

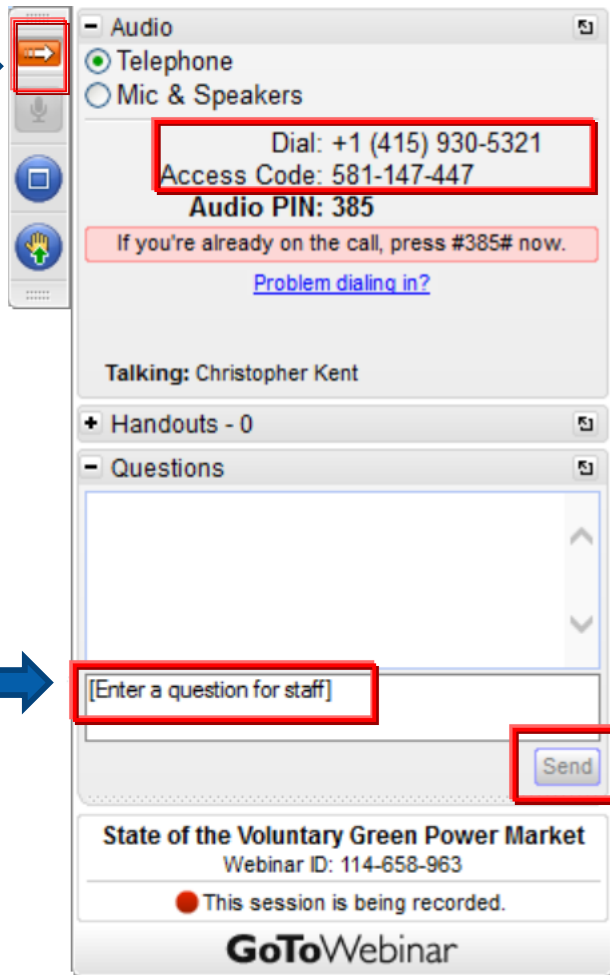
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Renewable Energy in the Clean Power Plan

January 28, 2016

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Outline

- Summary
- Goal Setting & Building Block 3
- State Plans & Renewable Energy
- Early Action & the Clean Energy Incentive Program (CEIP)
- Information and Resources



Renewable Energy in the Clean Power Plan

- EPA recognizes the role renewable energy is already playing in reducing emissions in the power sector and encourages renewable energy development to meet the Clean Power Plan goals.
- **Renewable energy played an important role in setting the Clean Power Plan goals.** The Clean Power Plan goals are based in part on the proven potential for new renewable energy to produce power with fewer carbon emissions, and reduce the utilization of existing sources of carbon pollution.
- **EPA anticipates that renewable energy will be a significant strategy for states and existing sources.** Renewable energy can effectively reduce utilization of affected electric generating units (EGUs) and carbon pollution.
- Renewable energy becomes more cost-competitive with limits on carbon pollution from affected EGUs, which provides an incentive to deploy new renewable energy.



Role of Renewables in Goal Setting

- **Renewable energy played an important role in setting the Clean Power Plan goals.**
- CPP builds on current investments in renewable energy (RE).
- New utility-scale RE is the basis for building block 3 (BB3) of the “best system of emission reduction” (BSER) used in goal setting.
 - Includes onshore wind, utility-scale solar photovoltaic, concentrated solar power, geothermal and hydropower.
 - Final CPP increased contribution of onshore wind and utility-scale solar in BB3 following new information on lower costs and improved performance.
- BB3 quantifies new RE across each of the three electric grid interconnects because of the interstate nature of the power system and electricity markets.
- The following are not part of BB3 for goal setting:
 - Existing RE (pre-2013);
 - State renewable portfolio standard (RPS) requirements;
 - Roof-top solar and other RE sited at homes and businesses.
- Roof-top solar (and other RE sited at homes and businesses) can be used to meet goals or emission performance rates



