Energy Technologies Area Lawrence Berkeley National Laboratory

Planning Electric Transmission Lines:
A Review of Recent Regional Transmission Plans

Fall 2016 Joint WIRAB-CREPC Meeting

San Diego, CA

October 31, 2016

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Outline of this Presentation

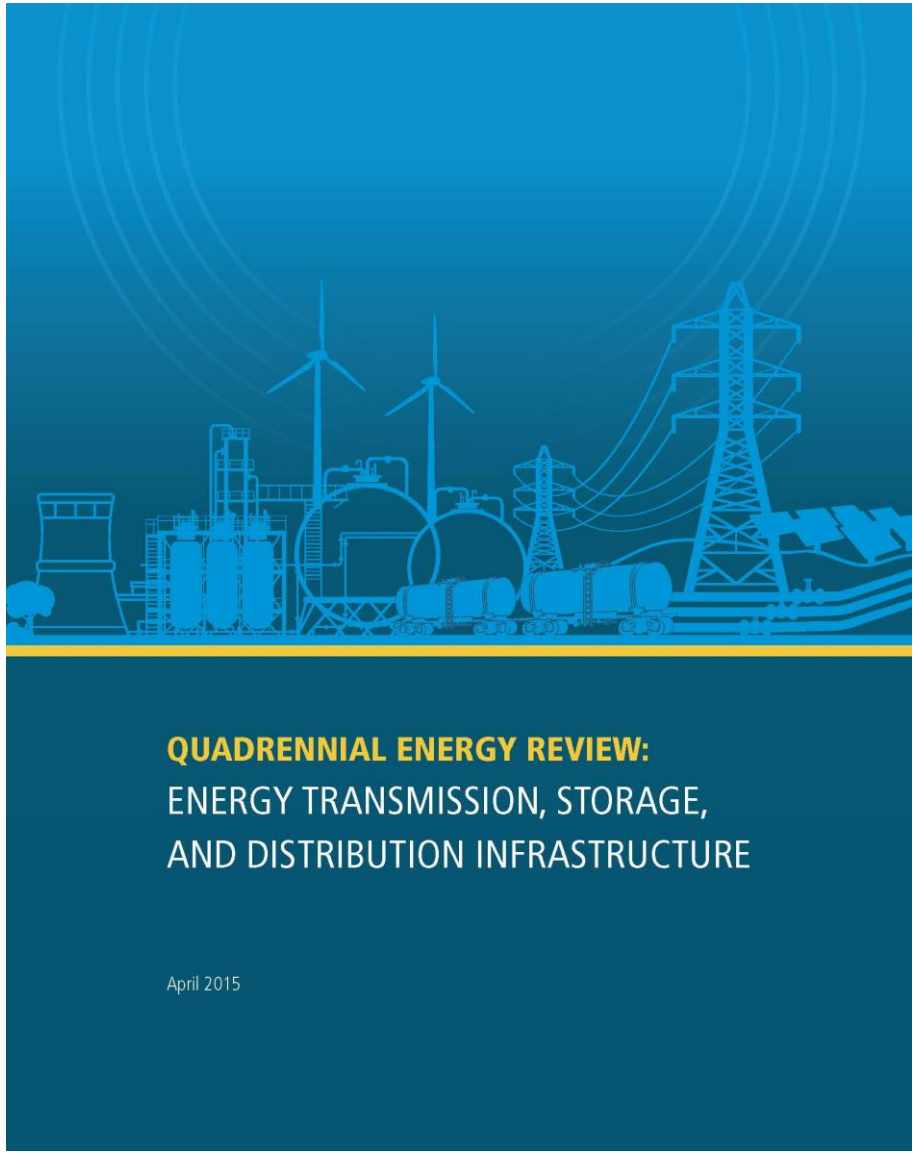
- Quadrennial Energy Review
- Key Themes
- FERC Order Nos. 890 and 1000
- Regional Planning Processes and Plans
  - Origin and Project Selection
  - Governance and Decision Making
  - Economic Evaluation Methods
- Findings and Recommendations

Caveat: *The information in LBNL's report and summarized in this presentation was developed based on publicly available reports up to about mid-2016*

Quadrennial Energy Review

Conduct a national review of transmission plans and assess barriers to their implementation

DOE should carry out a detailed and comprehensive national review of transmission plans, including assessments on the types of transmission projects proposed and implemented, current and future costs, consideration of interregional coordination, and other factors. A critical part of this review should be to assess incentives and impediments to the development of new transmission.



Key Themes

- FERC Order Nos. 890 and 1000 establish a consistent nation-wide set of principles to guide regional transmission planning and the selection of projects for regional cost allocation
- The resulting processes are new—it will take time to assess their functioning and efficacy
- It is important to start now to create the record upon which these assessments will be based
- The range and assessment of benefits considered will be a critical area for focus

FERC Order No. 1000

Planning:

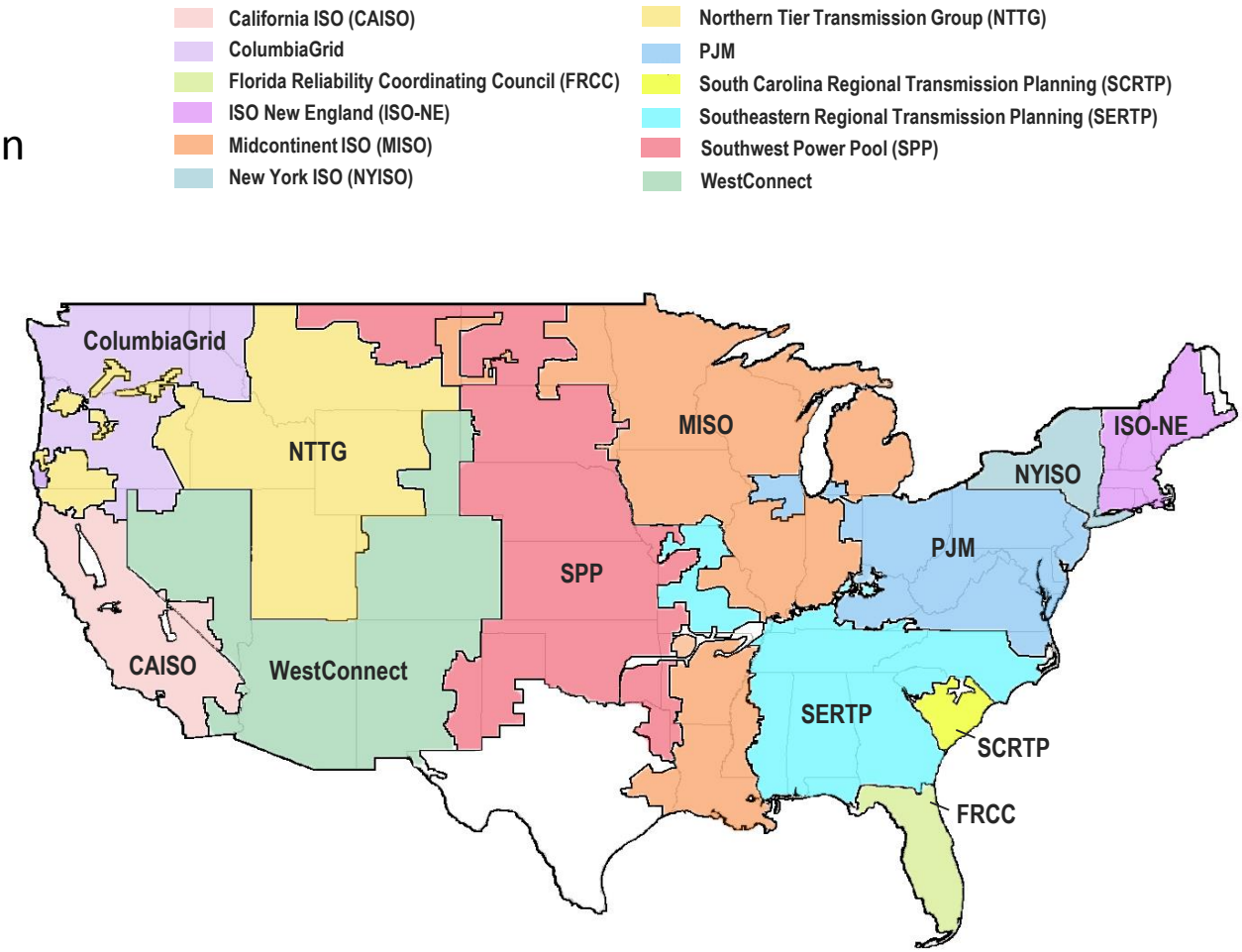
- Satisfy Order No. 890 principles
- Transmission needs driven by public policy
- Neighboring pairs of regions must coordinate

