ACEEE
American Council for an Energy-Efficient Economy

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Van Ness Feldman LLP

EPA's New Proposed GHG Rule: Role for Energy Efficiency

Webinar
June 9, 2014
3:00 – 4:00 p.m. EDT

First, logistics....

- **Join the audio conference:**

  Dial a phone number and enter access code, or connect via internet.

  By phone: United States **+1.213.226.1066** Access Code **814-711-097#**

  Other international numbers available

  By computer via internet:
  Join the meeting, click the phone icon and select 'Call via internet'. A small download might be required.

- **Other than presenters, participants will be in listen only mode.**
- **Questions can be asked via the webinar chat feature.**

- **Slides and recording will be posted after the webinar.**

What we will cover

- Overview of the EPA 111(d) proposal.
  - Kyle Danish, Partner, Van Ness Feldman LLP
- How energy efficiency can be included in state plans.
  - Rodney Sobin, Director of Research & Regulatory Affairs, Alliance to Save Energy
- Energy efficiency opportunities and potential impacts.
  - Sara Hayes, Senior Manager and Researcher, American Council for an Energy-Efficient Economy

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Overview of EPA's "Clean Power Plan" Proposed Rule

ACEEE / ASE / VNF Briefing

Kyle Danish

June 9, 2014

Clean Power Plan Proposed Rule

- Projected to reduce power sector CO2 emissions 30% below 2005 levels by 2030
- Implementation begins in 2020
- Architecture:
  - State-specific emission rate goals
  - State compliance plans
- Significant role for end-use energy efficiency

Timeline

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Plan Architecture / Role of EE

State-specific emission rate goals

State compliance plans

How State-Specific Goals are Formulated

- Identify emissions rate (lbs CO2/MWh) for power sector in 2012
- Apply "building blocks"
  1. Assume 6% improvement in coal plant heat rate
  2. Assume utilization of gas plants up to 70%, with corresponding decrease in coal plant utilization
  3. Assume renewable generation at level of regional average RPS, also adjustment for "at-risk" and new nuclear
  4. *Increase state end-use energy efforts to ramp up to 1.5 % annual increase starting in 2017 through 2020-2029*
- Result: state-specific emission rate goal
  - Significant state to state variation

State Compliance Plans

- States submit plans for meeting goal
  - Plans due in 2016 with possible extensions to 2018
- EPA must approve plan
  - Approved plan becomes federally enforceable
- States have discretion in designing plans
  - Not required to use “building block” policies
  - Can have rate limit converted to “mass” limit on emissions
  - Can adopt multi-state plans
- EPA rule provides guidance on design of plans

Guidance on EE Measures in State Plans

- Determining energy savings from EE action
  - E&MV protocols
- Life of energy savings from EE action
  - Assumed to generate 10 years of savings
- Timing of EE action
  - Actions implemented after rule proposal count – even if pursuant to pre-existing state program
- Options for applying energy savings to the state emission rate
  - Reduction in tons (numerator approach)
  - Increase in MWhs (denominator approach)
- Enforcement
  - EE measures in state plans may become *federally* enforceable
- Possible adjustment for high import states?

What Happening Now?

- Analysis of proposed rule, state goals
- Rulemaking comments due 120 days after publication in Federal Register
- Possible changes in final version

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Including Energy Efficiency in State 111(d) Plans

Rodney Sobin
Director of Research & Regulatory Affairs
Alliance to Save Energy

EPA's New Proposed GHG Rule: Role for Energy Efficiency
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Incorporating EE in 111(d) Plans

- Introduction
- State Plan Components
- State Plan Pathways
- Enforceability Considerations
- EE Incorporation Under Rate-based Approach
- Evaluation, Measurement & Verification (EM&V)
- Emissions Quantification
- Interstate Considerations
- Resources

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Introduction

- Proposal offers much state flexibility
  - Many possible options, scenarios
- Recognizes (encourages) end-use EE
- Complicated issues, many new to air regulators
- Preamble asks for comment on many issues

So, many questions will be with us for some time.