States and Affected Electric Generating Units Can Use Many Measures to Lower CO₂ Under the Clean Power Plan

Measures include, but are not limited to:

- Heat rate improvements
- Fuel switching to a lower carbon content fuel
- Carbon capture and utilization for existing sources
- Carbon capture and sequestration for existing sources
- Integration of renewable energy into EGU operations
- Combined heat and power
- Qualified biomass co-firing and repowering
- Renewable energy (new & capacity uprates)
 - Wind, solar, hydro, waste-to-energy, wave and tidal power
- Nuclear generation (new & capacity uprates)
- Demand-side Energy Efficiency programs and policies, including water system efficiency
- Demand-side management measures
- Electricity transmission and distribution improvements (e.g. conservation voltage reduction)
- Others

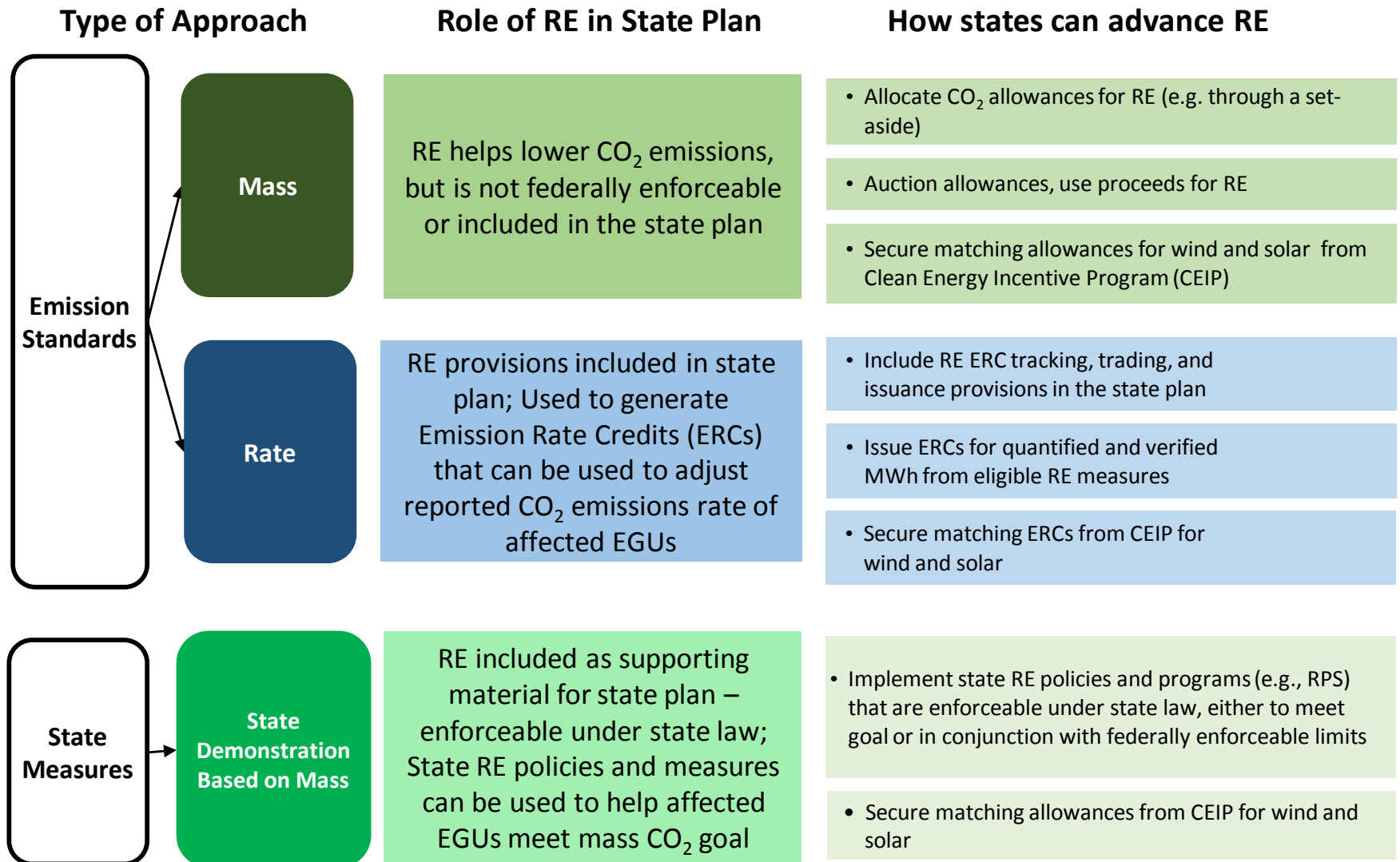


Role of RE in Reducing CO₂ Emissions

- States have broad discretion to determine how best to reduce emissions from existing facilities, including how they design a program that will lead to additional RE resources.
 - Other new RE sources that were not included in goal setting may be useful such as offshore wind, rooftop solar, landfill gas, anaerobic digesters, biomass.
- New RE development helps states with both mass-based and rate-based plans.
- **Mass-based:** Increased RE generation in a state, or RE generation outside the state that is used to meet in-state electricity demand, can mean that fossil fuel units operate less and emit less CO₂.
 - Additional RE support is possible with direct allowance allocations to RE, or with distributions of proceeds from auctions of allowances to RE generators.
 - That RE support can be offered to reward early action, separate from the CEIP.
- **Rate-based:** RE generator located in a rate-based state is issued ERCs by a rate-based state and may transfer ERCs to a power plant in any state with a compatible, linked rate-based emission trading program.
 - All RE that is developed and properly accounted for is available to use in meeting the goals or emission performance rates. The RE must:
 - Be incremental;
 - Be installed after 2012;
 - Meet all evaluation measurement and verification (EM&V) standards.
 - Deliverability requirements also apply for RE located in mass-based states.



How Does RE fit in the Clean Power Plan?





Basics - Mass-Based Emission Standards Approach

- Emission budget = total tons of carbon dioxide (CO₂) that can be emitted by covered emission sources.
 - Each allowance authorizes emission of a ton of CO₂.
- State emission budget is distributed to power plants or other entities in the form of allowances.
- Allowances can be bought, sold, or banked for future use.
 - The initial distribution of allowances is called allocation.
 - In state plan, state determines allocation approach.
- Some or all allowances can be distributed for a specific purpose.
 - Example: allowance set-asides to incent use of RE resources or help electricity ratepayers in the state.