Cost Allocation:

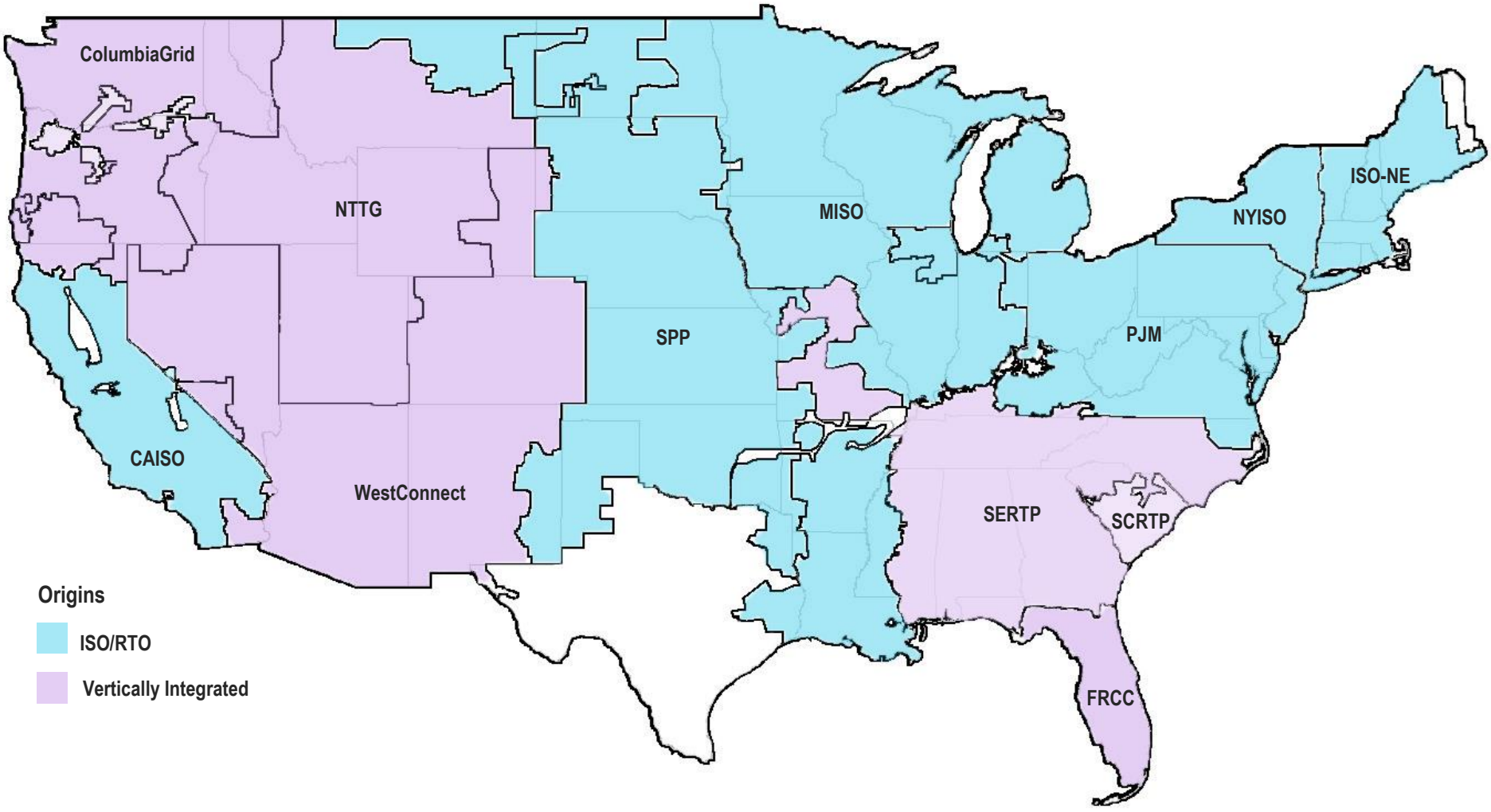
- Costs allocated "roughly commensurate" with estimated benefits

Non-Incumbent Developer:

- No federal right of first refusal



FERC Planning Regions and Project Selection



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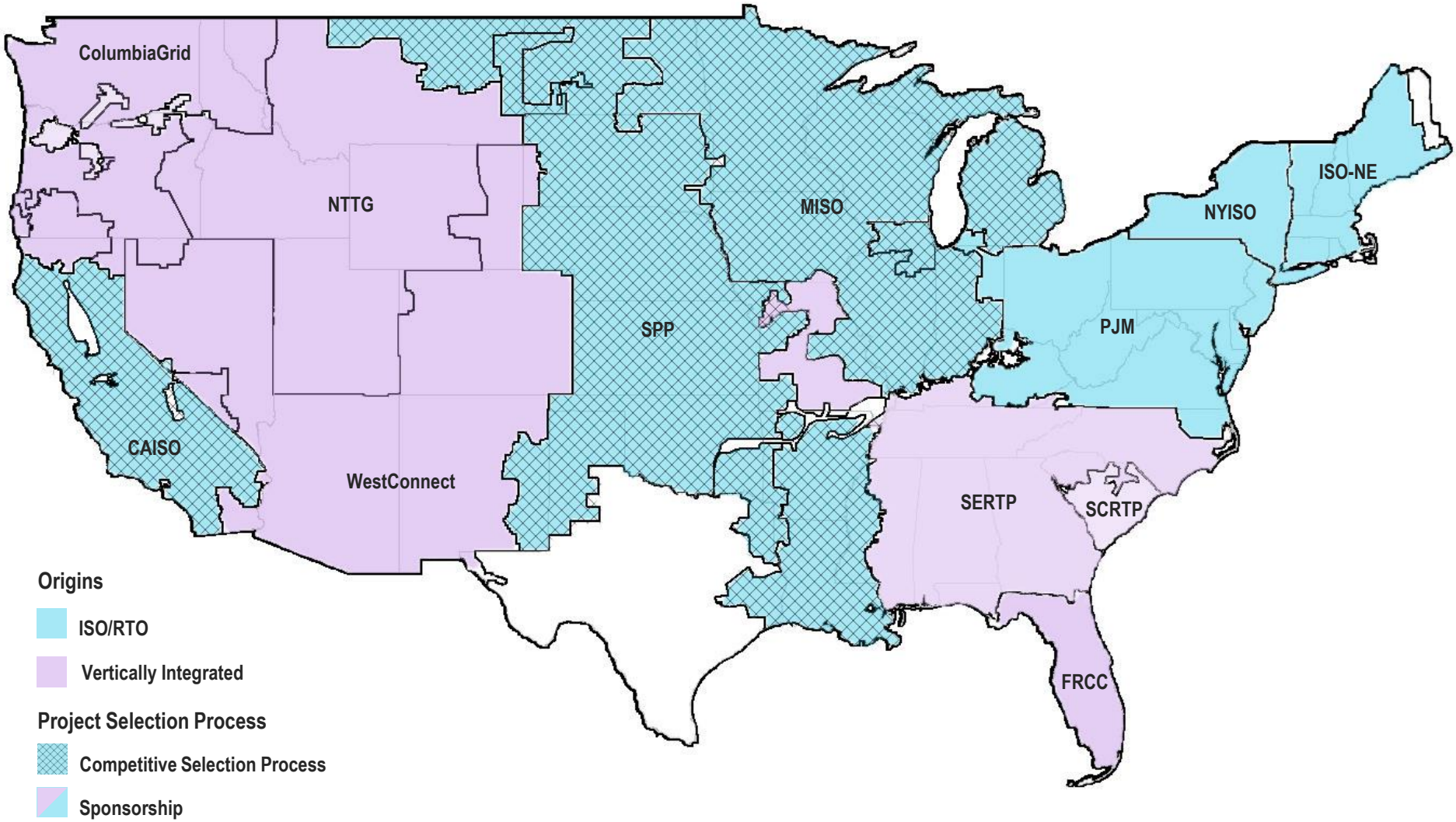
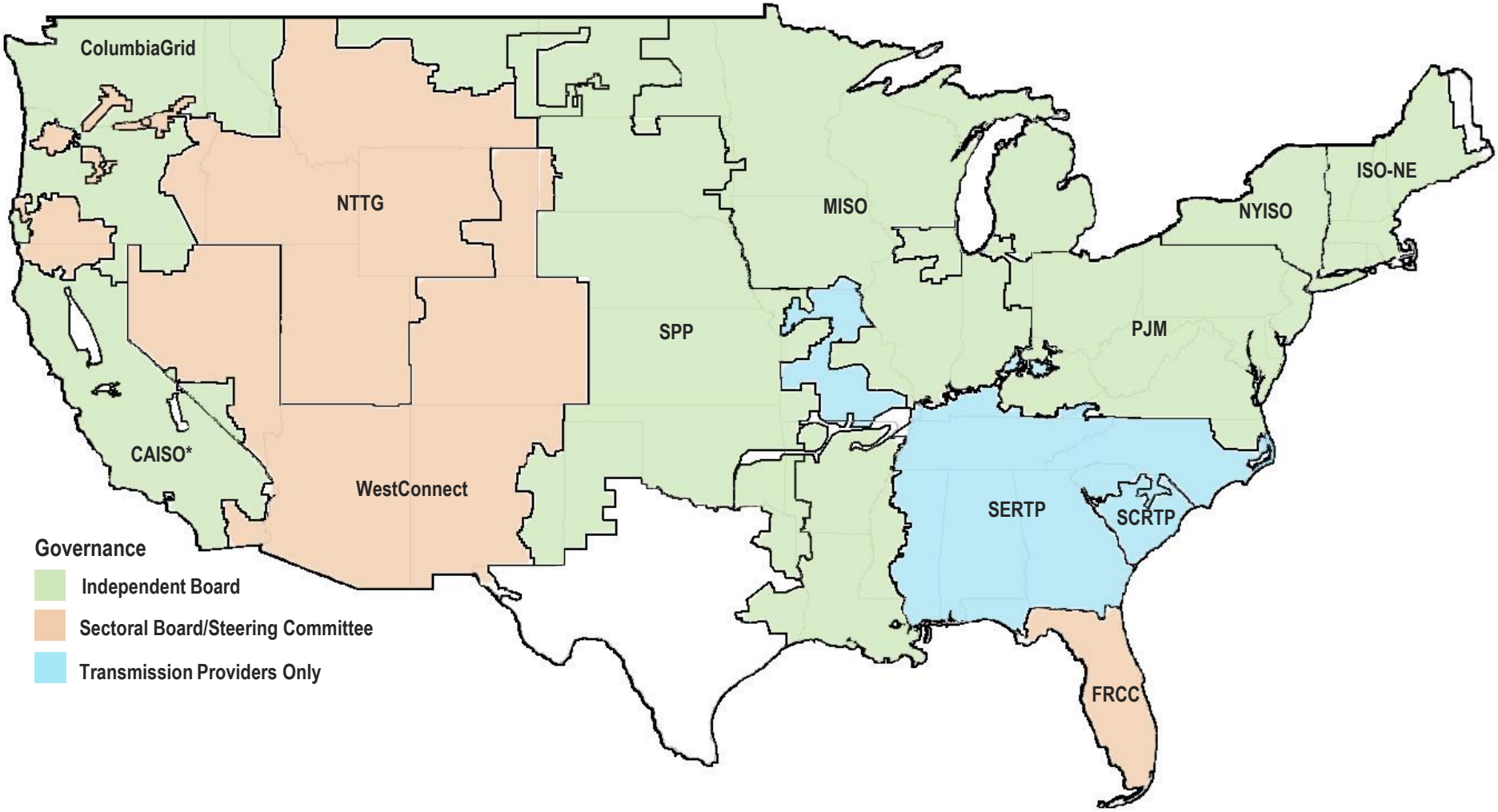


