



RAP

Energy solutions  
for a changing world

# Applying Clean Air Act §111(d) to GHG: Possible Compliance Options and Implications for the Western U.S. Power Sector

Presented by  
David Farnsworth and John Shenot

March 5, 2014

The Regulatory Assistance Project

50 State Street, Suite 3  
Montpelier, VT 05602

Phone: 802-223-8199  
[www.raponline.org](http://www.raponline.org)

# Outline

- The range of options States might have for compliance
- Possible implications for Western power sector interests, including cross-state effects

# Ways to Reduce Power Sector Emissions

1. Reduce emissions rates (lb/MWh) of existing power plants to individually meet EPA guidelines



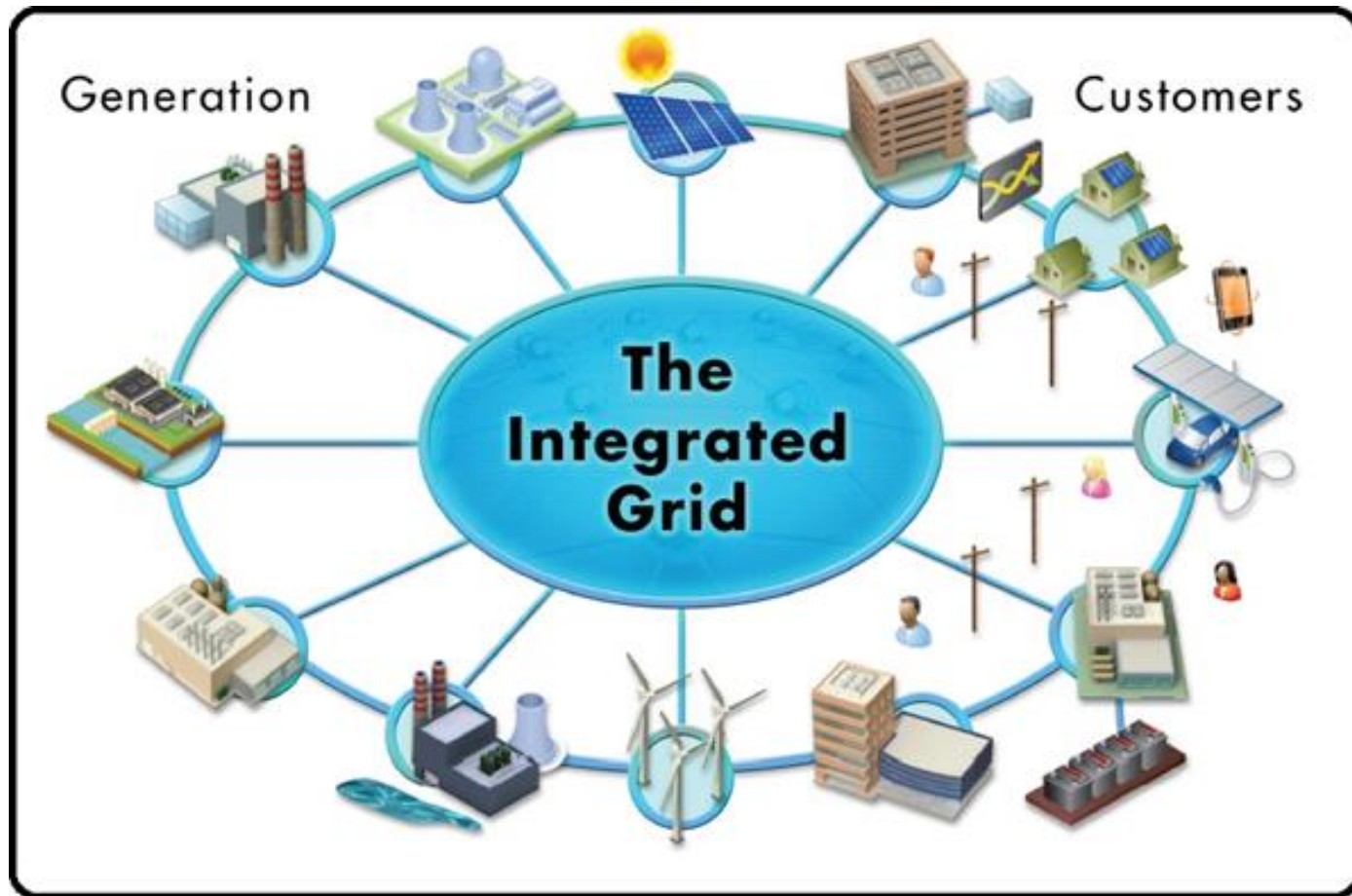
# Some Options for Reducing the Emissions Rate of an Individual Power Plant

- Fuel switching or co-firing with biomass
- Steam turbine efficiency improvements, combustion control optimization, etc.
- Cooling system/flue gas heat loss recovery
- Combined heat and power
- Carbon capture/utilization/storage
  - EPA will NOT require this

