



RAP

Energy solutions
for a changing world

Trading Under the Clean Power Plan

Clean Energy Sources Technical Advisory Committee to
Nevada's New Energy Industry Task Force
Carson City, Nevada

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- The Regulatory Assistance Project (RAP) is a global, non-profit team of energy experts, mostly veteran regulators, advising current regulators on the long-term economic and environmental sustainability of the power and natural gas sectors. (www.raonline.org)



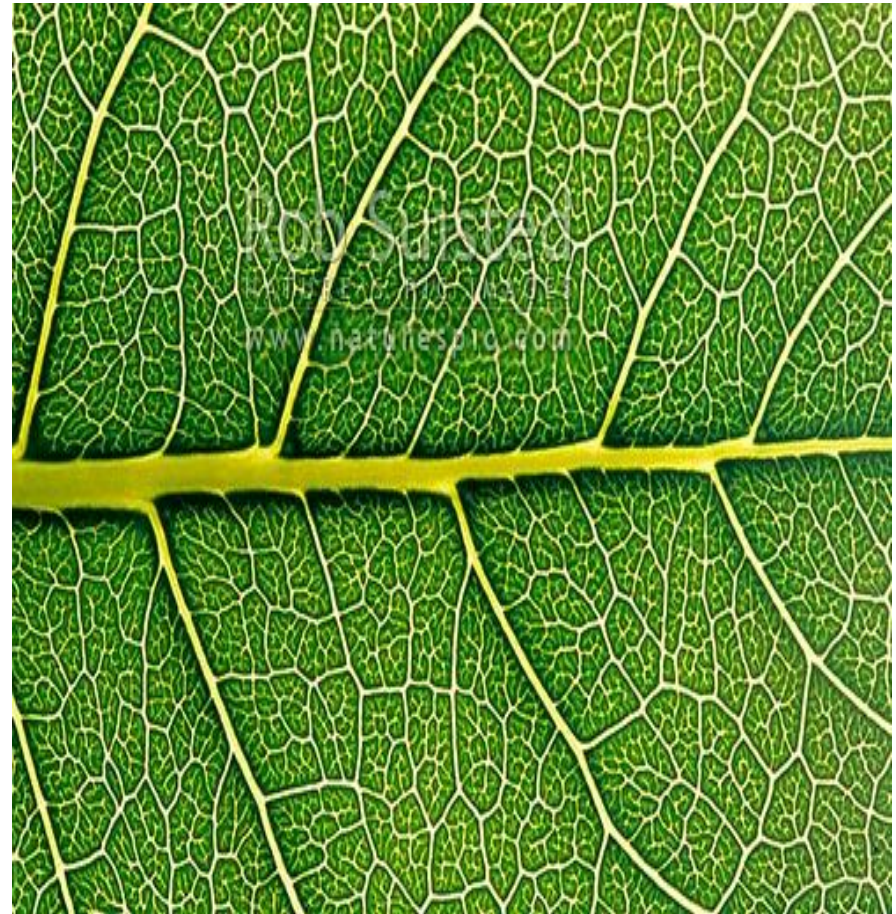
- David Farnsworth has been with RAP since 2008. He served as a hearing officer and staff attorney with the Vermont Public Service Board from 1995 to 2008. From 2003 to 2008, he was a member of the Regional Greenhouse Gas Initiative (RGGI) Staff Working Group.

Outline

- Introduction—CPP's Structure
- CPP Goals—Rate/Mass
- Carbon Reduction Policies
- Rationale for Working Regionally
- Questions to Ask

CPP – Observations about Structure

- **Fed/State Relationship:**
 - EPA sets standards
 - States develop plans to comply
 - EPA reviews and
 - Approves, or if inadequate,
 - Imposes federal plan



CPP Goals – Set Out in Two Ways

- **Rate-Based**
- **Mass-Based**

A Weight Loss Analogy

- **Rate-Based**
Reduce calories from 1,000 to 750 per meal
- **Mass-Based**
Lose 10 pounds by December 31st

Nevada's CPP CO₂ Goals

Rate-based emissions (lbs CO ₂ /net MWh)	2012 Adjusted Baseline Emissions Rate— 1,102	2030 Final Goal— 855
Mass-based emissions (short tons CO ₂)	2012 Mass-- 15,536,730	2030 Final Goal-- 13,523,584