Governance and Decision Making



** Confirmed by Governor*

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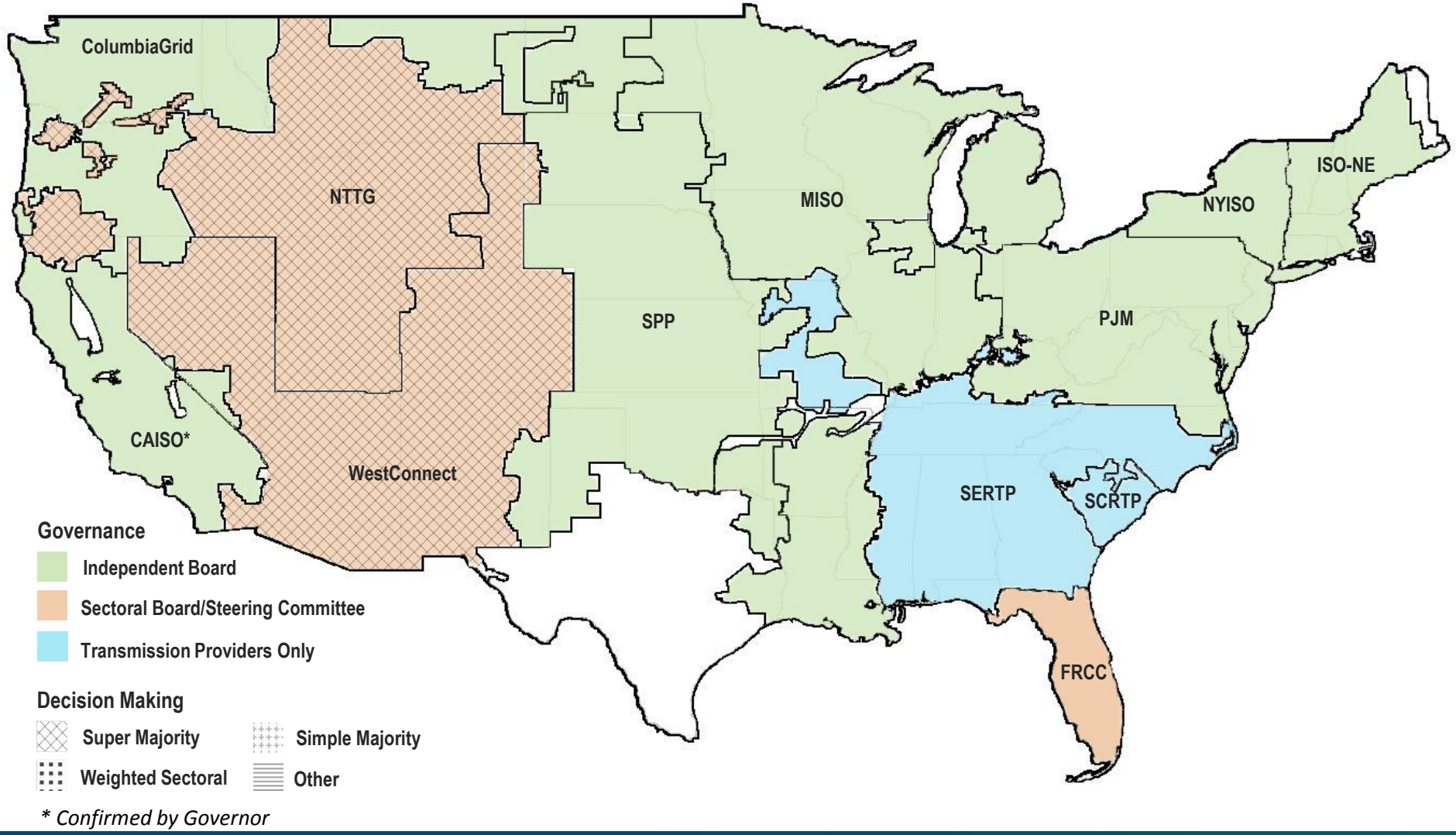