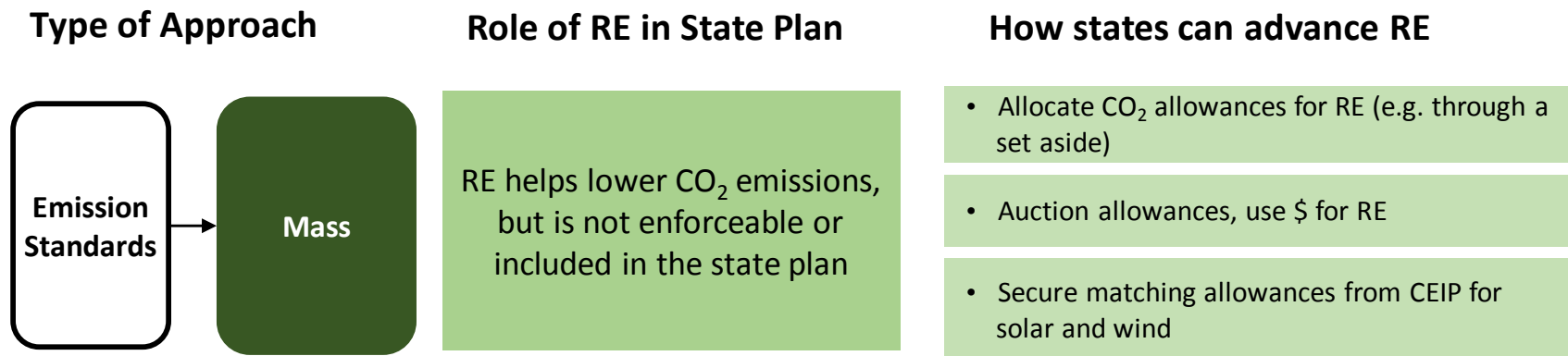


Basics - Rate-Based Emission Trading Approach

- In a rate-based emission trading program, power plants are assigned a rate of CO₂ emissions measured in pounds per megawatt hour (lbs/MWh)
- Compliance is achieved by lowering the unit's rate of emissions and/or using Emission Rate Credits (ERCs) representing clean MWhs
- ERCs may be used for compliance by affected EGUs subject to a rate-based state plan
- Interstate trading may occur through:
 - A multi-state plan that establishes a single multi-state rate emission standard; or
 - Individual, linked plans that apply emission standards equal to the subcategorized CO₂ emission performance rates



Mass-based emission standards approach

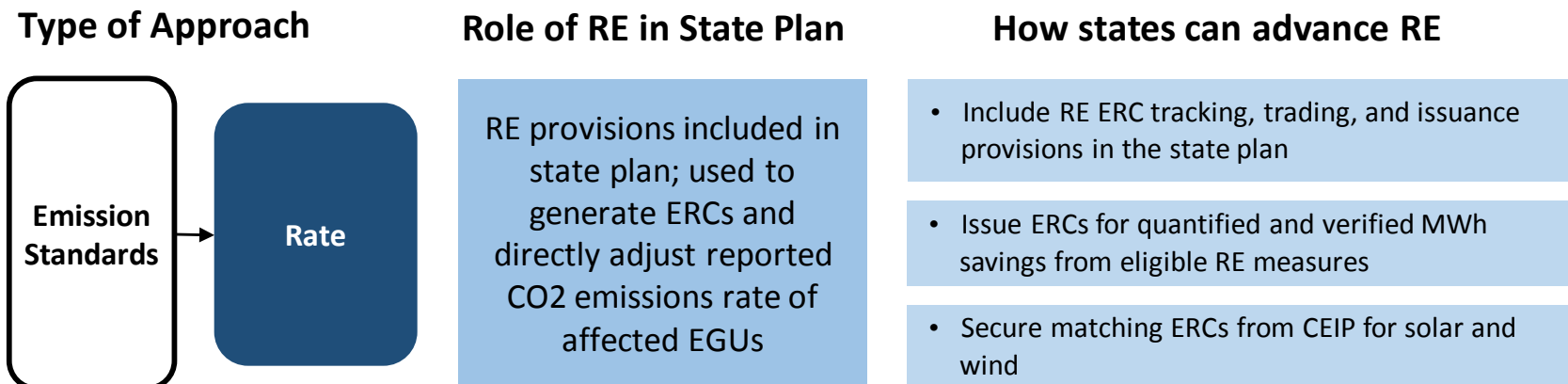


- Any RE measure achieving generation during the plan performance period, regardless of when it was installed, automatically “counts.”
 - RE can reduce utilization of affected EGUs and help meet the CO₂ emission cap.
- States also have many opportunities to advance RE as a complement to their state plan.
- States can also directly address RE in their plan, through allowance allocation as part of a state plan, including receipt of matching allowances from EPA through the Clean Energy Incentive Program (CEIP).
- EM&V only to the extent necessary for certain allowance set-asides – a state’s established emission budget or stack CO₂ emissions are the key criteria for showing that a state mass goals for affected EGUs has been met.

The final CPP is available at 80 FR 64661. In the event of any conflict between the provisions of the final rule and these slides, the final rule and requirements within are controlling.