Rate-Based Goal

“Adjusted Output-Weighted
Average CO₂ Emission Rates”

TOTAL CO₂ EMISSIONS
from Coal-, Oil- & Gas-fired Steam,
Natural Gas Combined Cycle
& “Other” Units (Affected EGUs)

Lbs

TOTAL NET ENERGY OUTPUT
From Affected EGUs
+ Renewables + New Nuclear + 6% at-risk
nuclear + cumulative annual EE savings

MWh

Courtesy Franz Litz, GPI

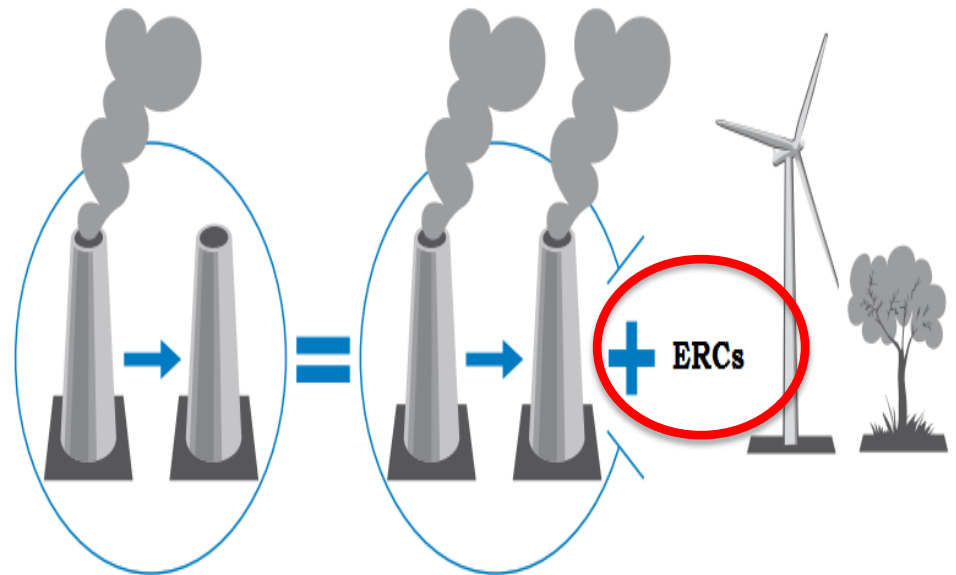
Rate-Based Compliance – W/Trading

$$\text{Emissions Rate} = \frac{\text{Emissions (lbs)}}{\text{Output (MWh)} + \text{ERCs (MWh)}}$$

- Emission Rate Credit = ERC is a **tradable instrument** used only for compliance with **rate**-based standards
- ERC represents 1 MWh of actual energy generated **or saved** with zero associated CO₂ emissions.

How Does the ERC Work?

- By re-dispatching electricity production
- From higher emitting plants to lower or zero emissions plants that earn ERCs
- A facility can demonstrate that – across a blend of resources – it achieves the emissions rate