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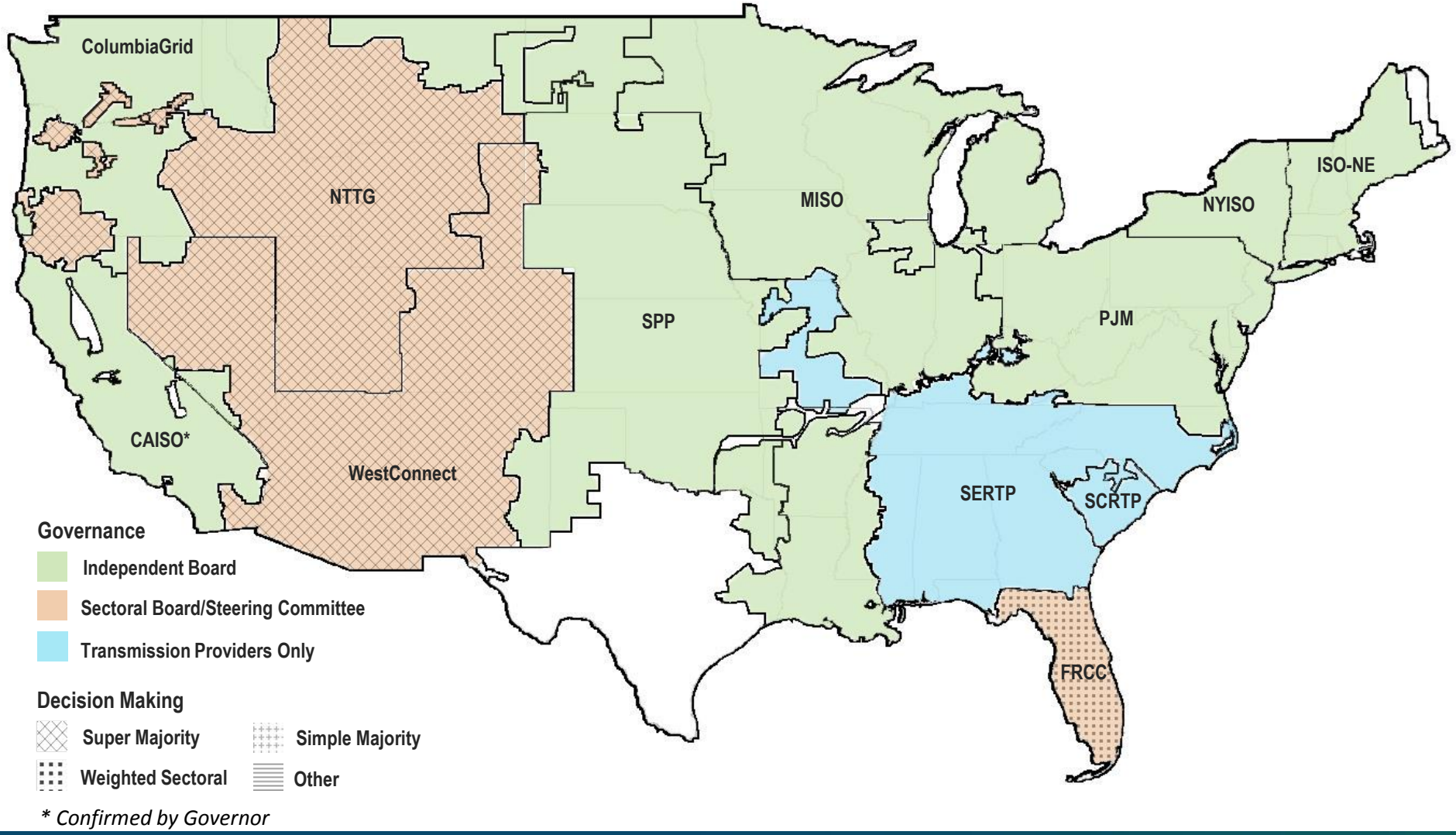

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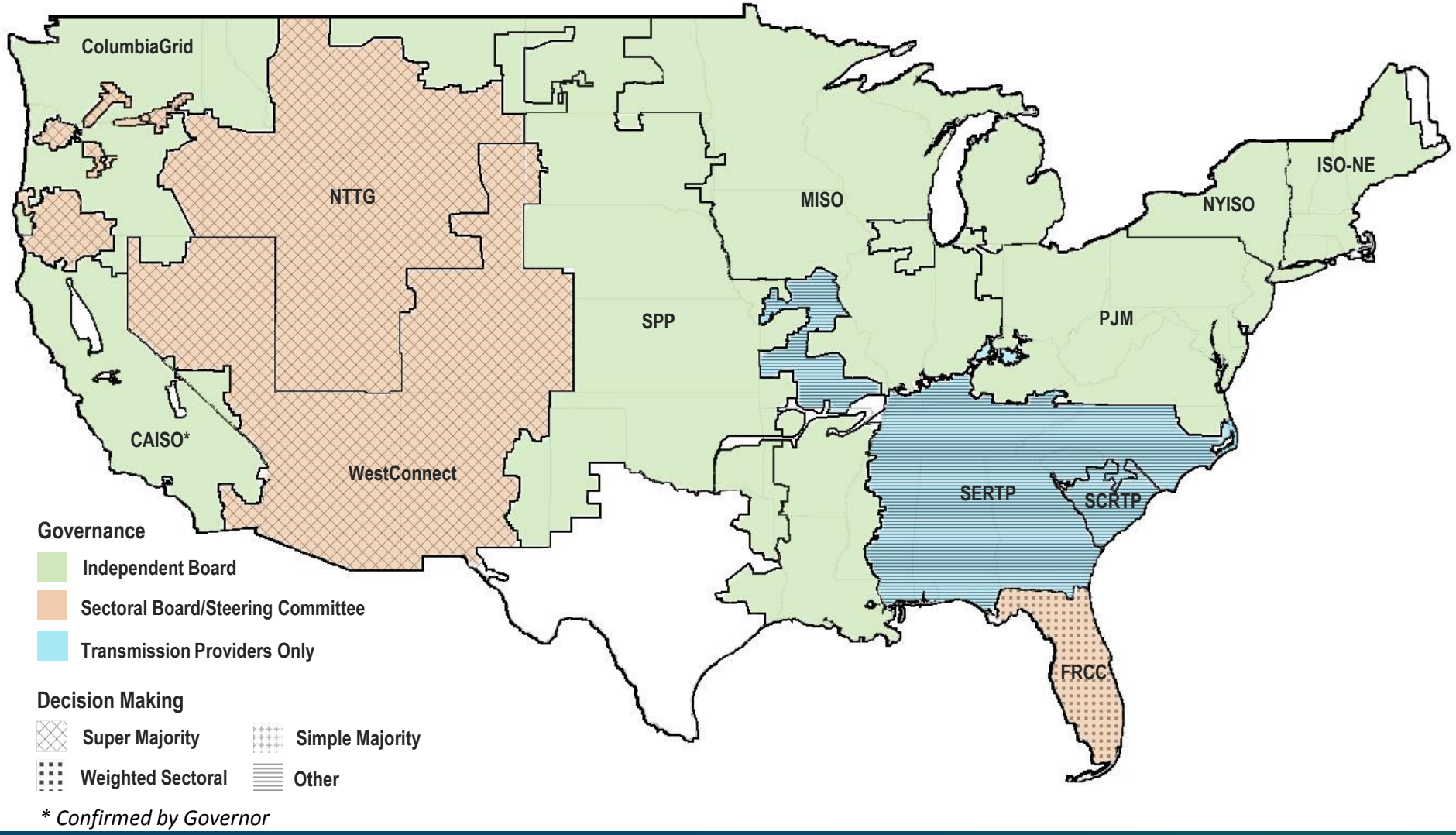