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State Plan Components

1. Affected entities (not only electrical generating units--EGUs)
2. Plan approach and geographic scope
3. State emission performance level, rate- or mass-based
4. Plan projected to meet required emissions goals
5. Milestones
6. Corrective actions for shortfalls
7. Identify emissions standards and other measures
8. Measures are quantifiable, non-duplicative, permanent, verifiable, enforceable
9. Monitoring, recordkeeping and reporting
10. State reporting
11. State hearing
12. Supporting materials

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State Plan Pathways

Four pathways—all can include EE

- Rate-based emissions limit applied to EGUs
  - EE credited to EGUs as emission rate adjustment
  - Tradable credits or state assigns credit
  - EE measures need to enforceable & need EM&V

- Mass-based emissions limit applied to EGUs
  - CO_2 mass limit or budget on individual or group of EGUs
  - EE helps cost-effectively meet CO_2 limit but not "credited" per se
  - EE as "complementary" to enforceable state plan
- Portfolio approaches
  - Can include direct EGU limit and (enforceable) indirect measures
  - **State-driven:** multiple entities may have enforceable obligations
  - **Utility-driven:** suite of measures enforceable on utilities
    - More suitable in states with vertically integrated utilities
  - Rate- or mass-basis can be used

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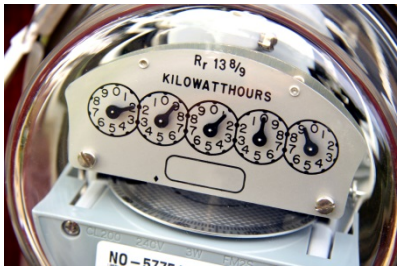
Enforceability Considerations

- State plan must
  - Identify entities responsible for compliance & other obligations
  - Include mechanisms for showing compliance; obligations met
  - Show legal mechanisms to address non-compliance
- Could have multiple compliance entities
  - EGU owners (utility, non-utility)
  - Local distribution utilities
  - Third party program administrators (e.g., Energy Trust of OR)
  - State agencies and authorities
- Issues
  - Differing regulation of investor-owned, co-op, public power utilities
  - EE programs with alternative compliance payment don't assure emission reductions
  - PUC financial penalties don't assure emissions reductions
  - Multistate plan complications



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EE Under Rate-based Approach

- EE can be used to "adjust" emission rates in lb/MWh
  - Add MWh saved to denominator
  - Or subtract avoided CO_2 from numerator

- Can be applied to individual or group of EGUs
- Can be tradable credit or state-apportioned adjustment
- NRDC approach to credit savings at target rate
  - E.g., MWh saved in state with 1500 lb/MWh target credited as 1500 lb CO_2 avoided
- Considerations
  - Rate-based approach needs more EM&V, emission quantification
  - Some CO_2 avoided may be from non-affected units
    - Simple-cycle gas peakers, new EGUs under 111(b) NSPS

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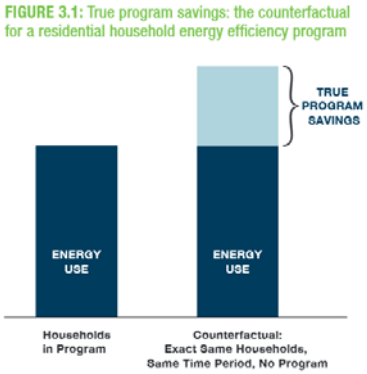
Evaluation, Measurement and Verification

- Estimate energy savings
- State plan should include EM&V plan
- Varied approaches
  - Meters, bill analysis, surveys, models, deemed savings
- Almost every state has some EM&V in place
- Considerations
  - Time-of-use/savings (affects emissions quantification)
  - Balancing cost and accuracy
  - Variations in assumptions, methodologies, bases
    - Measure life, net vs. gross savings, baselines
  - Some EE easier to measure than others
- Methods and technologies improving
- Models, protocols, resources available



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Evaluation, Measurement and Verification

- EM&V role may vary by state 111(d) approach
  - Rate-based: important to quantify savings & translate to emissions rate
  - Mass-based: compliance measured by CO_2 at stacks
  - **But** EM&V may be important for EE resource standards (EERS) or other policy to attribute savings, credits

- Example 1: Rate-based with broad EE market participation.
  - Industry, energy service companies, utilities, others sell EE credits for compliance; need EM&V to show credible 0 lb/MWh EE supplied.*

    * May be non-zero for some CHP or other options.