Rate-Based Emission Standards Approach

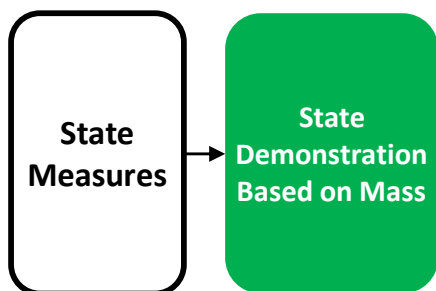


- Quantified and verified MWhs from eligible RE during the plan performance period (2022 and beyond) may be eligible for tradable Emission Rate Credits (ERCs), zero-emission MWh credits that can be used by affected EGUs to lower their reported CO2 emissions rate during the plan performance period.
 - RE eligible for ERCs includes measures implemented after 2012 that are achieving MWh savings during the compliance period.
 - RE must be grid-connected and can only receive ERCs from one rate-based state, though it does not need to be a rate-based state in which it is located or that it supplies.
- ERCs require EM&V for all MWhs; states must include ERC issuance and tracking provisions in state plans.
 - CPP proposed model rule includes presumptively approvable provisions for ERC issuance.
- States that opt into the Clean Energy Incentive Program may award early action ERCs to RE project providers that achieve MWh generation in 2020 and/or 2021.



State Measures Approach

Type of Approach



Role of RE in State Plan

RE provisions included as supporting material for state plan – enforceable under state law; State RE policies and measures can be used to help affected EGUs meet mass goal

How states can advance RE

- Implement state RE policies and programs (e.g., RPS) that are enforceable under state law, either to meet goal or in conjunction with federally enforceable limits emission limits for EGUs
- Secure matching allowances from CEIP for solar and wind

- States implement RE programs and requirements (e.g., RPS) to help affected EGUs meet their state mass CO₂ goal – either alone or in conjunction with federally enforceable limits on affected EGUs.
- RE programs and policies must be enforceable under state law but are not federally enforceable
- Requires a projection of RE impacts and EGU CO₂ emission performance, and an EM&V plan related to RE policies and programs that must be included as supporting material for the state plan
- State Measures plan must include federally enforceable backstop emission standards for affected EGUs in the event state measures do not achieve required CO₂ emission reductions



International Renewables

- States using the rate-based approach may be able to issue emission rate credits (ERCs) for international renewable energy (RE).
- To be considered, the international RE resources must:
 - Be installed after 2012;
 - Meet all requirements for ERC issuance, including evaluation, measurement and verification (EM&V) requirements;
 - Be connected to the U.S. grid;
 - Demonstrate delivery of power to the U.S. (e.g., have a power purchase agreement or other contract for delivery of the power with an entity in the U.S.).
- RE generation capacity outside the U.S. that existed prior to 2012 but was not exported to the U.S. is not considered new or incremental generation and, therefore, is not eligible for use in plans.



States and Tribes without EGUs Renewables - Participation

- RE projects located in States and on Tribal lands without affected EGUs may:
 - Participate in the trading provisions.
 - Apply to receive ERCs from States with rate-based plans, as long as projects meet requirements for eligibility.
- EPA is taking comment on certain tribal issues related to the proposed FP/MR.



Hydropower

- New hydropower can be used to meet state rate-based CO₂ goals or CO₂ emission performance rates.
 - New hydropower generating capacity installed after 2012.
 - Uprates at existing hydropower generating capacity installed after 2012.
- Existing hydropower is not included in goal setting.
- When setting goals, EPA adjusted the 2012 fossil fuel baseline upward for six states where hydropower generation was unusually high and well above historical averages because of large snow pack in 2012.
 - Idaho
 - Maine
 - Montana
 - Oregon
 - South Dakota
 - Washington



