Regional Energy Markets:

Do Inconsistent Governance Structures Impede U.S. Market Success?

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Synapse Energy Economics prepared the body of this report.

Contents

Introduction

As state and federal policies continue to drive further development of technologies such as energy efficiency, demand response, and distributed generation (including solar PV), the role these resources play in wholesale U.S. electricity markets—which are managed by Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs)—is coming under increasing scrutiny. Rules and procedures that govern these markets can have a significant impact on the extent to which the full range of energy resources ("alternative resources" in ISO New England parlance) can participate.

E4TheFuture commissioned this paper from Synapse Energy Economics because we believe that regional markets can—and should—explicitly incorporate new cost-effective energy technologies both in the market procurement process and in market governance structures. Our goal was simply to identify the governance structure in each energy market overseen by an ISO/RTO (generally the same organization with dual roles). While the paper is strictly a factual analysis, it demonstrates a lack of common approach to governance and/or market inclusion of particular energy resources. This policy status results in a barrier to the best U.S. resource procurement and planning process that inhibits the lowest cost electricity system.

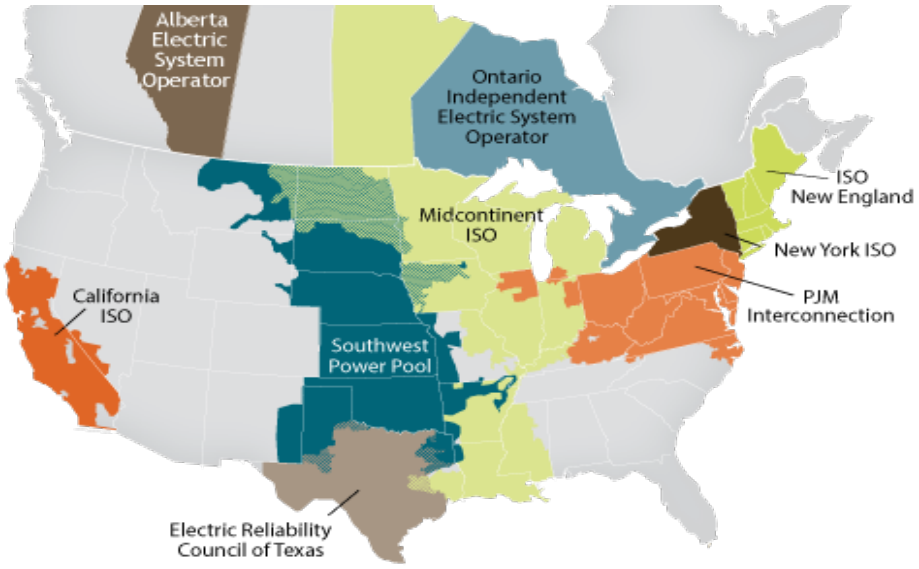
In Order 1000, issued in 2011, the Federal Energy Regulatory Commission (FERC) mandated planning authorities to evaluate non-transmission alternatives on a comparable basis when reviewing transmission solutions from incumbent and non-incumbent providers (paragraphs 148-150, 152, 155). But although the FERC sent a strong signal that "alternative resources are coming," Order 1000 was a planning exercise. It did not provide an ongoing seat at the table for the full range of energy constituent representation. When alternative market players are excluded from ISO/RTO markets and governance systems, their ability to participate effectively in ISO/RTO planning processes as stakeholders for non-transmission alternatives is severely compromised.

We hope the information presented below can inform policy-focused organizations to participate in FERC dockets with a unified voice. Such an effort may enable stakeholders to replicate and enhance prior successes.

RTO Governance and Clean Energy

By Synapse Energy Economics

Two thirds of the load in the United States is now served by a Regional Transmission Organization (RTO) or Independent System Operator (ISO), and tens of billions of dollars are exchanged under the wholesale electric market rules that these entities design and administer (see graphic below).[1] Each RTO or ISO has its own governance structure, which includes some form of participation by stakeholders in the review and development of market rules, system planning processes, and other RTO or ISO business. While many allow the public to participate in RTO/ISO business activities, most restrict who can fully participate in the stakeholder process by establishing paid membership requirements and allowing voting by members only.