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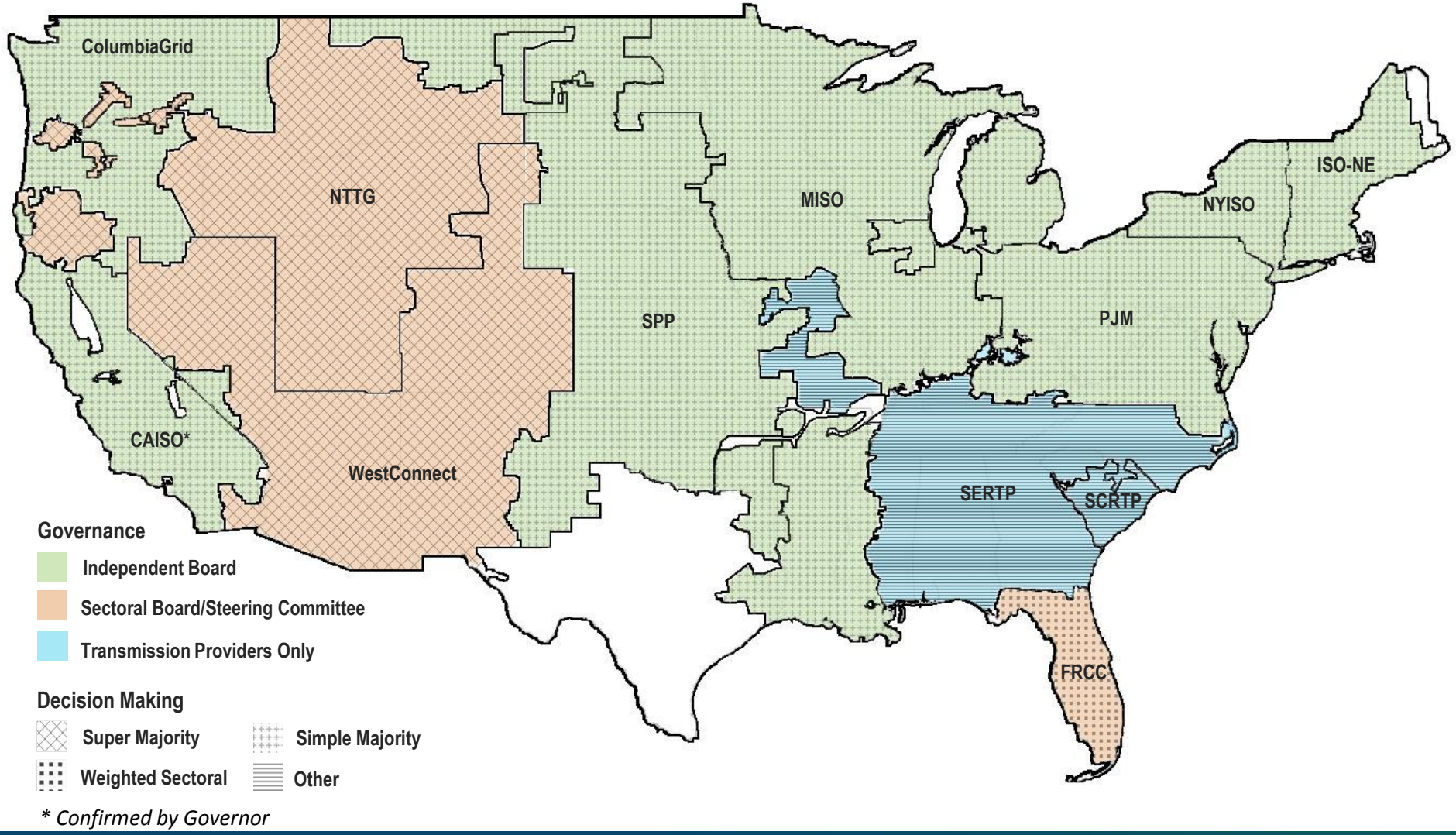

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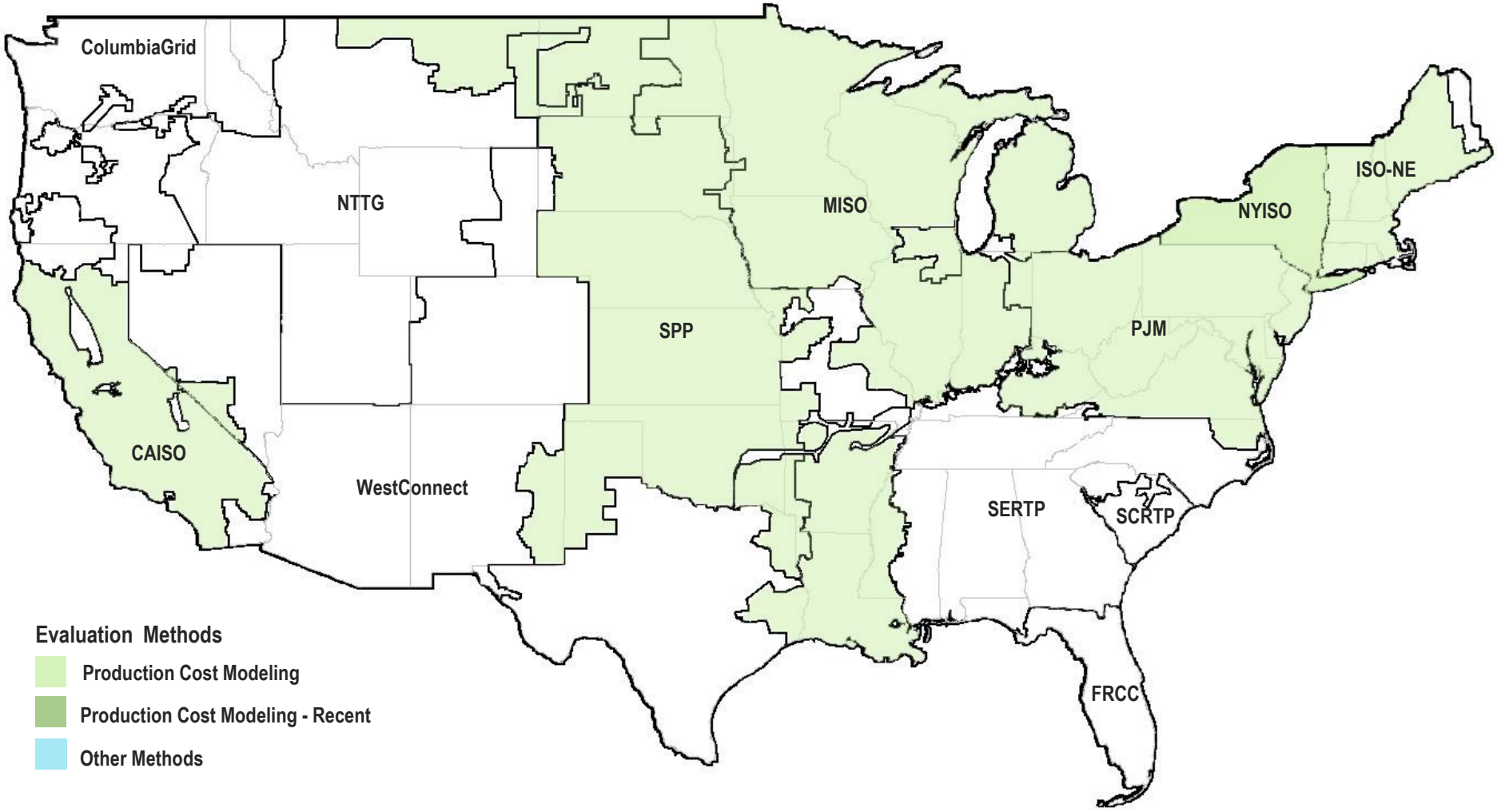
Economic Evaluation Methods



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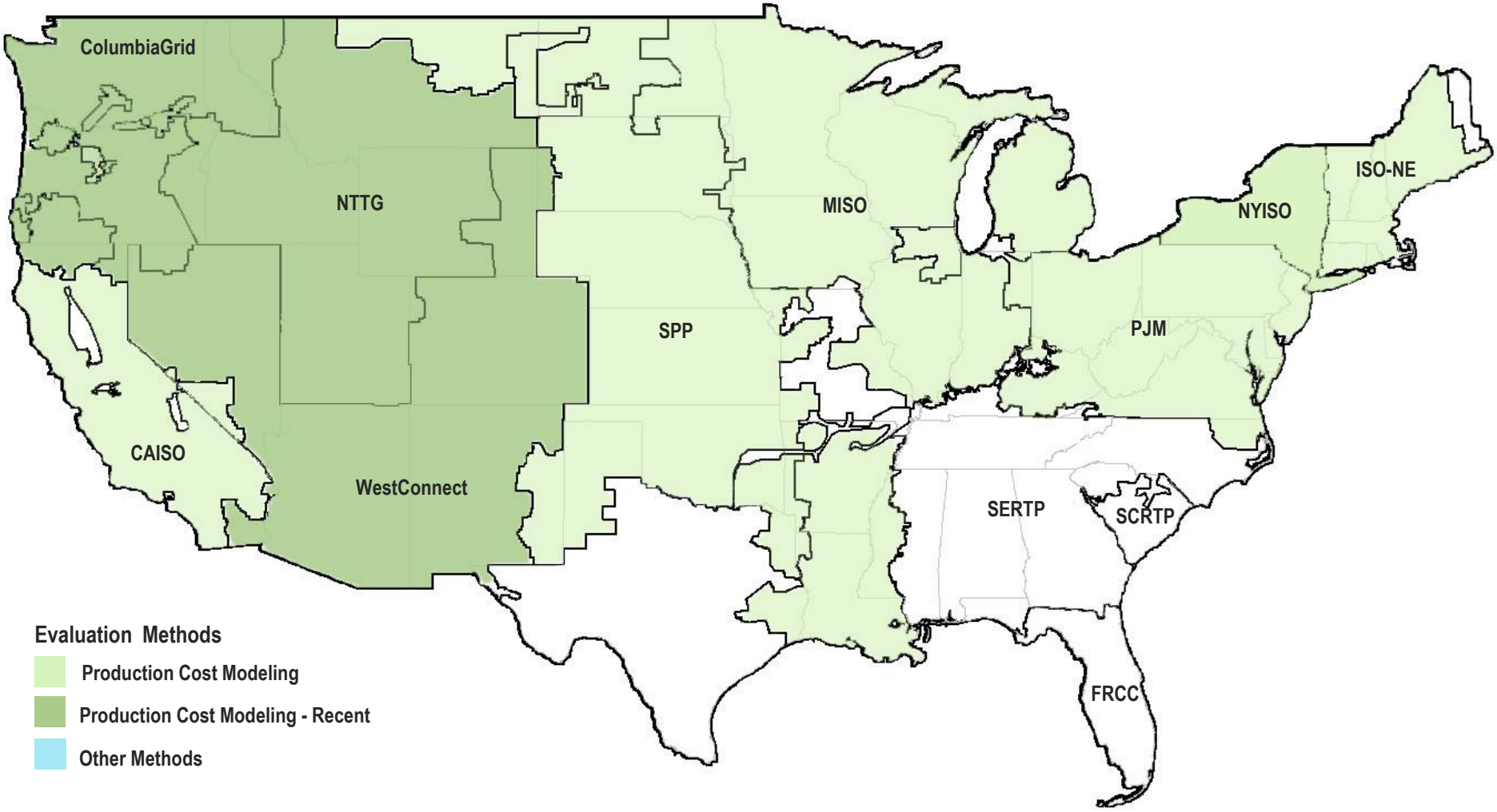