Biomass

- State plans can propose the use of “qualified” biomass resources that meet general requirements in the emission guidelines.
 - “Qualified biomass” is a biomass feedstock that is demonstrated as a method to control increases of CO₂ levels in the atmosphere
- Plans that propose to use biomass must include:
 - **Type:** what types of biomass are being proposed for use;
 - **Qualification:** how those proposed feedstocks or feedstock categories should be considered as qualified biomass; and
 - **Valuation:** explain the proposed valuation of biogenic CO₂ emissions.
- Resources for states considering the role of biomass in their plans
 - EPA’s revised Framework for Assessing Biogenic Carbon Dioxide for Stationary Sources and SAB peer review process related to this report.
 - <http://epa.gov/climatechange/ghgemissions/biogenic-emissions.html>
 - State and third-party programs concerning waste-derived feedstocks as well as sustainable forestry and agriculture feedstocks.



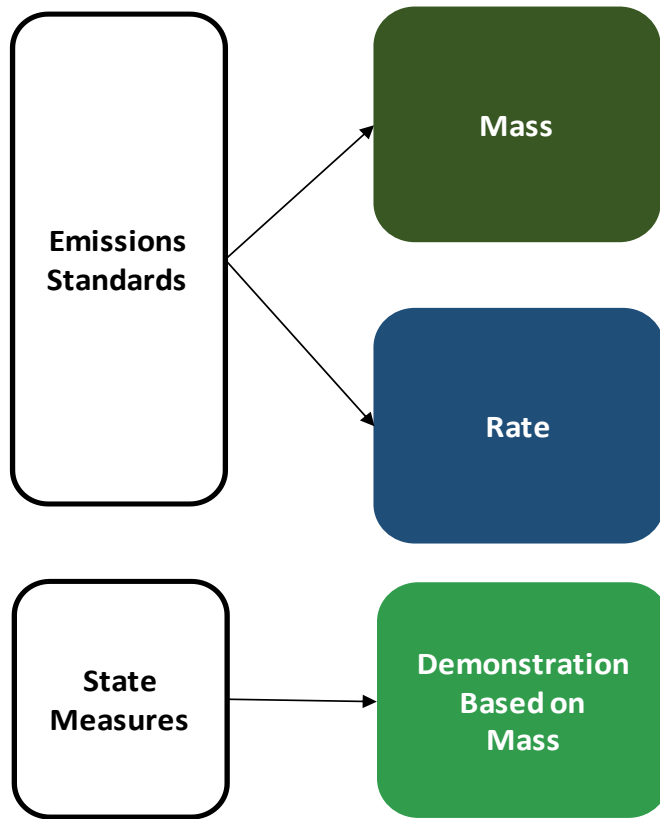
EM&V and the CPP

- **EM&V is important for a range of CO₂ reduction strategies**
 - The **final Clean Power Plan** includes basic requirements for evaluation, measurement, and verification (EM&V) that are applicable in certain state-plan circumstances [*see Section VIII.K.3*]
 - Presumptively approvable EM&V provisions in the **proposed federal plan & model trading rules** support the issuance of emission rate credits (ERCs) [*See Section IV.D.8*]
- **For RE, the FP/MR proposes that generation may be quantified using:**
 - A revenue quality meter that meets the applicable ANSI C–12 standard or equivalent
 - An inverter reading, in cases where RE generators are interconnected behind the customer meter
 - An estimate of generation, where the RE generating facility is 10 kW or less
 - Factors that account for avoided transmission and distribution (T&D) system losses, where generators are behind the customer meter



EM&V Applicability in the CPP

State Plan Approach



EM&V Applicability

- EM&V is generally not applicable
- EM&V should be implemented for set-aside allowances from RE implemented to meet the equivalence requirement addressing leakage
- EM&V is needed to secure matching allowances in the Clean Energy Incentive Program (CEIP) for solar and wind
- EM&V plans and reports are needed to support RE ERC tracking, trading, and issuance provisions
- EM&V is needed to secure ERCs in the CEIP for solar and wind
- EM&V is applicable for RE "state measures" (e.g., RPS); must be documented in supporting material of state plan
- EM&V is needed to secure matching allowances in the CEIP for solar and wind