- Example 2: Mass-based cap program (e.g., RGGI).
  - Generators need allowances to cover emissions; no EE credit for CO_2 per se
  - But may use EM&V to credit under EERS, etc.; needed to achieve reductions

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Emissions Quantification

- Translate energy savings to avoided emissions
- Average vs. marginal emissions rates (marginal better)
- AVoided Emissions and geneRation Tool (AVERT)
  - Good tool for near-term; easy to use; some limitations
- Dispatch modeling
  - More sophisticated; cost, expertise required
- Operational vs. build margin
  - Large amounts of EE or RE can affect EGU construction & retirement
  - Operational marginal models may not capture this

↔

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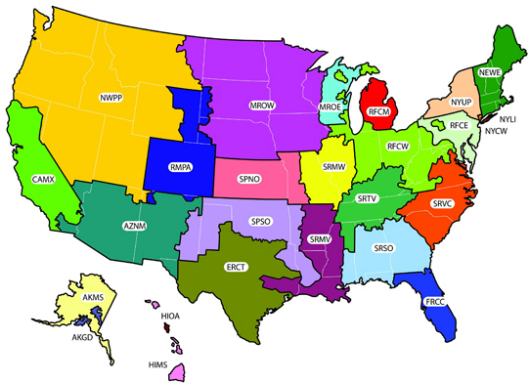
Interstate Considerations

- Power flows across state lines; energy savings in one state can affect generation and emissions in another
  - AVERT, dispatch models useful
- EPA discusses several approaches for EE
  - State claims reductions from in-state EGUs only
  - State that implements measure takes credit for avoided emissions anywhere
  - Several multi-state/regional options
    - Regional market; attribution by formula; joint demonstration of compliance



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Interstate Considerations

- 111(d) preamble proposes (and asks for comment on):
  - State should only count CO_2 reductions in the state resulting from EE implemented in that state
  - States in multi-state plans could distribute reductions among participating states
  - States in multi-state plans could jointly demonstrate emissions performance in contiguous grid region without attributing to individual states

- Yet, EPA proposes allowing states to count emissions reductions across states due to renewables in existing RPSs.

So, many questions remain.

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Resources

- Clean Power Plan Proposed Rule (Sec. VIII State Plans)

  http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule

- Technical Support Documents: State Plan Considerations & Projecting EGU CO_2 Emission Performance in State Plans

  http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-technical-documents

- Clean Power Plan Toolbox for States

  http://www2.epa.gov/cleanpowerplantoolbox

- EPA Roadmap for Incorporating EE/RE Policies and Programs in State Implementation Plans

  http://www.epa.gov/statelocalclimate/documents/pdf/overview_paper_4-28-2011.pdf

- SEE Action Network EM&V Resource Portal

  http://www1.eere.energy.gov/seeaction/emv_resource_portal.html

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What Role Can End-use Energy Efficiency Play?

Sara Hayes
Senior Manager and Researcher
June 9, 2014

The American Council for an Energy-Efficient Economy (ACEEE)

- ACEEE is a nonprofit 501(c)(3) that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments & behaviors
- Nearly 50 staff based in Washington, D.C.
- Focus on end-use efficiency in industry, buildings, utilities & transportation
- Other research in economic analysis; behavior; national, state, & local policy
- Funding:
  - Foundation Grants (52%)
  - Contract Work & Gov. Grants (20%)
  - Conferences and Publications (20%)
  - Contributions and Other (8%)

Why is EE the preferred path?

