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Capturing Energy and Water Efficiency Savings for EPA's Clean Power Plan

WaterSmart Innovations

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American Council for an Energy-Efficient Economy

American Council for an Energy-Efficient Economy (ACEEE)

- ACEEE is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors
- 50 staff; headquarters in Washington, D.C.
- Focus on energy efficiency in industry, buildings, & transportation sectors
- Research in economic analysis & financing, behavior, energy efficiency programs, national policy, utilities, state, & local policy, and some international work
- Diverse funding sources, including foundation grants, contracts and government grants, and conferences & publications



Agenda

- Connecting water, energy, and emissions
- EPA's Clean Power Plan
- Using energy and water efficiency for compliance
- Revenue stream for projects

Water-Energy Nexus

- Water and energy systems are interdependent on one another
- Electricity is needed to transport, treat, heat, cool, and recycle water and, conversely, water is needed in energy production
- This water-energy nexus means that saving water saves energy and vice versa

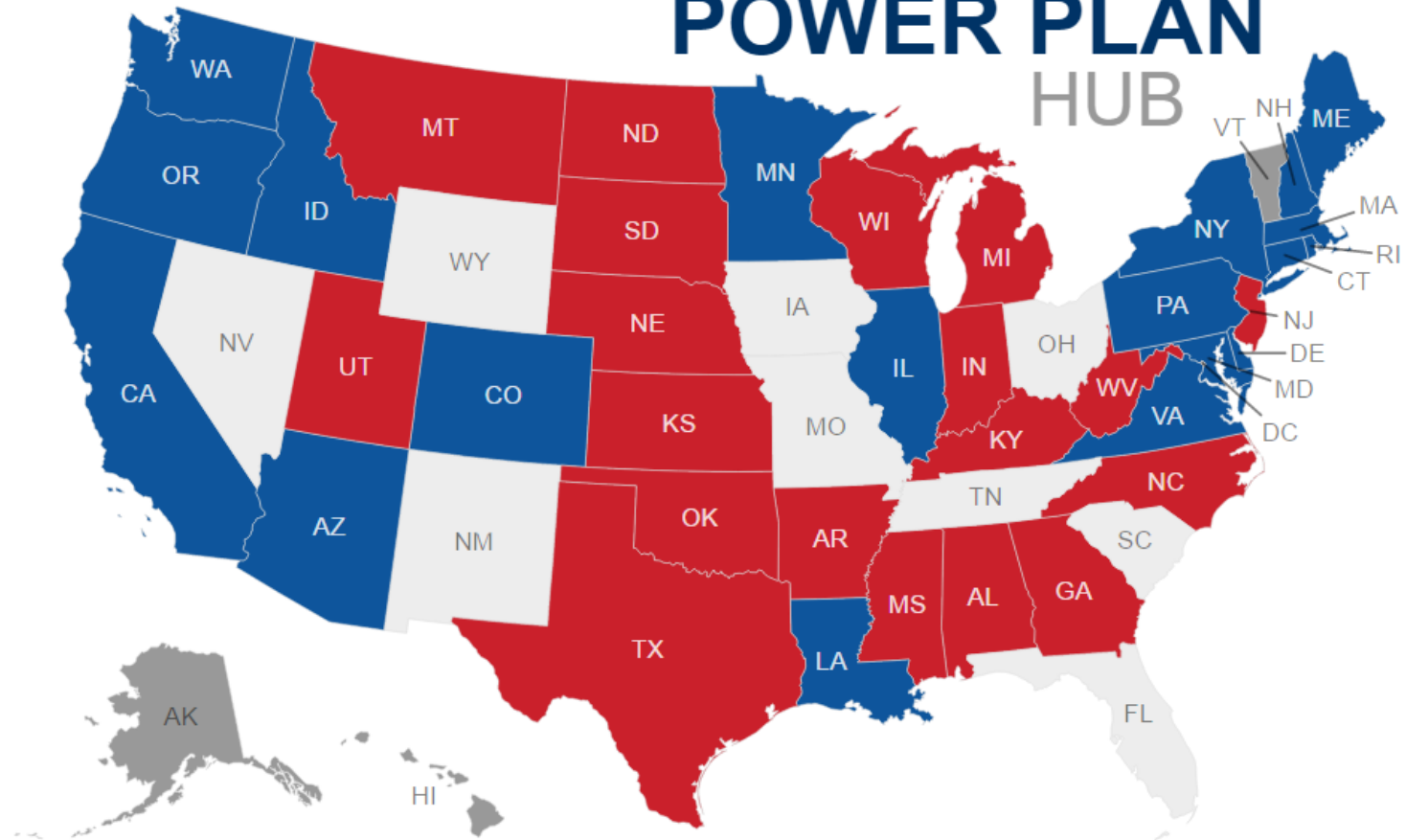
Saving Water Reduces Emissions

- Saving water reduces the amount of fossil fuels burned to meet energy needs, which reduces emissions of harmful air pollutants
- Water efficiency measures could reduce water consumption by 30% and save about:
 - 50 million MWh
 - 30 million tons of CO₂
 - 25,000 tons of NO_x
 - 50,000 tons of SO₂

EPA's Clean Power Plan (CPP)

- The Clean Power Plan will regulate CO₂ emissions from existing coal and natural gas power plants
- In 2030, CPP will reduce CO₂ emission by 32% (compared to 2005 levels)
- States have a wide variety of strategies for compliance, including energy efficiency
- Supreme Court issued 'stay' on CPP rule and DC Circuit Court of Appeals just heard oral arguments, however many states are continuing to plan for compliance

