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Transmission/Distribution Impact on Renewables

Grid Access and Energy Operations Evolution

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Grid Provider Issues

- Constructing service where there is none today!
- Using traditional utility cost recovery mechanisms to finance these transmission projects may not be feasible
  - This becomes an increasing concern when renewable development goes towards meeting needs outside of the traditional utility “service territory”
  - Changes in transmission cost allocation methods are the policy fulcrum to use
    - This is an issue for state, “multistate regional” and federal level regulators and their many constituents
    - No shortage of industry meetings on these topics

Multiple Policy Originators

- State and federal level legal and regulatory inputs steer policy in the energy business
  - Not a standard set of rules today but some trends are evident
    - Utilities are tending to “Regionalize” their transmission access and planning
    - Wholesale energy markets are showing much greater promise for renewable energy integration than old utility methods
- Electric grid reliability standards have become mandatory with federal civil penalty enforcement authority vested at FERC

Generator Access Policy

- New energy resource providers may be interested to understand the state and federal policy boundaries related to generator access
- Primarily this boundary occurs at the retail energy customer meter point.
  - “Behind the Meter” generation, to the extent it is used only to reduce customer consumption from the grid and not deliver onto the grid, is typically a matter of state level energy policy
  - In recent months, the Federal Energy Regulatory Commission (FERC) has begun expanding its influence in this area under their policy proposals for “Demand Response Resources” in wholesale energy markets

Generator Access Policy

- If energy is transferred out from the retail customer's side of the meter or if energy resources are interconnected for wholesale access then federal regulations often come into the equation
  - Examples of grid-side energy access may include:
    - Retail-side generation that produces more energy than the retail customer consumes (but not in all cases)
    - Qualifying Facility (QF) selling to host utility under federal and state law
    - Wholesale generation that takes "Open Access Transmission Service"

From Access to Operations

- After grid access, what comes next?
- The grid operator must incorporate all energy resources in a reliable manner
- There are new industry methods for integrating renewable energy resources that show economy of scale, particularly for cases where the “host” utility of the renewable resource is relatively small

Increasing Renewable Impacts

- Increased balancing generation needed
- Increased use of quick start gas turbines to respond to footprint wind penetration
- Increased quick start gas turbine maintenance
- Congestion pattern changes (others adding wind in the footprint) and new planning challenges due to non-coincidence of resource and demand
- Increased cycling of base-load during minimum load conditions
- Regional transmission expansion costs

Summary

- Xcel Energy operating companies presently incorporate approximately 2700 MW of wind resources, one of the leading wind energy utilities in the country
- As other regions in the country develop their renewable resource potential, we will see increased levels of regional collaboration to resolve complex grid access and energy dispatch issues.


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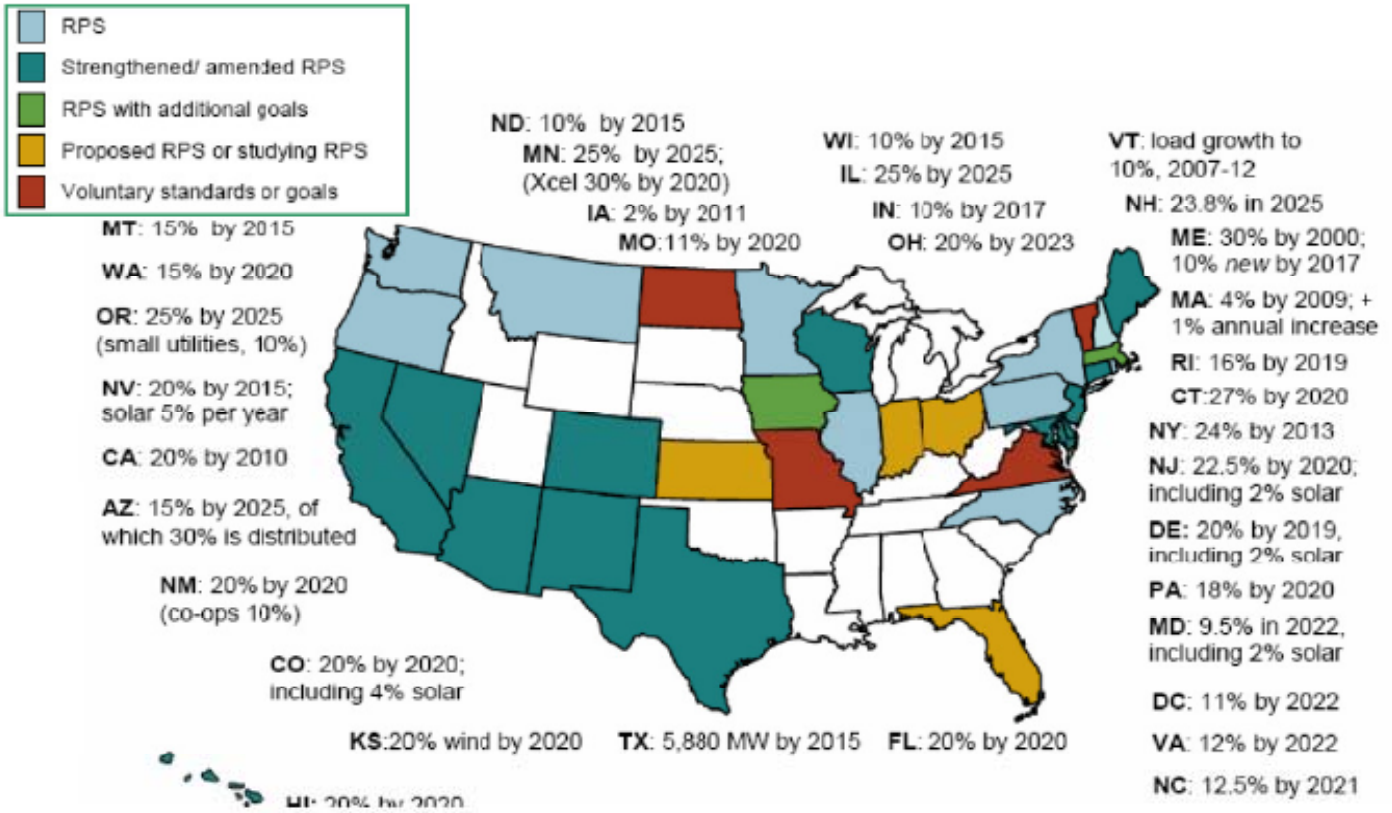
From Midwest Independent System Operator (MISO)
Planning Advisory Committee meeting materials, 4/2/2008:

Renewable Energy Portfolio Standards (RPS)



Source: http://www.ferc.gov/market-oversight/mkt-electric/overview/2007/elec-ovr-rps.pdf

MidwestISO
Energizing the Heartland