Mass-Based Goal

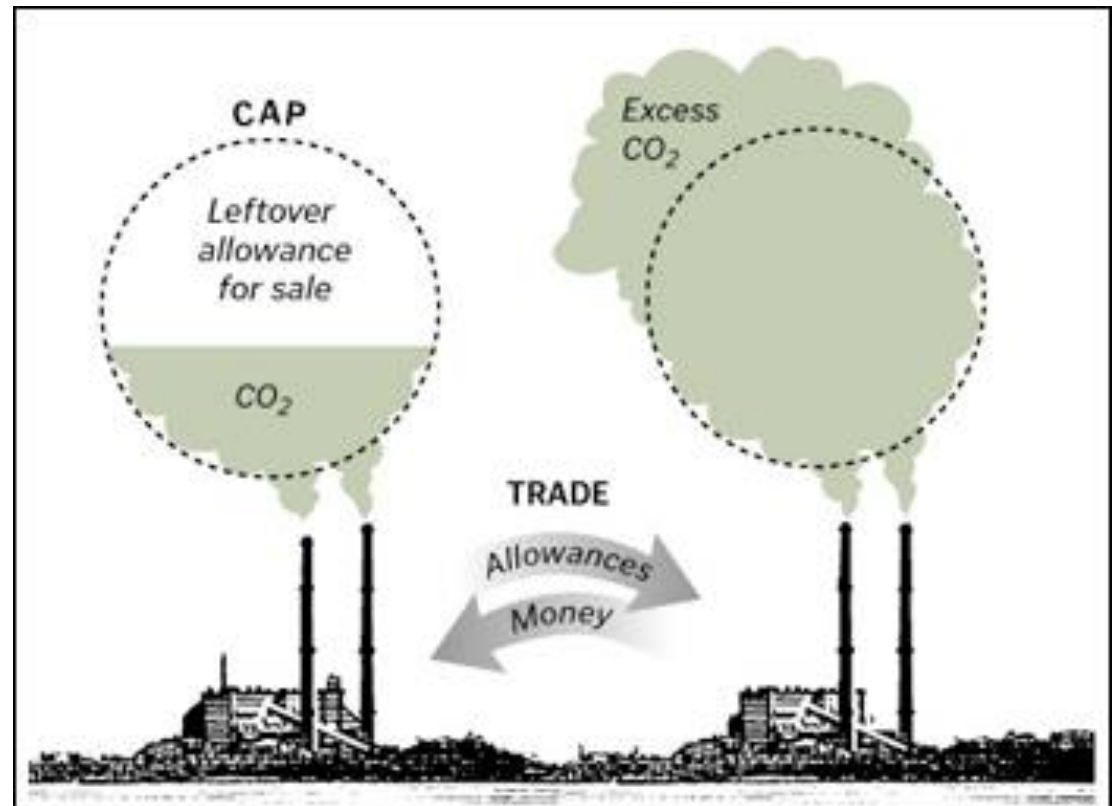
Tons per year

Mass-Based Compliance

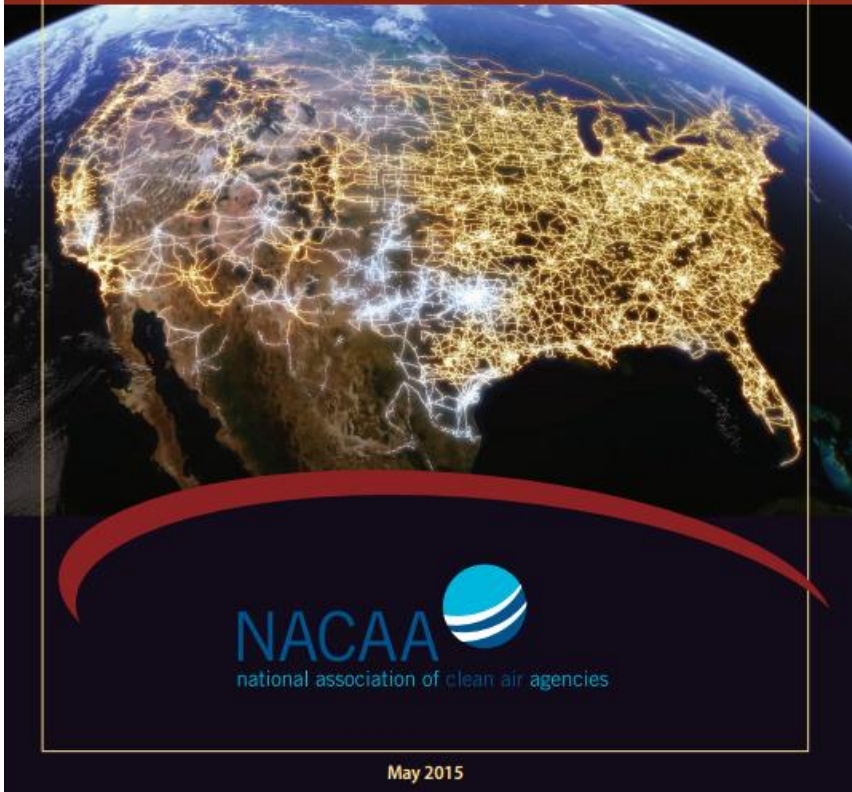
- State creates **tradable** emissions **allowances** equal in number to the states emissions “budget”
- Emitters must surrender **one allowance** for **one ton** of emissions
- Allowances are distributed in advance through an allocation, an auction, or a sale

Mass-Based Compliance with Trading

- Sold or traded as part of a larger market-based system



**Implementing
EPA's Clean Power Plan:
A Menu of Options**



National Association of Clean Air Agencies (NACAA)