E&E's POWER PLAN HUB



Supreme Court Stay Response

Continuing Planning



19 states

Assessing Planning



9 states

Suspending Planning



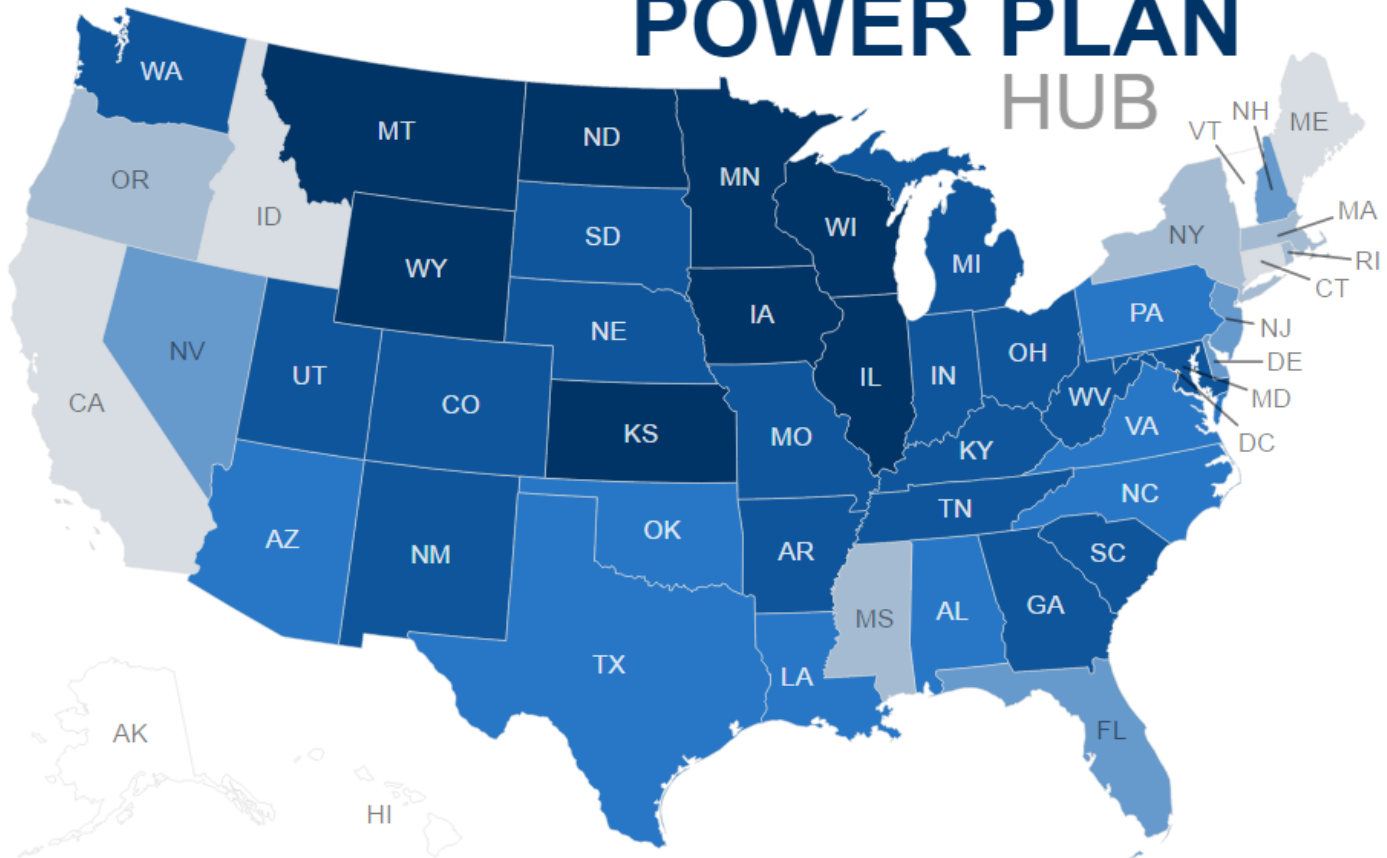
19 states

Exempt



4 states

E&E's POWER PLAN HUB



Final Rule Emissions Rate Reduction %

7 - 14%
4 states

14 - 21%
5 states

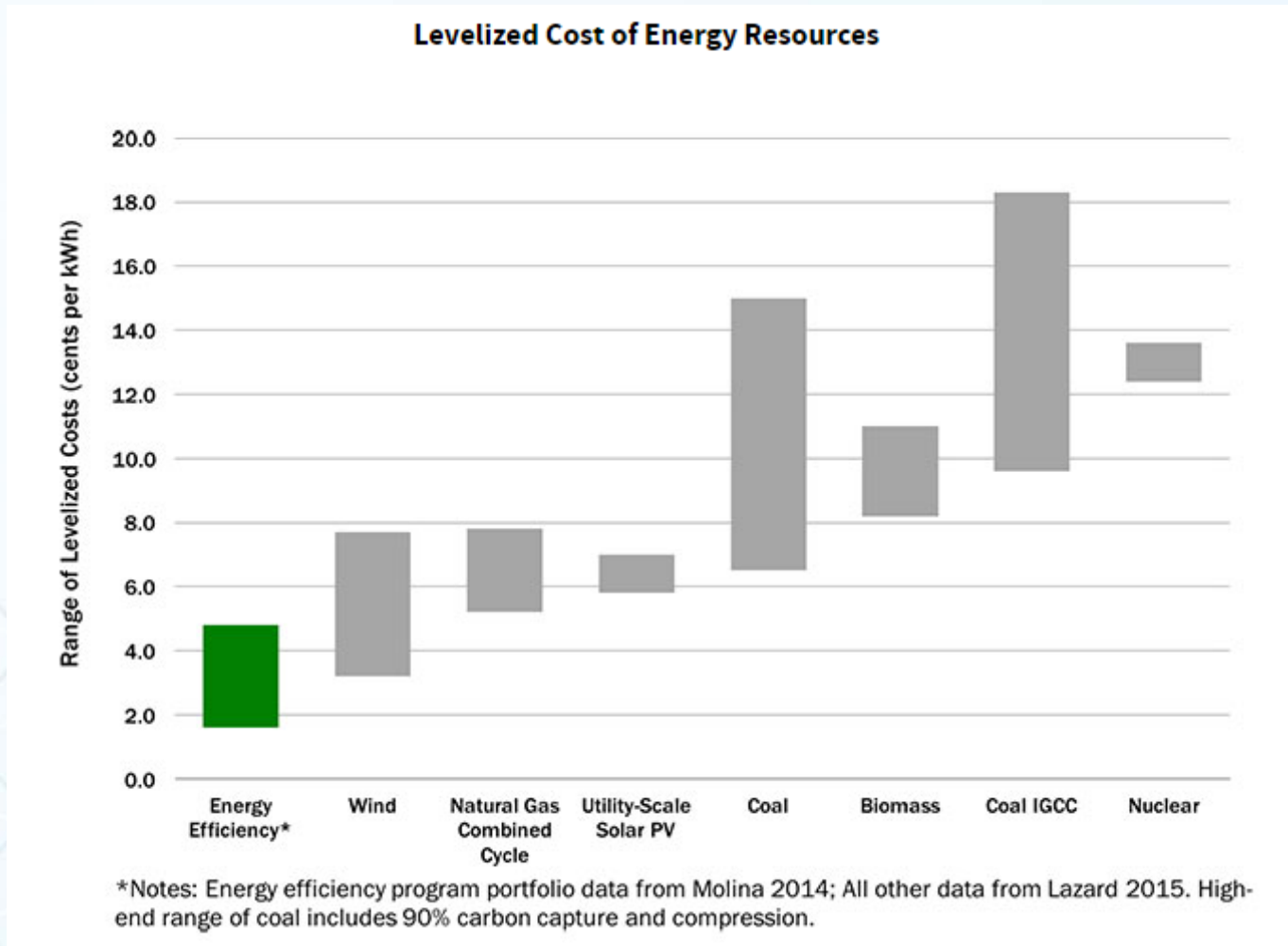
21 - 27%
5 states

27 - 34%
8 states

34 - 41%
17 states

41 - 47%
8 states

Energy Efficiency as Least-Cost Resource



Using Efficiency as a CPP Compliance Strategy

- Water and wastewater programs
- Utility and non-utility programs
- Residential, commercial and industrial measures
- Energy savings performance contracts (ESPC)
- Combined heat and power
- Building energy codes
- Appliance replacement and recycling programs
- Behavioral programs
- State appliance and equipment standards

Efficiency Strategies for CPP Compliance

- Reduced energy demand leads to emissions reductions at power plants covered by CPP
- Energy efficiency in water and wastewater facilities
 - Examples: install efficient equipment, operational improvements, upgrade facility buildings, install combined heat and power (CHP)
 - Reduced energy demand avoids emissions
- Water-use efficiency
 - Examples: install efficient appliances and fixtures, repair leaks throughout water system, water conservation incentives
 - Reduced embedded energy in water avoids emissions

Greater Lawrence Sanitary District

- Wastewater treatment facility serving population of over 200,000 in northern MA and southern NH
