediting mechanisms** or develop **new ones**
- **RECs** are already produced, tracked, sold, and retired for RPS purposes, but there is a
  - Need for **common methodology** for **characterizing and crediting emissions** reductions.
  - Examples: ME and DE Energy Disclosure.

CPP Compliance: Rate-Based State

Q: How would a REC apply?

A: Either to an emissions rate's:

- Numerator (avoided CO_2 value), or
- Denominator (a "zero emissions" MWh)

Numerator

- Example:
  - Assume a generator with a stack emission rate of 1,500 lbs CO_2/MWh generates 1,000 MWh.
  - And that 500 RECs, determined to have avoided CO_2 at a rate 800 lbs/MWh, are credited to the generator when calculating the generator's adjusted CO_2 emission rate.
  - The adjusted CO_2 emission rate is 1,500,000 lbs CO_2 minus 400,000 lbs CO_2 credits divided by 1,000 MWh, which equals a CO_2 emission rate of 1,100 lbs CO2/MWh.

$$CO_{2\ Emissions\ Rate_{adj}} = ((1{,}000\ MWh * 1{,}500\ lbs/MWh) - (500\ MWh_{RE} * 800\ lbs/MWh)) / 1{,}000\ MWh = 1{,}100\ lbs/MWh$$

Denominator

- Example:
  - Assume a generator with a stack emission rate of 1,500 lbs CO_2 /MWh generates 1,000 MWh.
  - And that 1,000 emission-free MWh RECs for the effect of renewable generation are credited to the generator when calculating its adjusted CO_2 emission rate.
  - The adjusted CO_2 emission rate is 1,500,000 lbs CO_2 divided by 2,000 MWh, which equals a CO_2 emission rate of 750 lbs CO_2 /MWh.

$$CO_{2\ adj}\ \text{Emissions Rate} = (1000\ \text{MWh} * 1500\ \text{lbs/MWh}) / (1000\ \text{MWh} + 1000\ \text{MWhRE}) = 750\ \text{lbs/MWh}$$

CPP Compliance: Mass-Based State

- Mass-based approach **captures all emissions** reductions that occur at covered plants — **whatever the reason** for the reductions.

- No need to develop a crediting mechanism **for** Clean Power Plan **compliance purposes**.
  - State **reports total emissions** (tons) to demonstrate compliance.
- **However, RECs** and their role in meeting RPS are still useful:
    - for **planning purposes** and
    - for **regional trading.**

RE Trading

- Out of a **Rate-based state**
  - **If not** used **for in-state compliance**, **RECs** could **travel** and be used elsewhere.
    - For its CO_2 value – numerator
    - As a MWh – denominator

- Out of a **Mass-based state**
  - **Value of RE** already **assumed in the State's** bottom-line **emissions**.
  - **If RECs are sold** out of a mass-based program, **adjustments required** to avoid double counting:

    - See, e.g., RGGI's "Voluntary Renewables Set-Aside Account"

Observations

- Considering potential criteria against which state plan compliance will be measured,
  - **RE benefits** are demonstrably "quantifiable, non-duplicative, permanent, verifiable, and enforceable…."

- **REC ownership and retirement** is
  - An established means of demonstrating claims to avoided emissions from RE and
  - A reasonable basis upon which multiple states could engage in cooperative compliance efforts.

- There are **reasonable means for determining avoided emissions** (EPA Guidance needed).

- Having these systems in place nationwide, avoids the need to create a new 111(d) tracking/accounting systems for RE and emissions benefits.

One Final Thought

- While RECs are used regionally, with **two changes**, couldn't RECs be **traded nationwide**?

  1. **EPA** — Provide a common methodology for crediting avoided CO_2 for all RECs

  2. **State Plans** – Remove RPS "deliverability requirements" (i.e., that electrons from RE project could be delivered into region where REC is used) for purposes of Clean Power Plan Compliance.

- **Result**:
  - RECs would better reflect the amount of CO_2 they displace
    - Increasing the REC's value, and
    - Potentially stimulating greater clean energy investment in more carbon-intensive regions.

Thank You

About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power sector. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

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