# Ways to Reduce Power Sector Emissions

2. Get equivalent results by reducing the average emissions rate (lb/MWh) or mass of emissions (e.g., lb/yr) from an aggregation of covered power plants

# Aggregations of Power Plants



Source: EPRI

# Some Options for Reducing Emissions from an Aggregation of Power Plants

- Dispatch lower emitting resources relatively more often and higher emitting resources relatively less often
  - Change dispatch order
  - Add lower emitting resources to the system
  - Retire higher emitting power plants
- Reduce aggregate generation through end-use efficiency or reduced line losses

# Policy Options with Examples from Western States

Type of Enabling Policy	Examples
Renewable Portfolio Standard (RPS)	AZ, CA, CO, MT, NM, NV, OR, WA
Integrated Resource Planning (IRP)	All states in Western Interconnection
Energy Efficiency Resource Standards, Building Codes, Appliance Standards, etc.	All or nearly all states in Western Interconnection



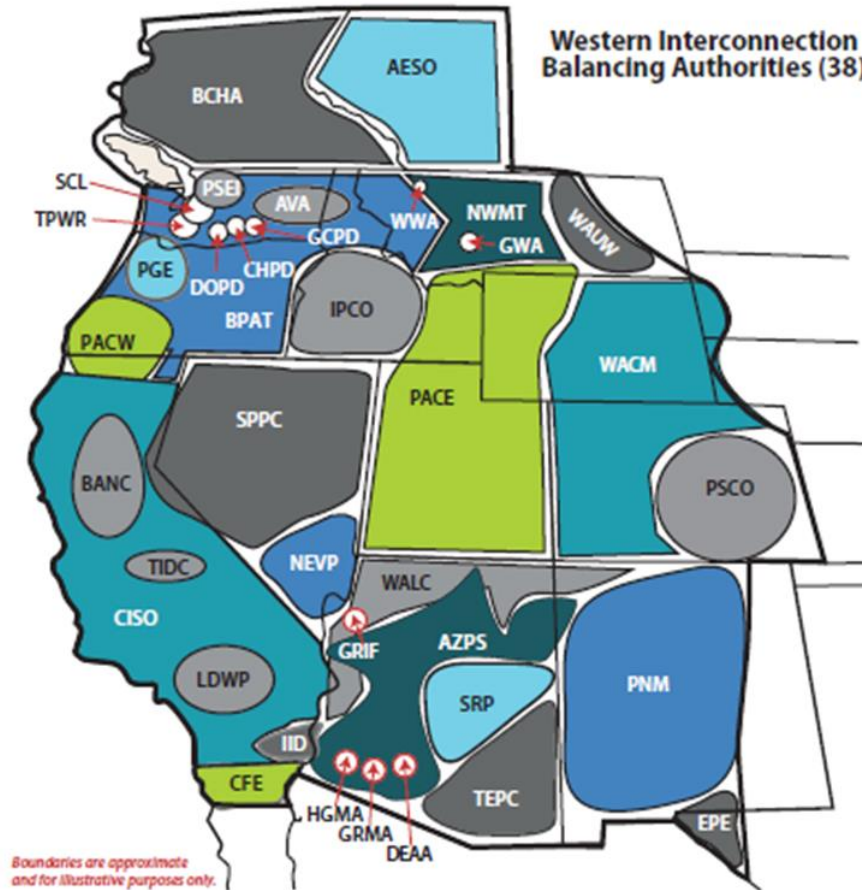
# More Policy Options

Type of Enabling Policy	Western Interconnection Examples
Allowance trading system	<a href="#"><u>Federal Acid Rain Program</u></a> <a href="#"><u>CA Cap-and-Trade Program</u></a>
State GHG Emissions Performance Std. (lb/MWh)	<a href="#"><u>CA, MT, OR, WA (for new/modified sources)</u></a>
Loading Order	<a href="#"><u>CA</u></a>
Bubble Permits/Averaging	<a href="#"><u>WA</u></a>
Voluntary/negotiated/tailor-made plan	<a href="#"><u>CO Clean Air Clean Jobs Act</u></a>
Carbon tax	<a href="#"><u>BC</u></a>

# Individual State Actions will Affect Neighbors

- Clean Air Act requires *state air pollution regulators* to develop compliance plans
- Their choices may affect:
  - Utilities and merchant generators
  - Balancing authorities and wholesale power markets
  - Retail electricity customers
  - PPA customers
  - Energy regulators
- **Impacts across state lines likely**

# Example: Multi-State Utilities or Balancing Authorities



# Example: Navajo Generating Station



- Located on Navajo Reservation in AZ
- Serving load in AZ, CA, NV
- Operated by Salt River Project (SRP)
- Owned by SRP, U.S. Bureau of Reclamation, L.A. Dept. of Water and Power, Arizona Public Service, NV Energy, and Tucson Electric Power
- Operation Permit overseen by EPA Region 9, not State of Arizona
- Could Navajo tribe seek Treatment as a State for 111d purposes?