- Participated in state-run energy management pilot program
- Upgrades included:
 - Performed energy audit
 - Insulated digesters, and improved HVAC and heat recovery systems
 - Improvements to aeration, plant water pumping system, operations and lighting
 - Installed a 310-kW solar PV system
- Total costs approx. \$4.5 million; funded through grants, state funds, ARRA assistance, and utility incentives
- Projected annual savings: decrease energy costs by nearly \$1.5 million (49% of district's energy budget) and avoid about 5,000 metric tons of CO₂ emissions

Demonstrating Compliance with CPP

- When
 - Compliance begins in 2022, potential for early compliance
- What
 - Several compliance plan approaches to choose from, including:
 - Mass-based plan – cap on total CO₂ emitted from plant
 - Rate-based plan – emission rate for plant (lbs CO₂/MWh)
- Where
 - Emission reductions within state boundaries count for compliance
 - States can also trade emission reductions with one another (in the form of allowances or credits, depending on plan type)
- How
 - Emission reductions from energy and water efficiency efforts credited differently depending on plan type
- Who
 - State air offices in charge of submitting compliance plans to EPA
 - Power plant owners must demonstrate emission reductions

Revenue Stream for Projects

- CPP compliance can create a revenue stream for projects in addition to traditional funding sources
- Different mechanisms: allowances or emission rate credits (ERCs)
- Revenue from CPP compliance