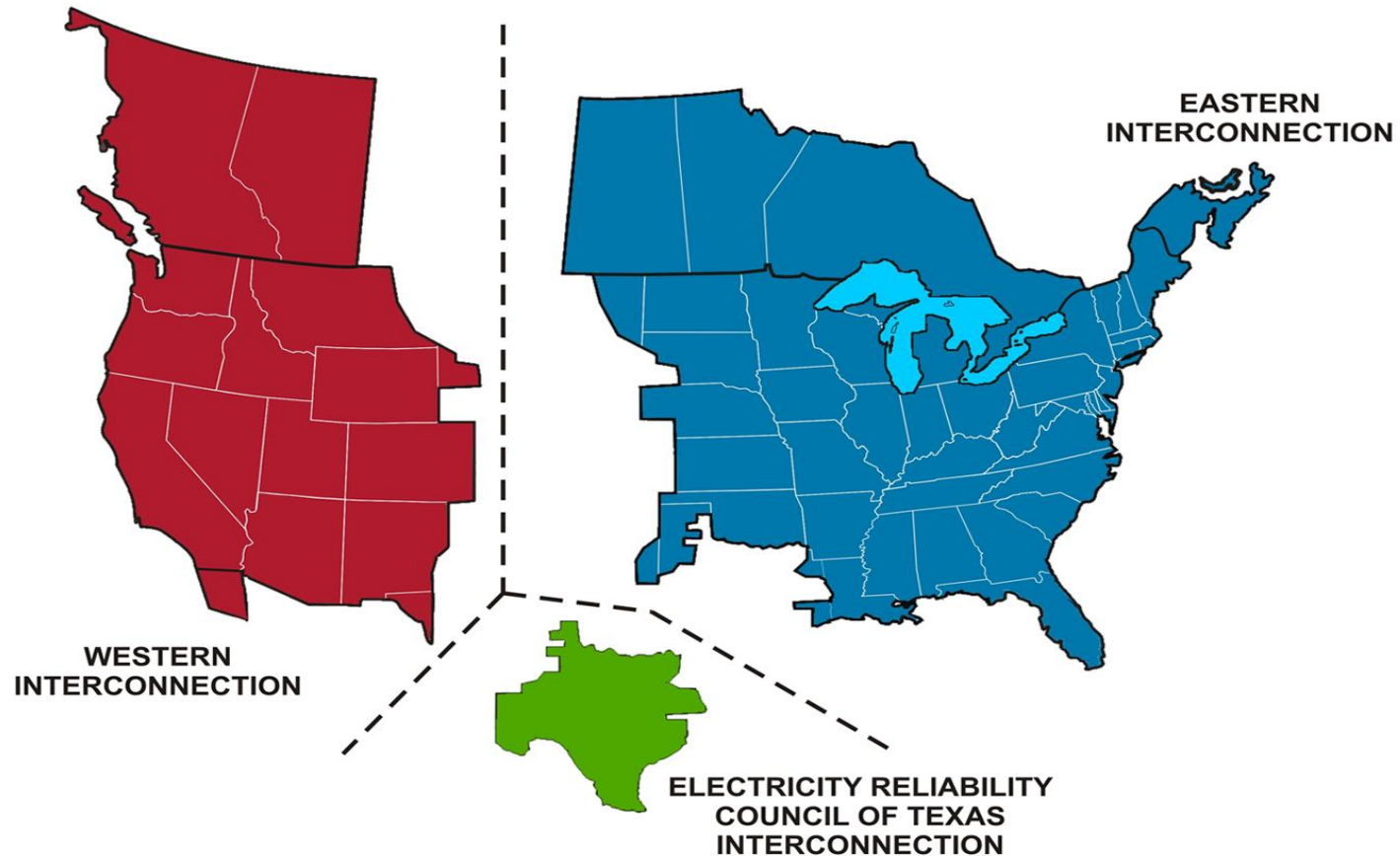
“Menu of Options”

A 465-page summary of technologies, programs and policies to reduce greenhouse gas emissions from the electric power sector.

[http://www.4cleanair.org/NACAA Menu of Options](http://www.4cleanair.org/NACAA_Menu_of_Options)

CPP: State-Based, But Designed to Work Regionally

North American Electric Reliability Corporation Interconnections



Rationale for a Multi-State Approach

- CPP attempts to be responsive to regional interconnectedness of power grid:
 - System reliability, e.g., resource pooling
 - Environmental compliance cost, e.g., Acid Rain Program
- Ask:
 - Will a state plan that attempts to coordinate regionally be able to better ensure reliability and lower cost ?
 - Will regional programs be easier for EPA to review/approve?