- Low cost
  - See: *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs*, Maggie Molina
- Lots of it
  - See: Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution, Hayes, et. al
- Can be deployed in the rule's timeframe
  - See: *Energy Efficiency Resource Standards: A New Progress Report on State Experience,* Annie Downs and Celia Cui
- Multiple pollutants, T&D benefits, the list goes on.
  - See: *Recognizing the Full Value of Energy Efficiency*, Jim Lazar and Ken Colburn

EE in the proposal

1.5% Energy Efficiency Resource Standard (EERS) is assumed and used to set individual state targets.

- Starts at 2012 levels and increases 0.2% per year

Status of State EERS Targets

Approximate annual savings target in 2013	Number of states	States
2% or greater	5	Massachusetts, Arizona, Rhode Island, New York, Vermont
1.5% - 1.99%	6	Illinois, Maryland, Maine, Minnesota, Colorado, Indiana*
1.0% - 1.49%	9	Connecticut, Iowa, Oregon, Washington, Hawaii, Ohio*, New Mexico, Michigan
0.5% - 0.99%	4	California, Wisconsin, Pennsylvania, North Carolina, Arkansas

Notes: Nevada has a savings target of 0.2% and Texas has a target of 0.1%.
*Indiana and Ohio have taken recent action to threaten or eliminate their EERSs
Source: http://www.aceee.org/sites/default/files/publications/researchreports/e13k.pdf

What about the rest?

- There are many more opportunities for EE savings
  - Combined heat and power
  - Building codes
  - State-level appliance standards
  - Private EE providers
  - The world is your oyster!

- Additional clarity needed on how these would be credited, but flexibility seems to be the intent here.

Our analysis

- 1.5% annual energy savings goal
- Combined heat and power
- Building energy codes
- Appliance standards

Starts in 2016, ends in 2030....

What happens?

Costs, Jobs and Savings in 2030

- Costs are LESS than savings
  - $47 billion in EE investments
  - $95 billion in savings
- 600 million tons of CO_2 avoided
- 611,000 new jobs

A SNAPSHOT OF THE U.S. IN 2030

Following the current energy path will have devastating economic, environmental, and health impacts. Enacting energy efficiency policies would avoid 600 million tons of carbon dioxide emissions.

CURRENT ENERGY PATH

An additional 494 power plants would be maintained

NOx

527,000 tons* of additional nitrogen oxide pollution

SO2

980,000 tons* of additional sulfur dioxide pollution

CO2

600 million tons* of additional carbon dioxide pollution

Transmission and distribution cost increases

Erosion of energy grid reliability

$95 billion in electricity generation costs

*i.e., the amount of pollution that would be avoided by choosing the energy efficiency scenario

ENERGY EFFICIENCY SCENARIO

Energy efficiency policies would save 925 million MWh of electricity

Environmental impacts:

26% reduction in carbon emissions relative to 2012

25% reduction in power demand relative to 2012

Economic impacts:

611,000 new jobs created

$17.2 billion increase in GDP in 2030

$47 billion in energy efficiency investments

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Are there winners and losers?

Nationally we clearly win, but what about individual states?

- EE is available everywhere.
- Everyone's new *measures* seem to be creditable.
- Some states have been implementing for decades while others are just beginning.
  - Some have administrative aspects worked out
  - Others have lots of untapped opportunities and can benefit from the lessons learned by early adopters

Every state saves substantially

Percentage of electricity savings relative to 2012 consumption, by census region

Region	Total (all four policies)
New England	30%
Middle Atlantic	28%
South Atlantic	24%
East South Central	23%
West South Central	24%
East North Central	22%
West North Central	22%
Mountain	30%
Pacific	27%