Source: IRC

Nearly all of these entities follow a process in which proposed changes are identified by the RTO/ISO or by stakeholders, the issue is reviewed and discussed in dedicated committees or working groups comprised of interested parties, a potential solution (or set of solutions) to the problem is developed, and, if there is consensus around the solution, it is brought before the RTO/ISO governance body. Eventually, all changes must be filed with the FERC for their approval, except in Texas.

In this brief, we summarize the basic governance structure of each RTO/ISO and explain how clean energy resources such as utility scale wind and solar, energy efficiency, demand response, and distributed behind-the-meter (BTM) resources participate as stakeholders in the governance of the RTO or ISO.

The structure of each region is unique, and the arcane histories behind the current structures can only be fully understood after years of participation in the stakeholder process. Any change to these structures would have to involve multiple changes to integrated parts of that structure, involving complex and difficult negotiations.

[1] The southeast and much of the west are not governed by RTOs or ISOs (though western states/utilities are currently exploring the potential to expand the California ISO into a regional entity); electricity systems in these regions are managed by individual utilities or utility holding companies.

Independent System Operator of New England

ISO New England Inc. (ISO) is the not-for-profit corporation responsible for the reliable and economical operation of the electric power system that spans the six New England states. It manages the flow of power from more than 350 generation stations over 8,500 miles of transmission lines to more than 6.5 million end-use customers.

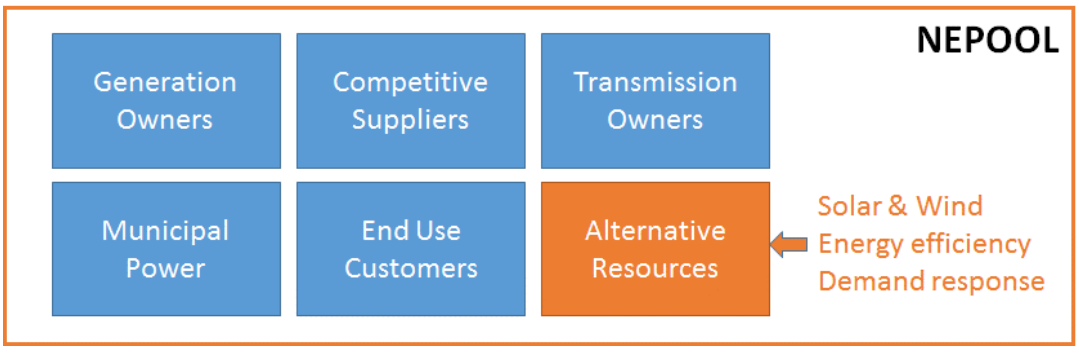
New England's stakeholder group is unique in two ways. The first is that the stakeholder group has an official organization called NEPOOL (from "New England Power Pool") that is a distinct organization from the ISO New England. NEPOOL is a self-funded entity and works through a number of committees and working groups to identify and develop solutions for a variety of market and system planning issues. The lead committee – the NEPOOL Participants' Committee – votes on items that have been supported at the lower committees. ISO New England participates in and organizes the NEPOOL process but does not have a vote.

NEPOOL retains its own law firm that represents the organization, submits its own FERC filings, and negotiates with the ISO. To our knowledge, no other similar structure exists elsewhere. Through this organization, stakeholders have leveraged unique powers, such as the ability to force the ISO New England to submit a "jump ball" filing. A jump ball filing occurs when the ISO fails to receive the support of NEPOOL, which instead supports a competing proposal, but ISO chooses to file its proposal at the FERC anyway. These jump ball filings submit two competing proposals to the FERC, both with full Federal Power Act section 205 rights. ISO must explain in its filing why its proposal is superior despite failing to receive stakeholder support.

