RTOs and ISOs: Uniformity, Regionalization, and Future Challenges

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<table>
<thead>
<tr>
<th>Regional Transmission Organization</th>
<th>Jurisdiction</th>
<th>Customers</th>
<th>Generation capacity</th>
<th>Miles of Transmission Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>PJM</td>
<td>Multi-state</td>
<td>61 million</td>
<td>183,000 MW</td>
<td>63,000</td>
</tr>
<tr>
<td>ISO-NE</td>
<td>Multi-state</td>
<td>14 million</td>
<td>32,000 MW</td>
<td>8,000</td>
</tr>
<tr>
<td>MISO</td>
<td>Multi-state</td>
<td>48 million</td>
<td>205,759 MW</td>
<td>65,000</td>
</tr>
<tr>
<td>SPP</td>
<td>Multi-state</td>
<td>15 million</td>
<td>77,366 MW</td>
<td>48,000</td>
</tr>
<tr>
<td>ERCOT</td>
<td>Single state</td>
<td>23 million</td>
<td>84,000 MW</td>
<td>40,530</td>
</tr>
<tr>
<td>CA-ISO</td>
<td>Single state</td>
<td>30 million</td>
<td>59,000 MW</td>
<td>25,865</td>
</tr>
<tr>
<td>NYISO</td>
<td>Single state</td>
<td>19.5 million</td>
<td>37,925 MW</td>
<td>11,005</td>
</tr>
</tbody>
</table>
Key Actors in RTO Decision Making

Electric System

Stakeholders

Generation Utilities

Transmission

Distribution

Industrial

Service

Residential

RTO/ISO

State- PUC, Energy Office (Policies & Planning), Environmental Office (Siting)

Industrial, Commercial & Residential Consumers

FERC

Federal and State Courts

Civil Society Stakeholders
Stakeholder Classes

**PJM (5)**
- Transmission Owners
- Generation Owners
- Electricity Distributors
- End Use Sectors
- Others

**CAISO (6)**
- Transmission Owners
- Generation Owners
- Transmission Dependent Utilities
- End Users & Retail Energy Providers
- Alternative Energy Providers
- Public Interest Groups
- Marketers

**MISO (10)**
- Transmission Owners
- Generation Owners/Independent Power Producers
- Power Marketers
- Transmission Dependent Utilities (munis/co-ops)
- Eligible End Use Customers
- Coordinating Members
- Transmission Developers
- State Regulators (OMS)*
- Consumer Advocates*
- Environmental/Other*

* Non Paying
Critical dimensions of RTO/ISO differences

• Single or multi-state
• Member state politics/interests
• Traditionally structured or restructured markets
• RTO member, voting and advisory structure
• RTO stakeholder interests, power and opportunities
• Role of FERC (and shifting politics of FERC)
• Dominant fuel source with state/RTO/ISO
The remaining states use data from the 1987 "Wind Energy Atlas of the United States".

Wind Power Classification

<table>
<thead>
<tr>
<th>Wind Power Class</th>
<th>Resource Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marginal</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>Excellent</td>
</tr>
<tr>
<td>6</td>
<td>Outstanding</td>
</tr>
<tr>
<td>7</td>
<td>Superb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wind Power Density at 50 m W/m²</th>
<th>Wind Speed at 50 m m/s</th>
<th>Wind Speed at 50 m mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 - 300</td>
<td>5.6 - 6.4</td>
<td>12.5 - 14.3</td>
</tr>
<tr>
<td>300 - 400</td>
<td>6.4 - 7.0</td>
<td>14.3 - 15.7</td>
</tr>
<tr>
<td>400 - 500</td>
<td>7.0 - 7.5</td>
<td>15.7 - 16.8</td>
</tr>
<tr>
<td>500 - 600</td>
<td>7.5 - 8.0</td>
<td>16.3 - 17.9</td>
</tr>
<tr>
<td>600 - 800</td>
<td>8.0 - 8.8</td>
<td>17.9 - 19.7</td>
</tr>
<tr>
<td>800 - 1600</td>
<td>8.8 - 11.1</td>
<td>19.7 - 24.8</td>
</tr>
</tbody>
</table>

*Wind speeds are based on a Weibull k value of 2.0.

United States transmission grid
Source: FEMA

United States - Land-Based and Offshore Annual Average Wind Speed at 80 m

Conceptualizing RTOs/ISOs

- Agents of FERC: Entity delegated regulatory power from FERC
- Monopolists: Entities with monopoly power over transmission operations/markets that must be regulated by FERC
- Hybrids: Created by FERC regulation and market participants in region
- Agents of transmission owners in a region
- Regional planning entity for transmission

(Dworkin & Goldwasser, 2007)
Future Challenges for RTOs/ISOs

• Regional approaches to EPA’s Clean Power Plan
• Enhanced Transmission Planning Role
• New Regional Transmission Permitting/Siting Role???

• Queries:
  – What is the impact of existing RTO/ISO governance structures on addressing these challenges?
  – Do benefits of uniformity override regional needs?
States GRANTING Right of Eminent Domain to Merchant Transmission Lines

By STATUTE
- Florida, Kentucky, Michigan, Montana, New Mexico, Oregon, Rhode Island, Vermont, & Wisconsin

By PUC Order
- Kansas & Oklahoma
Examples:

- **MICHIGAN** (MICH. COMP. LAWS ANN § 486.255) - “... an independent transmission company or an affiliated transmission company shall have the power to condemn property that is necessary to transmit electric energy for public use...”