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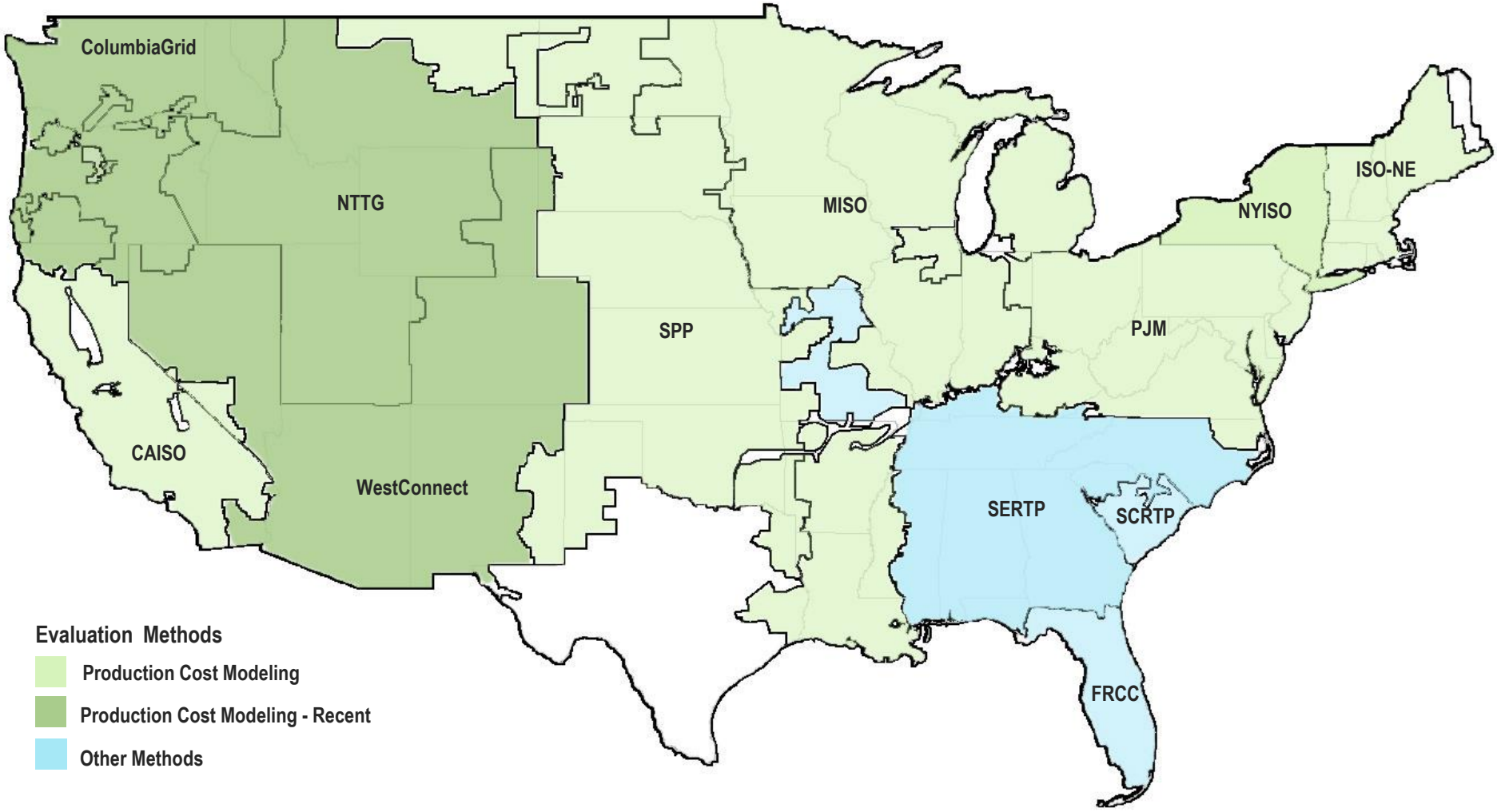
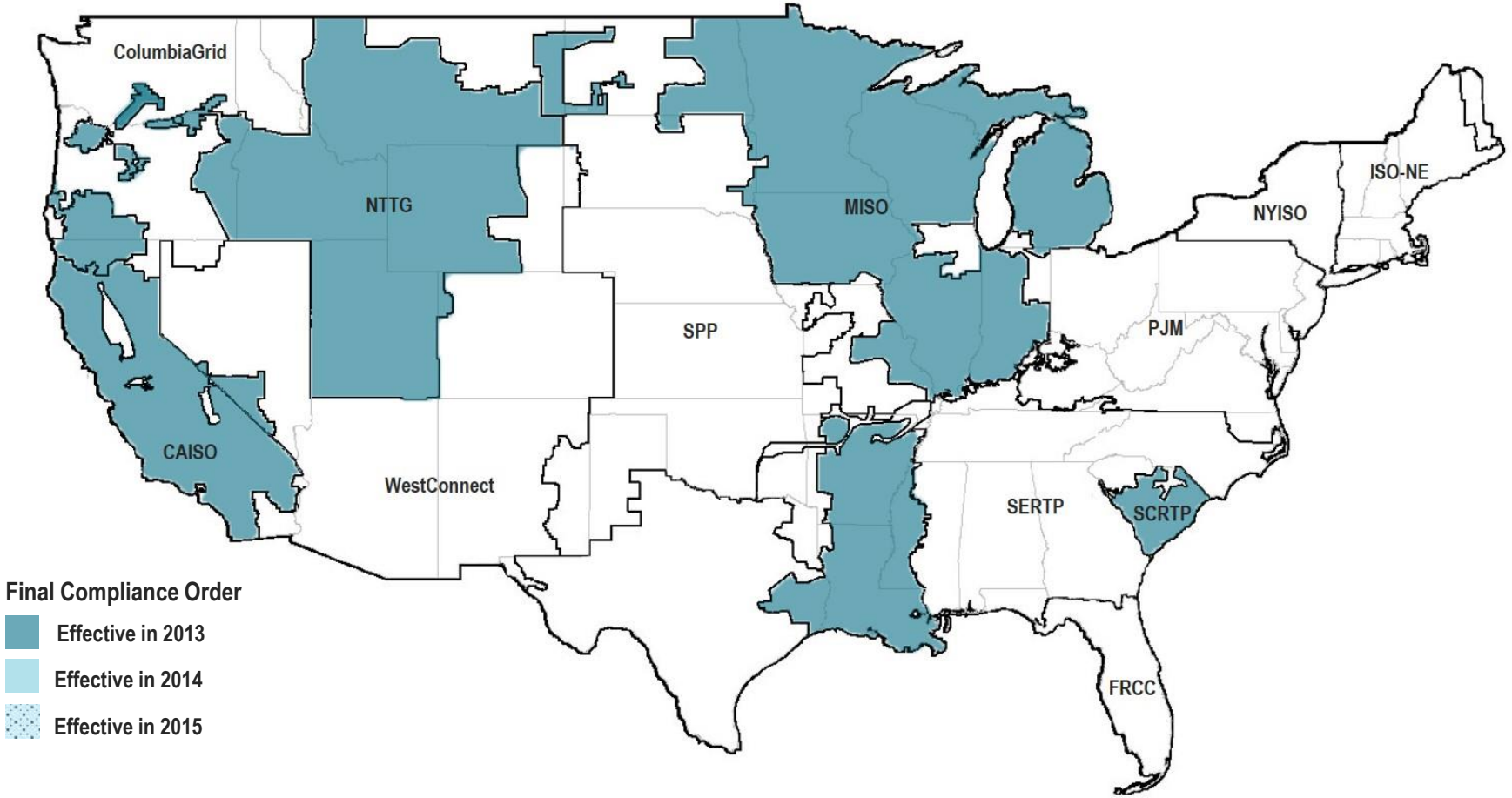


