

Resources to Quantify Emission Impacts of State Energy Efficiency & Renewable Energy (EE/RE) Policies & Programs

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State and Local
Climate and Energy Program





Today's Briefing



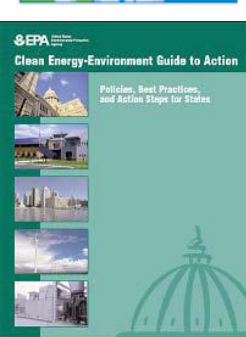
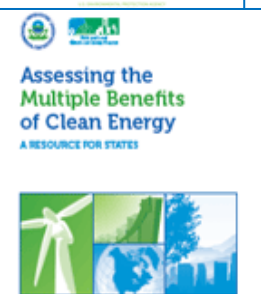
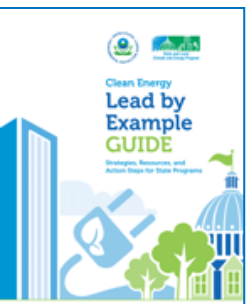
- Overview of working with states account for the benefits of EE/RE policies and programs
- The opportunity for states
- Roadmap for Incorporating EE/RE policies and Programs in SIPs
- Analysis and resources to quantify emission benefits of EE/RE policies and programs
 - EPA analysis and approach for state EE policies
 - Quantification tools and resources

U.S. EPA's State and Local Climate & Energy Program



- EPA's State and Local Climate and Energy Program has built expertise and collaborative relationships with states for 15+ years

- Help States advance cost-effective emission reductions through EE/RE policies and programs
- Demonstrate ways to include EE/RE in air regulator's compliance toolbox (Jointly with OAQPS and Regions)
- Develop resources and analyses that helps states link air/energy goals
- Advance training and pilots to further cross-agency collaboration, understanding and action (Jointly with OAQPS and Regions)
 - Energy/Air Workshop in Region 6 & NC (2012)
 - EE/RE Policy and AQ Training in VA (2012)
 - 3-State Pilot with MA, MD, NY (current)

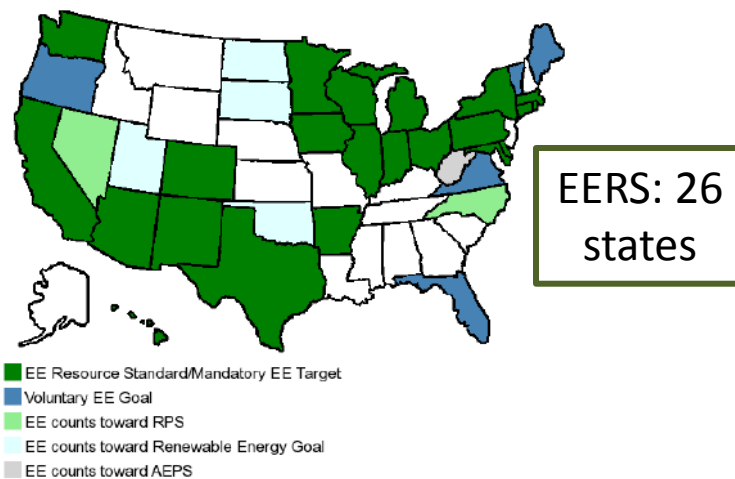


State Clean Energy Actions Advance Air Quality Benefits

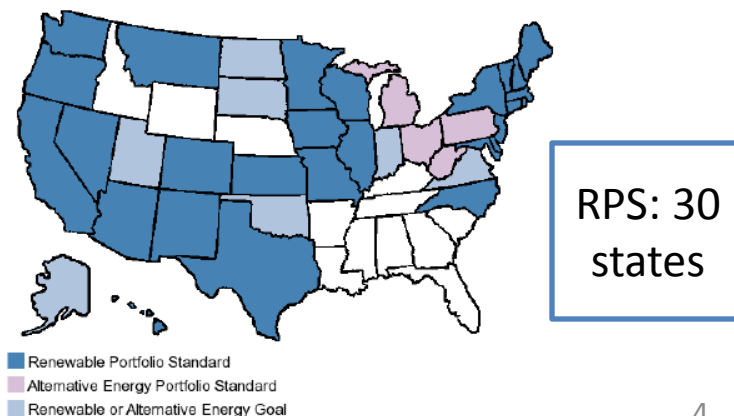
- State air regulators looking for new ways to lower emissions, improve air quality
- Meanwhile, Public Utility Commissions and State Energy Offices are advancing proven EE/RE policies and programs
 - Implementing DOE programs, such as SEP and Weatherization
 - Ratepayer funding for EE was ~\$7B in 2011 and is expected to rise to ~\$9.5B by 2025
 - Supportive utility regulations
- Opportunity to capture cost-effective emissions reductions



Energy Efficiency Standards and Targets



Renewable & Alternative Energy Portfolio Standards



Roadmap on Incorporating EE/RE



in State Implementation Plans



- Purpose: Navigate technical and policy barriers so states can account for emission benefits in SIPs
 - Clarify 2004 Guidance
 - Increase opportunities for using EE/RE
 - Cross-Agency OAR workgroup – Led by OAQPS, includes 7 regions
- Provides four pathways states can use to account for emission benefits of EE/RE (Jointly with OAQPS)
 - Baseline Emissions Projection Pathway
 - Control Strategy Pathway
 - Emerging/Voluntary measures Pathway
 - Weight of evidence Pathway



