



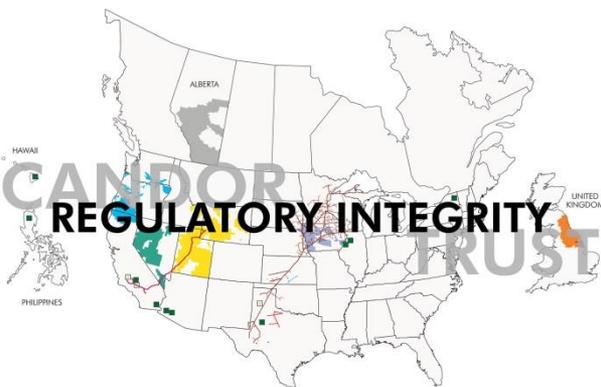
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EMPLOYEE COMMITMENT



ENVIRONMENTAL RESPECT



OPERATIONAL EXCELLENCE



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Initial Assessment of the Clean Power Plan

March 22, 2016

Purpose



- Describe modeling approach
- Compare rate method and mass method of compliance

Study Approach



- Limit study to Iowa load served by Iowa generators, plus imports of generation owned by Iowa load serving entities, plus joint-owned unit shares of fossil generation exported out of Iowa
 - The Iowa “island” is representative of the Iowa compliance obligation
 - MISO studies developed through the Planning Advisory Committee provide broader regional perspectives
- Hourly load developed from history and growth assumptions for MidAmerican Energy and non-MidAmerican load serving entities
- Generation included in the model
 - Remove Iowa wind generation where PPAs commit those resources to serve load outside Iowa
 - Include generation outside the state committed to serve Iowa load where known long-term commitments exist
 - Include MidAmerican wind resources through Wind X
 - Include new Alliant Marshalltown combined cycle plant
 - Include generation retirements known through public announcements

Study Approach



- Iowa zone production cost models
 - Least hourly production cost simulations that include fuel and variable operations and maintenance costs, or in cases where a CO₂ dispatch adder is modeled, least production plus emissions cost
 - Capital costs of new resources are not included
 - Statistical modeling, including consideration of generator forced outages and wind availability
- The Iowa-only modeling method limits interstate exports, which limits CO₂ emissions compliance requirements
- Subcategory rate method and mass method based upon the federal implementation plan
- Carbon price varied to determine its effect
- New wind additions studied benefit the Iowa zone's compliance under either the rate or mass method

Rate vs. Mass Compliance



- Mass compliance and rate compliance will look different as new resources are added; key drivers include:
 - The targets set by the EPA are not equal - the Eastern Interconnection was the most limiting of the three U.S. electric systems in EPA studies and was given an additional CO₂ allocation for the mass-based compliance target:^[1]
 - The addition of Emissions Rate Credits (ERCs) in the denominator of the rate calculation^[2]
- The rate and mass methods differ in their compliance targets, and with respect to the impact of new resource additions, resource fuel switching, and retirement assumptions
- Higher renewables penetration levels favor the rate-method of compliance
- Rate vs. mass benefits become more closely aligned as coal energy production decreases in the resource mix

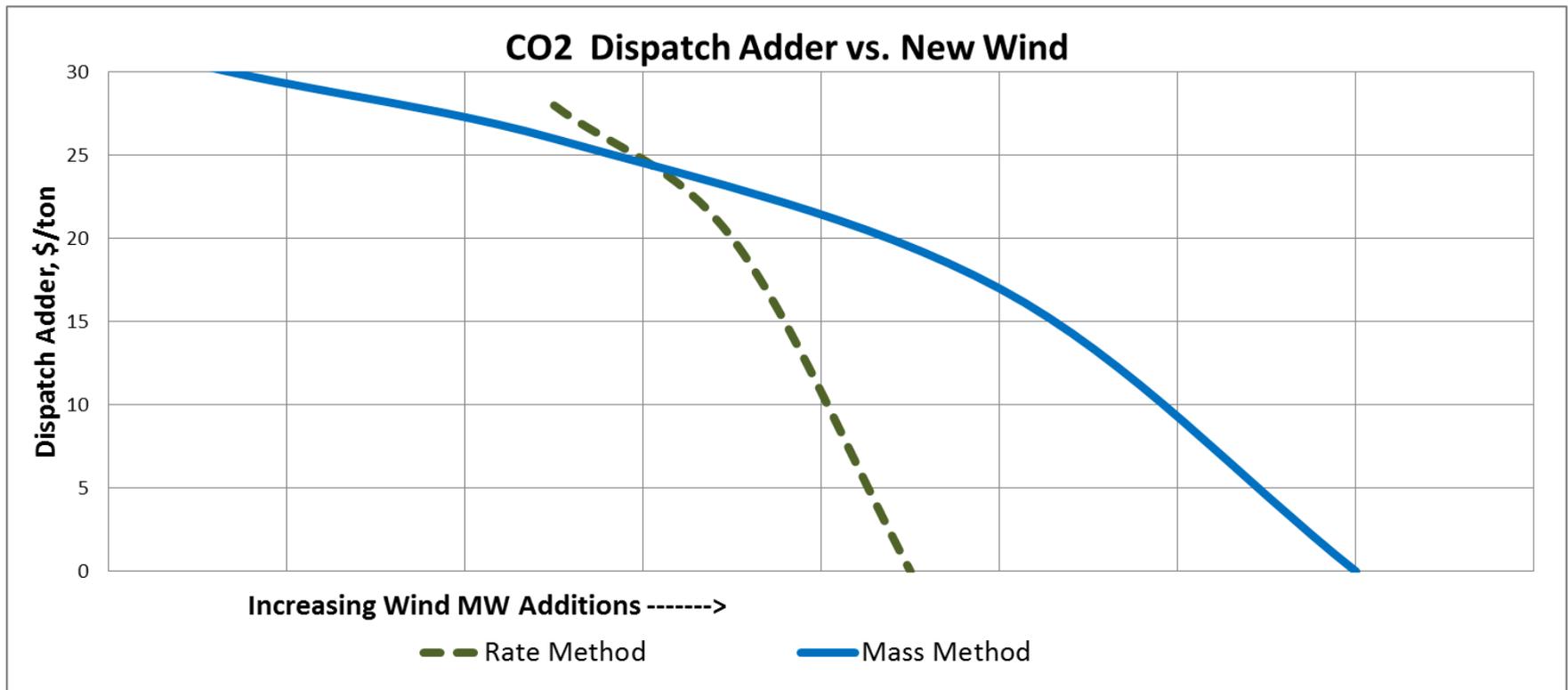
^[1] The Eastern Interconnection, Western Interconnection, and ERCOT are the three U.S. electric systems

^[2] ERCs are available by adding new renewables or energy efficiency

Model Results



- Impact of CO₂ dispatch adder and new wind additions – Year 2030
 - Rate method requires less wind than mass method to reduce the CO₂ dispatch adder, and the slope of the compliance line is steeper
 - Initial resource mix impacts the dispatch adder and wind quantity





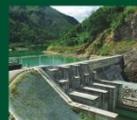
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