# Example: Colstrip Power Plant

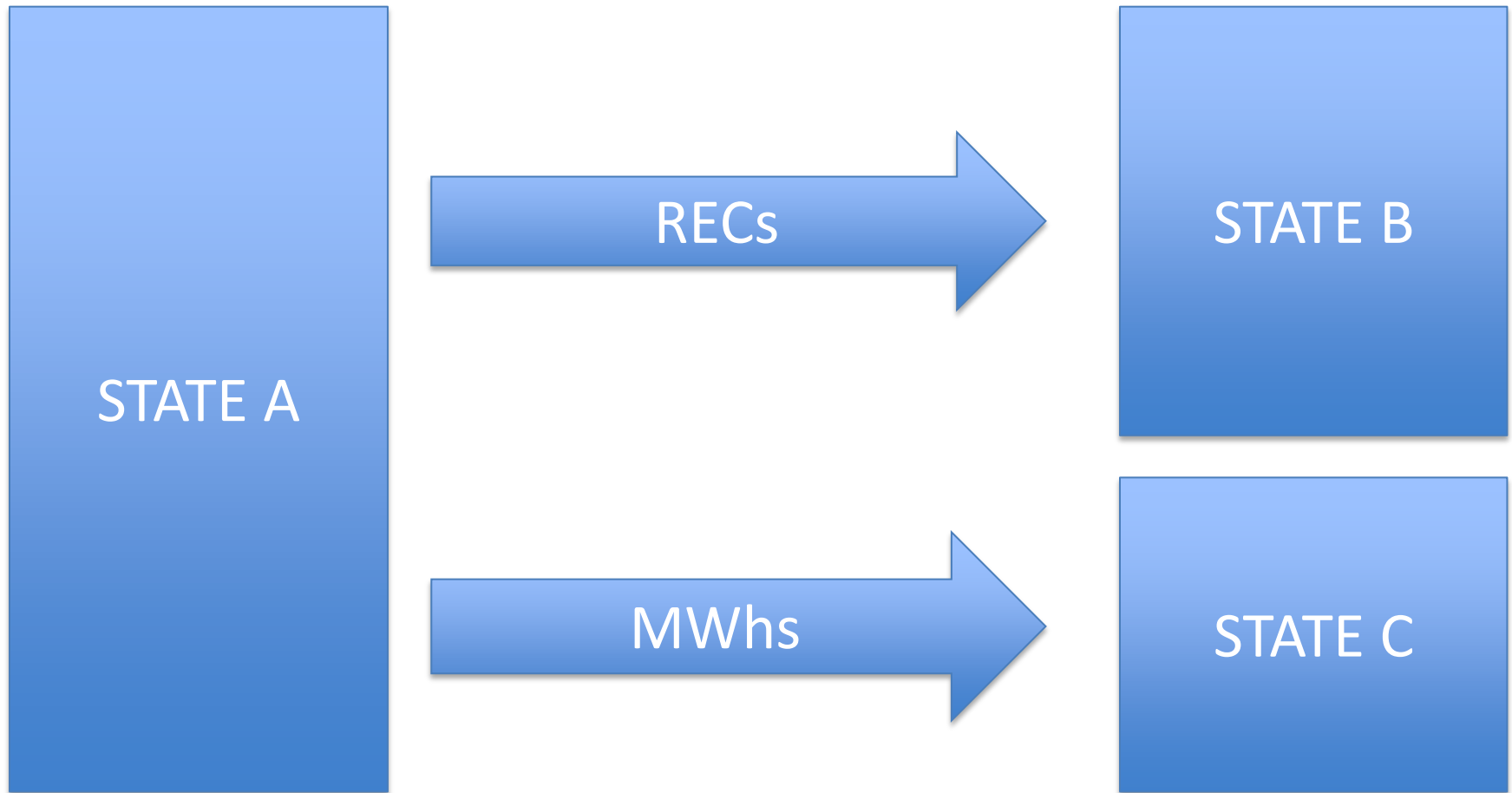


- Located in MT
- Serving load in MT, WA, OR
- Operated by PPL Montana
- Owned by PPL Montana, Puget Sound Energy, Portland General Electric, Avista, PacifiCorp, and NorthWestern Energy

# Example: Sale of Renewables



# Electricity and RECs



# Conclusions

- States will have flexibility in designing 111(d) compliance strategies
- States are likely to have options that focus on individual power plants and options for aggregations of power plants
- Communications are essential:
  - between air regulators and energy regulators
  - possibly even across state lines or regionally



## 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 and natural gas sectors. 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.raonline.org](http://www.raonline.org)

David Farnsworth: [dfarnsworth@raonline.org](mailto:dfarnsworth@raonline.org)

John Shenot: [jshenot@raonline.org](mailto:jshenot@raonline.org)



### **The Regulatory Assistance Project**

Beijing, China • Berlin, Germany • Brussels, Belgium • **Montpelier, Vermont USA** • New Delhi, India  
50 State Street, Suite 3 • Montpelier, VT 05602 • phone: +1 802-223-8199 • fax: +1 802-223-8172

[www.raonline.org](http://www.raonline.org)