Analysis and Resources to Quantify Emissions

- Analysis and quantification resources
 - Baseline analysis and analytical steps to estimate existing EE policies for baseline emissions projections
 - Projected energy savings of existing state EE policies
 - Draft quantification tools (peer review complete)
 - Power Plant Emissions Calculator (P-PEC)
 - Employing the Capacity Factor Approach
 - AVoided Emissions and geneRation Tool (AVERT)
 - Employing the Hourly Emissions Rate Approach
 - Online training on electric energy system and quantifying EE/RE policies & programs





Baseline Analysis and Approach



- Purpose
 - Recognize state leadership and action
 - Send a signal that accounting for on-the-books EE policies in baseline emissions forecasts is a viable SIP pathway
 - Demonstrate emission impacts of existing state EE policies
 - Lower electric demand and future baseline emissions means cost savings to attain the NAAQS
 - Describe an approach and steps that states can implement

For more information visit:

<http://www.epa.gov/statelocalclimate/state/statepolicies.html>

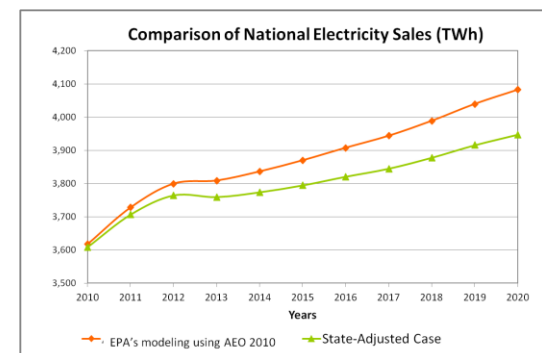


Baseline Analysis and Approach

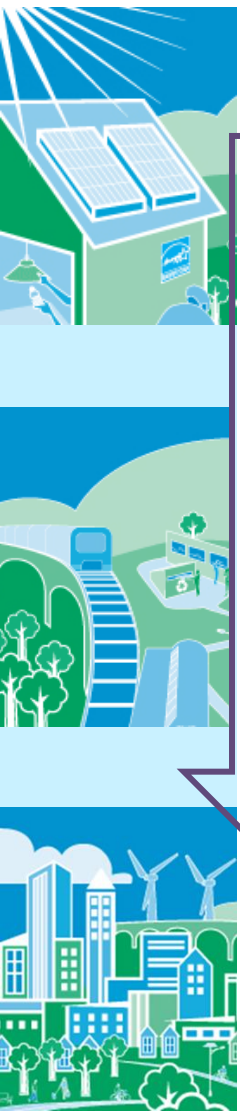
Analysis of projected emissions impacts of existing EE policies

- Background

- Recognized missed opportunities to reflect state policies not currently in EIA's AEO 2010 projections and, hence, EPA's baseline forecast
 - AEO accounts for some but not all EE/RE programs and policies
- Established straightforward approach to capture EE policy impacts on energy saved (MWhs)
 - Existing EE policies represent 3% demand reduction
- Provide emission projections of an illustrative EE baseline analysis



Estimating the Emission Benefits of EE/RE Policies and Programs



Sophistication increases

Four Emission Quantification Approaches

| Approach | Available Tools |
|---------------------------------------|--|
| eGrid subregion non-baseload approach | Power Plant Profiler and Portfolio Manager |
| Capacity factor approach | P-PEC (Draft) |
| Reported Hourly emissions approach | AVERT (in progress) |
| Energy modeling approach | IPM, Ventyx, MARKAL, NE-MARKAL, |

For more information visit: <http://epa.gov/airquality/eere/pdfs/appendixl.pdf>



Choosing a Quantification Approach

- There are several key questions that can help narrow your options as you select an approach:
 - What is the purpose of the analysis?
 - What types of emissions are you interested in?
 - What scale do you care about?
 - How much time and resources do you have?
- Match your answers to the approaches.

| Key Considerations When Selecting an Approach | | Typical Approaches | | | |
|---|--|--|---|---|--|
| | | eGRID subregion nonbaseload | EGU Capacity Factor | Hourly Emissions | Energy Modeling |
| PURPOSE | Preliminary Analysis | * | * | | |
| | Voluntary Programs | * | * | | |
| | General benefits Info | * | * | | |
| | Regulation or statutory requirement | | ? | * | * |
| EMISSIONS | Emissions of interest | CO ₂ , NO _x , SO ₂ , CH ₄ , N ₂ O | NO _x , SO ₂ , CO ₂ | NO _x , SO ₂ , CO ₂ | NO _x , SO ₂ , CO ₂ , varies |
| SCALE | Geographical: State vs. Regional import/export | eGRID subregion partially addressed | | | |
| | Source Aggregation | boiler, generator, plant | plant | emission unit (boiler) | emission unit (boiler) |
| | Temporal - length of time; historical vs. forecasted | annual & ozone season (NO _x) historical | annual & ozone season (NO _x) historical | hourly historical | annual, ozone season NO _x , hourly forecasted |
| RESOURCES | Time | low | low | medium | high |
| | Money | low | low | medium | high |
| | Staff expertise | low | low | medium | high |

Note: “?” indicates pending peer review



Key Considerations when quantifying EE/RE emission impacts



- Understand baseline parameters to avoid double counting impacts
- Work with energy regulators in states to get impacts for on-the-books EE/RE policies & programs
- Focus on larger EE/RE policy impacts or bundle smaller EE/RE programs
- Analysis should cover a region – similar to grid operations



Thank you



For emissions quantification

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For the Roadmap and SIP related questions

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Additional Resources:

Online training on electric sector

<http://www.epa.gov/apti/video/ElectricEnergy/ElectricEnergy0212.html>

Online module on quantifying emissions of EE/RE Policies

<http://www.epa.gov/apti/video/ElectricEnergy/Module%20%20-%20Part%203/mod4pt3.swf>