Findings

Finding 1: *It will be some time before the outcomes of FERC Order Nos. 890 and 1000 can be fully assessed.*



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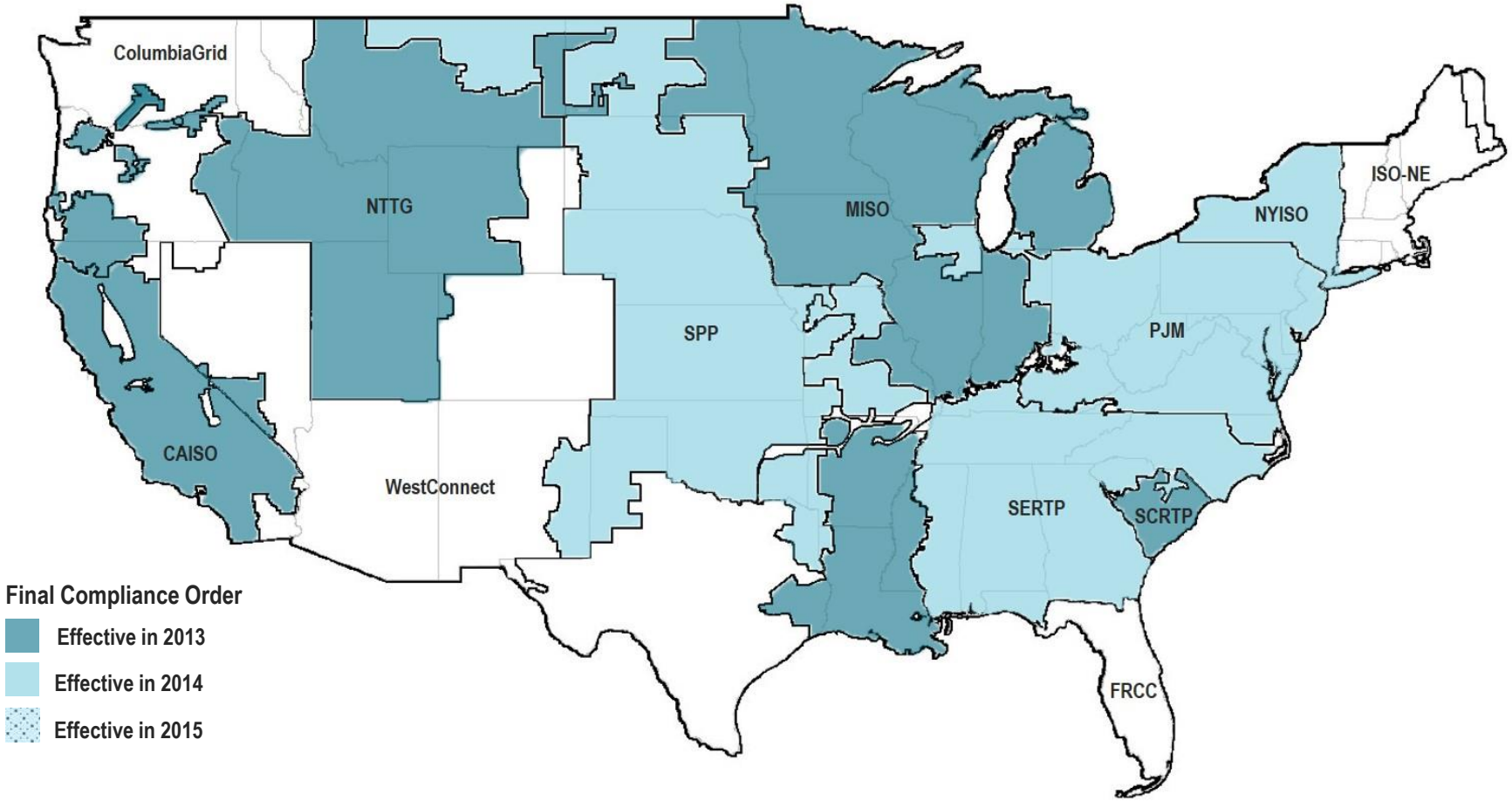

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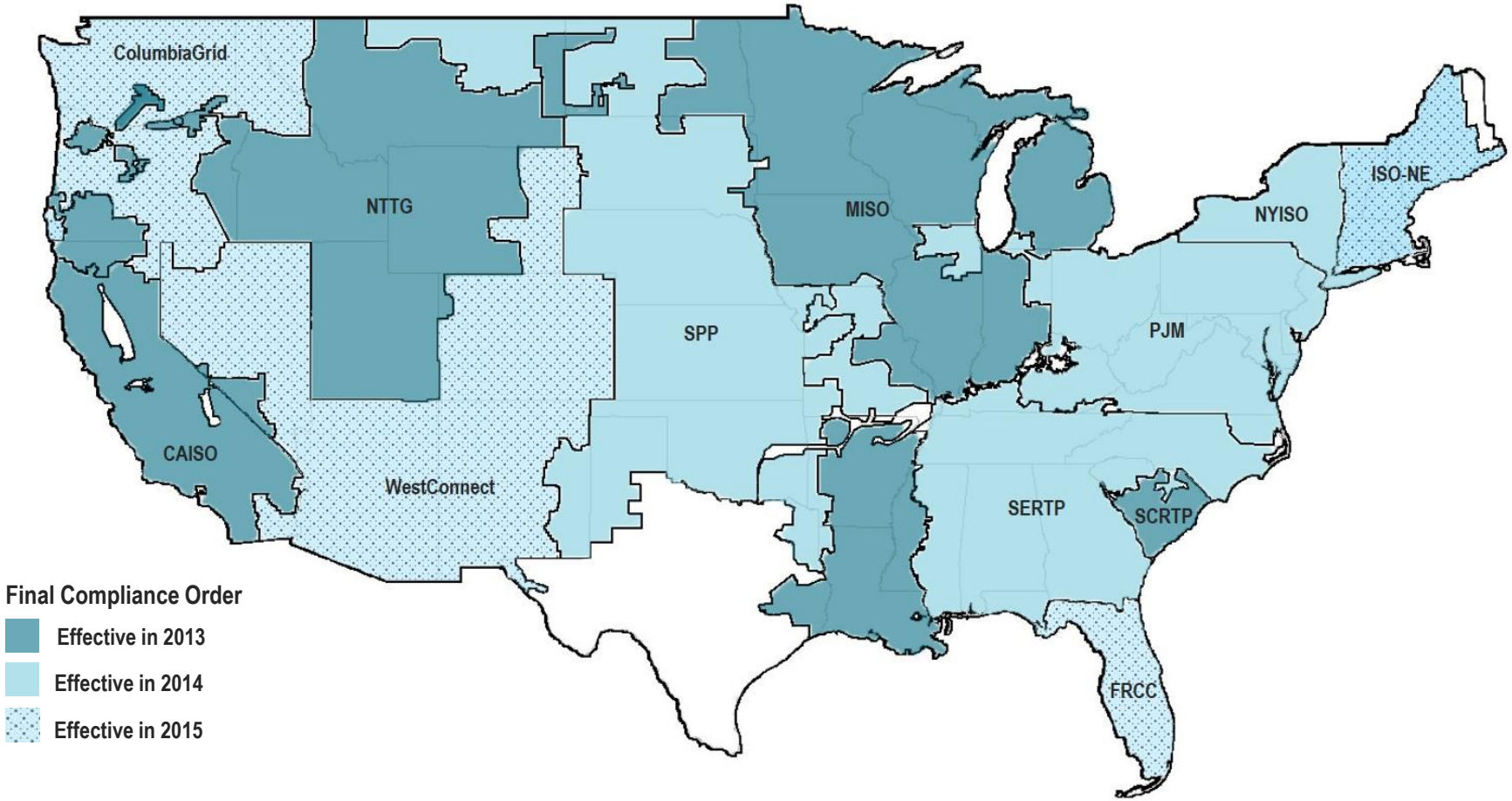