 - Credit is generated for each year of savings from project
 - Power plant owners purchase credit to demonstrate compliance
 - States can engage in trading of credits
 - Credit value depends on the market

Key Takeaways

- Water sector can take advantage of the momentum of the CPP to increase water conservation efforts, improve energy efficiency, and reduce CO₂ emissions
- CPP creates opportunity for state and local governments to increase investments in energy and water efficiency
- CPP can create an additional revenue stream for projects
- Work with your state regulators to get involved with CPP compliance planning efforts

Additional Resources

- EPA Clean Power Plan – www.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants
- ACEEE Clean Power Plan Webpage - aceee.org/topics/clean-power-plan
- State and Utility Pollution Reduction Calculator Version 2 (SUPR 2) - aceee.org/research-report/e1601
- Answers to State Questions (ASQ) - cpp.naseo.org/asq
- The Energy-Water Nexus: Exploring the Stream of Opportunities - aceee.org/sites/default/files/pdf/energy-water-nexus.pdf
- Watts in a Drop of Water: Savings at the Water-Energy Nexus - aceee.org/white-paper/watts-in-drop-water
- Tackling the Nexus: Exemplary Programs that Save Both Energy and Water - aceee.org/research-report/e131
- Local Energy Efficiency Self-Scoring Tool Version 2.0 Beta - aceee.org/research-report/u1511
- The 2015 City Energy Efficiency Scorecard - aceee.org/research-report/u1502

Questions?

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