Next steps/Takeaways

We have some areas where we need additional clarity

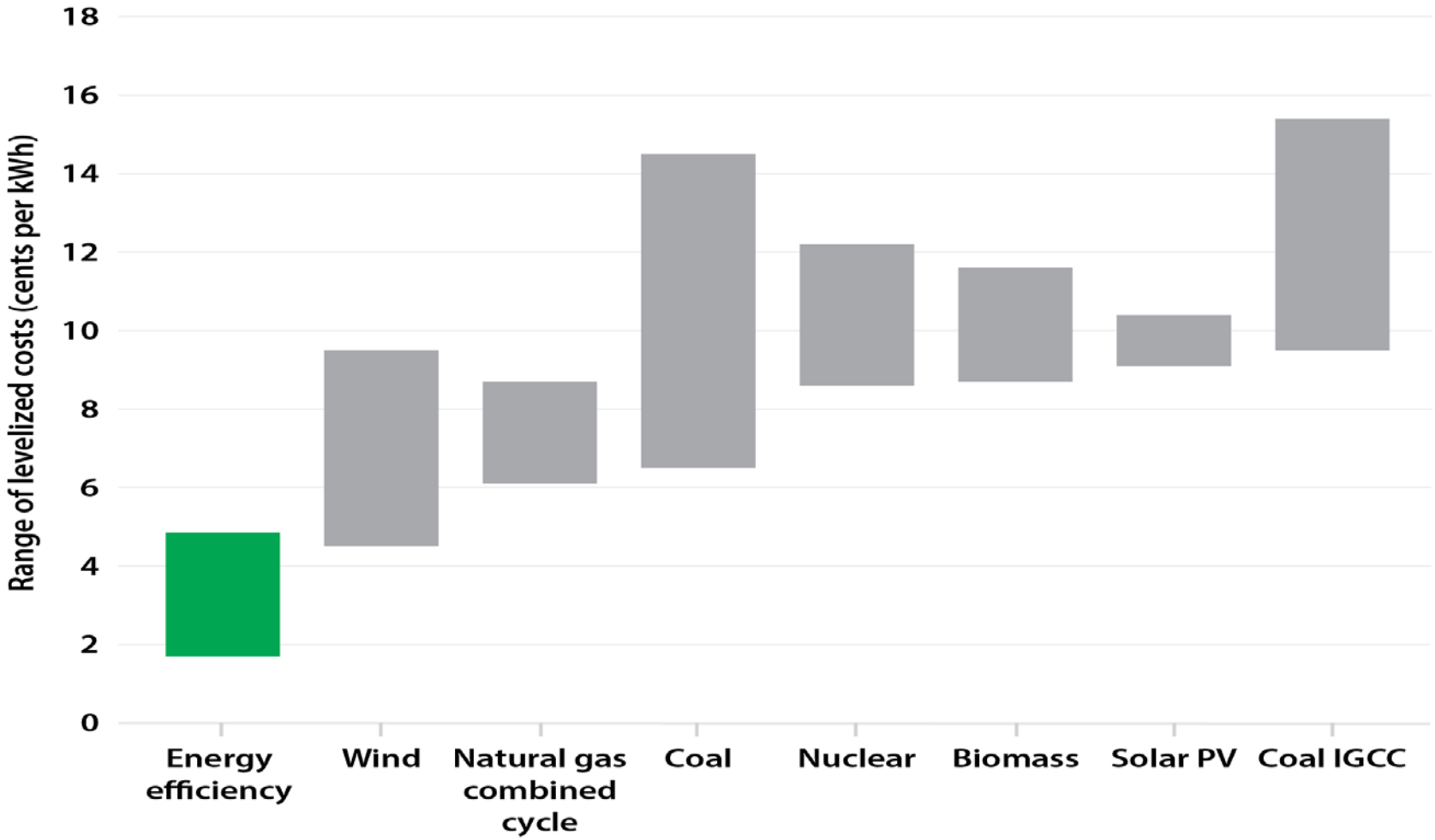
- Need clear guidance on the role of a variety of EE measures (building codes, CHP)
- Need clear guidance on acceptable EM&V (Feb document on NAAQS indicates deference, but language alluding to more guidance in the rulemaking docs: See: http://epa.gov/statelocalclimate/state/statepolicies.html#projecting)

Acting in spite of uncertainty

- States should look at identifying the EE potential within their borders
- Choose EE investments with long-term savings and adopt a “balanced portfolio”
- Choose EE that fits with past EPA guidance

States need a way to compare the cost of different compliance options

Levelized electricity resource costs



Source: Energy efficiency data represent the results from Molina 2014 for utility program costs (range of four-year averages for 2009-2012); supply costs are from Lazard 2013.

Thank you!

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