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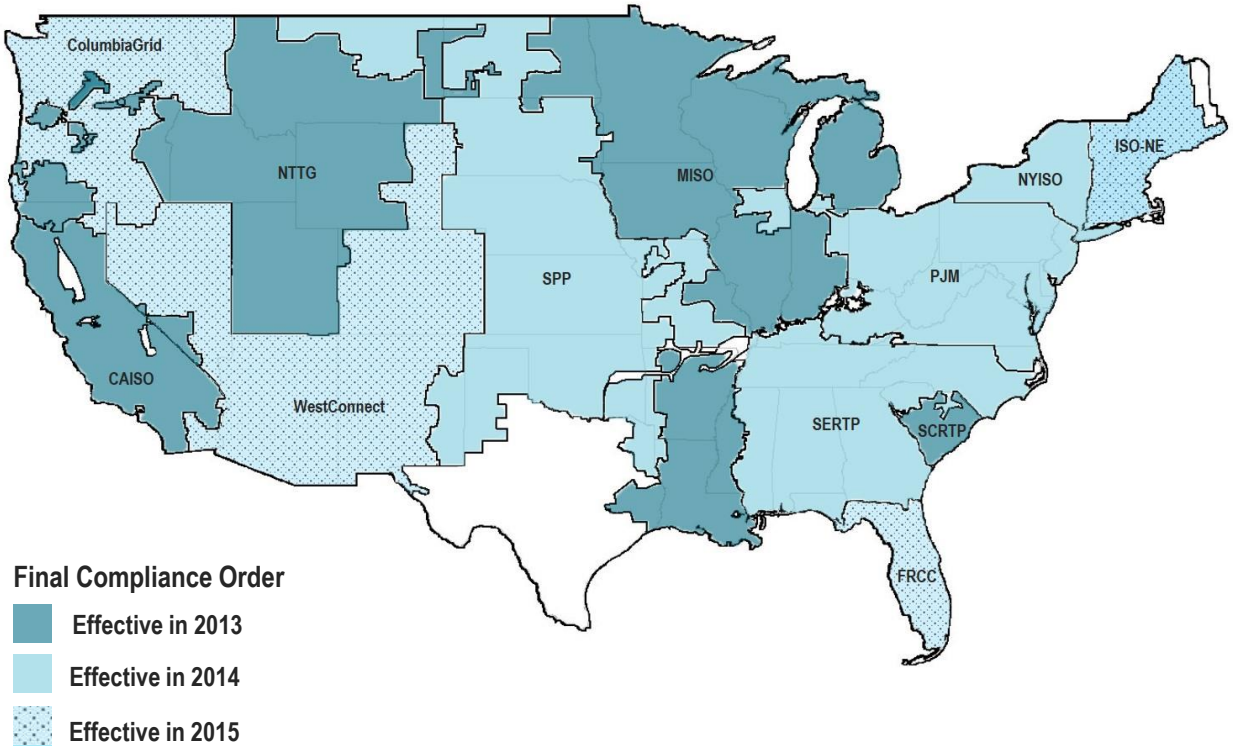
Regional Effective Dates



Interregional Effective Dates

MISO, PJM	January 2014
NYISO, ISO-NE, PJM	January 2014
SPP, MISO	March 2014
PJM, SERTP	January 2015
MISO, SERTP	January 2015
SCRTP, SERTP	January 2015
SPP, SERTP	January 2015
SERTP, FRCC	January 2015
CAISO, ColumbiaGrid, NTTG, WestConnect	October 2015

Findings

Finding 2: *Assessment of FERC Order Nos. 890 and 1000 should be based on information describing the outcomes of regional transmission planning processes, as well as costs (broadly defined) incurred by the processes that achieved these outcomes.*

Planning Outcomes	
Projects selected for regional cost allocation	For all planning outcomes: • Physical characteristics of projects • Project type (reliability, economic, public policy, regional, interregional) • Developer type (incumbent/non-incumbent) • How selection criteria were (or were not) satisfied • Project costs – proposed (actual, if appropriate)
Projects proposed but not selected for regional cost allocation	
Projects not proposed for regional cost allocation but evaluated as alternatives to project that were proposed yet not selected for regional cost allocation	

Findings

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Planning Processes	
Economic and related benefits	• Benefits considered/evaluation methods (e.g., use of production-cost modeling tools) • Consistency of modeling assumptions with other planning activities, including sub-regional and interregional activities (also applies to reliability analysis) • Treatment of uncertainty
Process-related costs	• Project selection process steps/staffing requirements/ schedule • Number of/time commitments for stakeholder workshops/ meetings

Findings

Finding 3: *The range of transmission benefits considered varies widely in regional transmission planning processes, as does the means by which benefits are evaluated…*

- Benefits currently considered reflect regional agreements and involve stakeholder input

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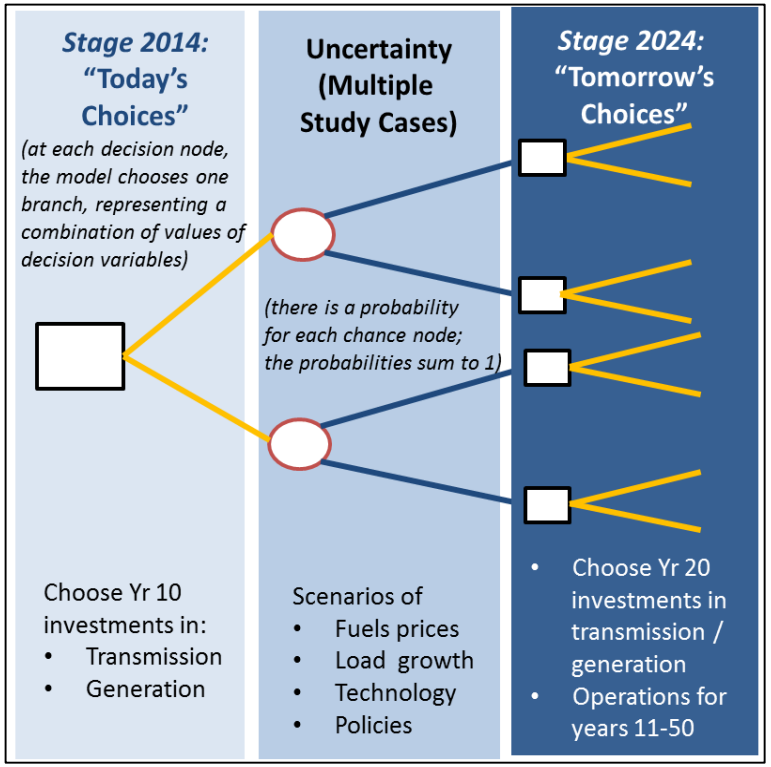
— Benefits currently considered reflect regional agreements and involve stakeholder input

…Moreover, the consideration of transmission benefits is an evolving practice among regional transmission planning entities

— Regions can learn from each other; academics may have contributions to offer



Conclusions

- FERC Order Nos. 890 and 1000 have significantly changed the manner and form of regional transmission planning by creating open and transparent transmission planning processes.
- These processes are a powerful tool that regions can wield to address transmission needs (both within regions and with neighboring regions).
- Still, the planning process established by these FERC orders is only one means by which regional and interregional transmission needs can be met.
- The effectiveness of the planning processes established by these FERC orders will take time to assess.
- It is essential to begin establishing the record for this assessment now, to inform timely decisions on whether or how the requirements and processes might be enhanced to ensure that regional needs are met efficiently and cost effectively.

- Contact: jheto@lbl.gov
- Building Electric Transmission Lines: A Review of Recent Regional Transmission Plans: *https://emp.lbl.gov/publications/building-electric-transmission-0*
- Building Electric Transmission Lines: A Review of Recent Transmission Projects: *https://emp.lbl.gov/publications/building-electric-transmission-lines*