- **NEW MEXICO** (N.M. STAT. ANN. § 62-16A-4 (B)(8)) - The New Mexico Renewable Energy Transmission Authority may, “pursuant to the provisions of the Eminent Domain Code, exercise the power of eminent domain for acquiring property or rights of way for public use if needed for projects if such action does not involve taking utility property or does not materially diminish electric service reliability of the transmission system in New Mexico, as determined by the public regulation commission.”

- **RHODE ISLAND** (R.I. GEN. LAWS ANN. § 39-1-2(13)) – “‘Electric transmission company’ means a company engaging in the transmission of electricity or owning, operating, or controlling transmission facilities. An electric transmission company shall not be subject to regulation as a public utility except as specifically provided in the general laws, but shall be regulated by the federal energy regulatory commission and shall provide transmission service to all nonregulated power producers and customers, whether affiliated or not, on comparable, nondiscriminatory prices and terms. Electric transmission companies shall have the power of eminent domain exercisable following a petition to the commission pursuant to § 39-1-31.”
States DENYING Right of Eminent Domain to Merchant Transmission Lines

By STATUTE
- Illinois
- Maryland
- New Hampshire
- Nebraska

By PUC Order
- Arkansas
- Connecticut

Bans INTRASTATE merchant eminent domain ONLY
- New York

Limited eminent domain for ANY transmission lines
- Delaware
Examples:

- **ILLINOIS** (220 ILL. COMP. STAT. § 5/8-509, § 5/8-406.1(a), § 5/3-105(b)(7)): A “qualifying facility” (as defined by PURPA) is not a public utility and thus lacks eminent domain authority. (PURPA, 18 C.F.R. § 292.101(b)(i)) – A “qualifying facility” includes transmission lines that “directly and indirectly interconnect [with] electric utilities.”

- **NEBRASKA** (NEB. REV. STAT. § 70-1014.02(6), § 70-1014.02(1)(a)): “[O]nly an electric supplier may exercise its eminent domain authority to acquire the land rights necessary for the construction of transmission lines and related facilities to provide transmission services for a certified renewable export facility. The exercise of eminent domain to provide needed transmission lines and related facilities for a certified renewable export facility is a public use. Nothing in this section shall be construed to grant the power of eminent domain to a private entity.” “Electric supplier means a public power district, a public power and irrigation district, an individual municipality, a registered group of municipalities, an electric membership association, or a cooperative.”

- **NEW HAMPSHIRE** (N.H. REV. STAT. ANN. § 371:1) – “No public utility may petition for permission to take private land or property rights for the construction or operation of an electric generating plant or an electric transmission project not eligible for regional cost allocation, for either local or regional transmission tariffs, by ISO-New England or its successor regional system operator.”

- **CONNECTICUT** (Transenergie U.S. Ltd. 2000 WL 33121599 (Conn. D.P.U.C.) (2000)) – State P.U.C. held that merchant line Transenergie was not an “electric distribution company,” and as such, lacked the right of eminent domain.
States MIGHT Grant Right of Eminent Domain to Merchant Transmission Lines

STRONGER likelihood of eminent domain authority: Arizona, Colorado, Idaho, Indiana, Iowa, Massachusetts, South Dakota, Tennessee, Texas, West Virginia, & Wyoming

WEAKER likelihood of eminent domain authority: California, Hawaii, Minnesota, Nevada, & Pennsylvania

Examples:

• COLORADO (COLO. REV. STAT. ANN. § 38-2-101) – “If any corporation formed for the purpose of constructing a road, ditch, reservoir, pipeline, bridge, ferry, tunnel, telegraph line, railroad line, electric line, electric plant, telephone line, or telephone plant is unable to agree with the owner for the purchase of any real estate or right-of-way or easement or other right necessary or required for the purpose of any such corporation for transacting its business or for any lawful purpose connected with the operations of the company, the corporation may acquire title to such real estate or right-of-way or easement or other right in the manner provided by law for the condemnation of real estate or right-of-way.”

• MINNESOTA (In re Prairie Rose Transmission, LLC, 2012 WL 258025 (Minn. P.U.C., Jan. 13, 2012)) – The Minn. PUC granted a certificate of need for a private transmission project that would connect Prairie Rose Wind Farm to the grid, but noted that the company would not have eminent domain authority. The PUC did not explain why not, or whether the company had sought eminent domain authority for the line.

• WYOMING (Bridle Bit Ranch Co. v. Basin Elec. Power Co-op., 118 P.3d 996, 998, 1003 (Wyo. 2005)) – The WY supreme court held that a wholesale electric generation and transmission cooperative was not a public utility, and therefore did not need a certificate of public necessity and convenience, but that it could exercise eminent domain regardless.
Eminent Domain For Merchant Transmission
Providers

Allowed by Statute

Allowed by PUC Order

Merchant Eminent Domain LIKELY

Unclear

Intrastate Merchant Lines ONLY Banned

Merchant Eminent Domain UNLIKELY

Banned by PUC Order

Banned by Statute

Limited Eminent Domain for Any Transmission