ISO/RTO Council (IRC)*

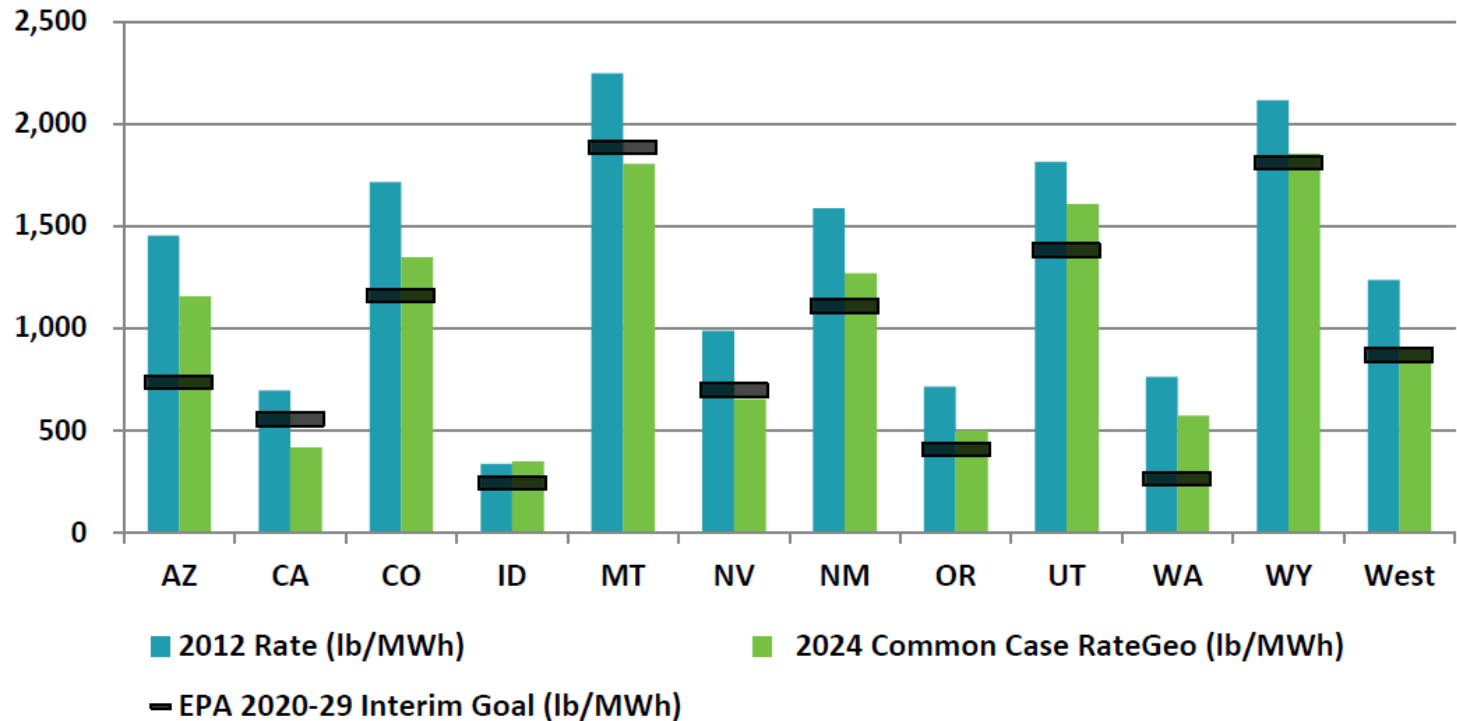
Although [CPP] contemplates individual state controls on GHG emissions, the nature of GHG is such that the location of specific emission sources is not nearly as relevant as the overall nationwide (if not worldwide) reduction in GHG emissions. As a result, coordinated regulatory programs among states can help to ensure that the efficiencies of least cost compliance across a regional, if not national, footprint can be maximized.