Incentives for Taking Early Action on RE

- BSER is based on new emission reductions, consistent with the Clean Air Act. It does not explicitly credit actions taken prior to the rulemaking.
- States that made early investments in zero-emitting generation have a solid foundation for meeting their goals. States with greater RE generation are better positioned because they have a lower fossil generation base from which reductions are required.
- All RE that generates MWh during the plan performance period (2022-2030) helps states meet their CPP goals for affected EGUs, either as a formal part of a state's plan or as a complementary effort.
 - Under a **mass-based emission standard plan**, states can reward RE efforts, including for early action, through allowance allocation provisions.
 - Under a **rate-based emission standard plan**, eligible RE put in place after 2012 that achieves electricity generation during the compliance period may be issued Emission Rate Credits (ERCs).
- The **Clean Energy Incentive Program (CEIP)** provides additional incentives for solar, wind and low income EE investments that generate or save MWh in 2020 and/or 2021 under both rate-based and mass-based approaches.



Clean Energy Incentive Program

- The CPP's Clean Energy Incentive Program (CEIP) is designed to incentivize early investments that reduce end-use energy demand in low-income communities, and those that generate wind and solar power during 2020 and/or 2021.
- The CEIP is an optional, "matching fund" program states may choose to opt-in to with a non-binding indication in their Sept. 6, 2016 submittal.
- EPA will provide matching allowances or ERCs to states that participate in the CEIP, up to an amount equal to the equivalent of 300 million short tons of CO₂ emissions nationally. The match is larger for low-income EE projects, targeted at removing historic barriers to deployment of these measures.
 - To be eligible for allowances or ERCs under the CEIP a qualifying RE project must begin construction, and a qualifying low-income EE project must begin operation, following submittal of a final state plan to the EPA that contains requirements for CEIP participation.
- The CEIP will help ensure that momentum to no-carbon energy continues and give states a jumpstart on their compliance programs
- In the coming months, the EPA will issue a proposed rulemaking on the design and implementation details of the CEIP. This proposal will be open for public comment.



Information and Resources

After two years of unprecedented outreach, the EPA remains committed to engaging with all stakeholders as states implement the final Clean Power Plan.

- For more information and to access a copy of the rule, visit the **Clean Power Plan website**: <http://www2.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants>
 - For the **Clean Power Plan Toolbox** with resources to help states, tribes and territories develop plans, see: <http://www.epa.gov/cleanpowerplantoolbox>
 - For a factsheet on **Renewable Energy in the Clean Power Plan**, see: <http://www.epa.gov/cleanpowerplan/fact-sheet-renewable-energy-clean-power-plan>
 - Through graphics and interactive maps, the **Story Map** presents key information about the final Clean Power Plan. See: <http://www2.epa.gov/cleanpowerplan>
 - For community-specific information and engagement opportunities, see the **Clean Power Plan Community Page**: <http://www2.epa.gov/cleanpowerplan/clean-power-plan-community-page>
 - For more information on the **Clean Energy Incentive Program**, see the CEIP page: <http://www2.epa.gov/cleanpowerplan/clean-energy-incentive-program>
 - For a graphical and detailed walk through of the EGU category-specific CO₂ emission performance rate and state goals, see **State Goal Visualizer**: <http://www2.epa.gov/cleanpowerplantoolbox>
 - EPA provides **webinars** and **training** on CPP related topics at the air pollution control learning website. See: <http://www.apti-learn.net/lms/cpp/plan/>
- Federal programs and activities to support renewable energy and energy efficiency in low- and moderate-income communities: <https://www.whitehouse.gov/sites/default/files/low-income-and-energy-efficiency-programs.pdf>
- Federal initiative to increase solar access for all Americans: <https://www.whitehouse.gov/the-press-office/2015/07/07/fact-sheet-administration-announces-new-initiative-increase-solar-access>



Thank You and Discussion