*Alberta Electric System Operator (“AESO”), the California Independent System Operator, Inc. (“CAISO”), Electric Reliability Council of Texas, Inc. (“ERCOT”), the Independent Electricity System Operator of Ontario, Inc., (“IESO”), ISO New England, Inc. (“ISO-NE”), Midcontinent Independent System Operator, Inc., (“MISO”), New York Independent System Operator, Inc. (“NYISO”), PJM Interconnection, L.L.C. (“PJM”), and Southwest Power Pool, Inc. (“SPP”).

EPA CO₂ RULE – ISO/RTO COUNCIL RELIABILITY SAFETY VALVE AND REGIONAL COMPLIANCE MEASUREMENT AND PROPOSALS, http://www.isorto.org/Documents/Report/20140128_IRCProposal-ReliabilitySafetyValve-RegionalComplianceMeasurement_EPA-Co2Rule.pdf

WECC Study

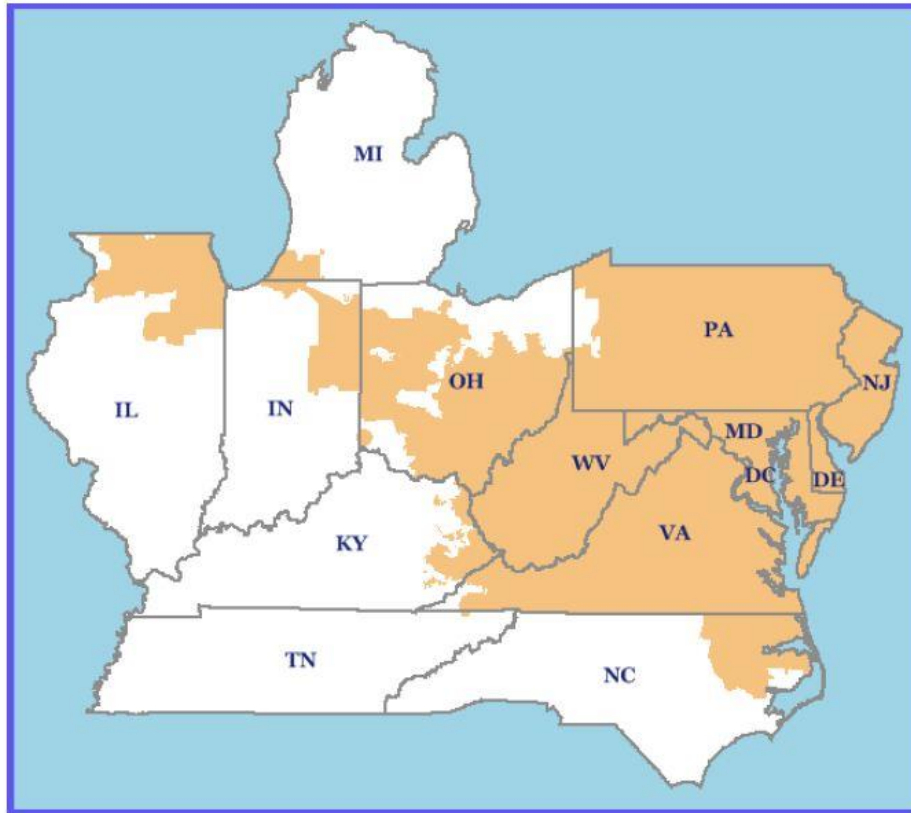
WECC, EPA Clean Power Plan: Phase I Preliminary Technical Report, Sept 2014.



PJM Study

PJM Interconnection Economic Analysis of the EPA Clean Power Plan Proposal March 2, 2015

PJM Electric Market



“State-by-state compliance options, compared to regional compliance options, likely would result in higher compliance costs for most PJM states.”

MISO Study

Analysis of EPA's Proposal to Reduce CO₂ Emissions from Existing Electric Generating Units
November 2014



“Regional compliance is approximately 40% less expensive.”

EPA Approval

- Each state's plan – no matter what the design – must demonstrate how the program will allow the state's existing sources to meet the CO₂ goal.
- Some of these details will be worked out in the approval process.
- Like the states, EPA has not done this before.

Questions

Better for States:

- Will a state plan that attempts to coordinate regionally be more likely to achieve grid reliability and lower compliance cost?
- Nevada's needs, opportunities in the region?
- Mass/Rate?

Better for EPA

- Will regional program(s) in your region be easier for EPA to review/approve?

Thank You for Your Time and Attention

About RAP

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

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

Learn more about RAP at www.raonline.org

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