A second unique feature in New England is that apart from the five more traditional sectors – Generation Owners, Transmission Owners, Municipal power companies, End Users, and Suppliers – there is a sixth sector dedicated specifically to clean energy resources. In 2005, as part of a major re-organization of the ISO New England into an RTO, a group of stakeholders led by Conservation Services Group negotiated the design of the Alternative Resources Sector. The AR sector is comprised exclusively of providers of renewable energy, energy efficiency, demand response, and distributed generation (though these resources aren't restricted to this sector). The AR sector holds one-sixth of the sector-weighted vote on all proposed changes to the tariff.

Like the other five sectors, the AR sector has an officer that represents them in setting committee agendas and gets private meetings twice yearly with state public utility commissioners and the ISO Board of Directors. The officer also represents the sector on the Joint Nominating Committee – the group that chooses new members of the Board.

While the interests of renewable energy resources, such as wind developers, may sometimes differ from those of energy efficiency or demand response providers, they clearly hold unique, shared perspectives that are often in stark contrast with owners of central station power plants, such as those in the Generation sector. With the AR Sector, this perspective is not diluted by those parties. The image below shows the six NEPOOL stakeholder sectors, highlighting the AR sector where clean energy resources have their own voice.

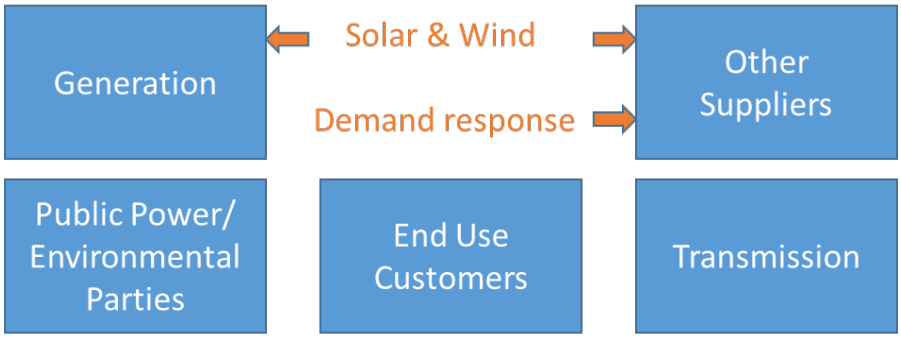


New York Independent System Operator

The New York Independent System Operator (NYISO) is responsible for maintaining the bulk power grid and wholesale electric markets for the state of New York. The NYISO manages nearly 38 GW of installed generation and serves 19.5 million customers over 11,000 miles of high-voltage transmission lines. The NYISO governance structure has three primary committees: the Management Committee, the Business Issues Committee, and the Operations Committee. The decisions of the Business Issues and Operations committees can be appealed to the Management Committee for further process. The decisions of the Management Committee can be appealed to the NYISO Board. To become a Member, an entity must qualify to participate in one of the sectors or sub-sectors, sign the NYISO Agreement, and pay appropriate membership dues. All Members of NYISO are entitled to attend meetings, present motions, and vote. The NYISO Board, the FERC, and the NY PSC may assign representatives to attend and participate as non-voting members of the Management, Business Issues, and Operations committees.

NYISO stakeholders are divided into five sectors: Generation, Other Suppliers, Transmission, End-Use Customers, and Public Power/Environmental Parties. The voting weight of each sector is specifically defined in the ISO Agreement that all members sign as a condition for formal participation. The Generation and Other Supplier sectors each count for 21.5 percent of the total votes; the Transmission Sector counts for 20 percent of the total vote. In these three sectors, each Member has a single, equal vote. The End User sector counts for 20 percent of the total vote, but the sector is divided into four subsectors with specific weightings. The Large Consumer subsector counts for 9 percent of the total vote; the Small Consumer subsector counts for 4.5 percent of the total vote; the Governmental Agency subsector also counts for 4.5 percent of the total vote, but that is split into two additional subsectors with 2.7 percent of the total vote allocated to the Consumer Advocate and 1.8 percent to Other Government Agencies. The Municipal/Environmental Parties sector account for 17 percent of the total vote divided among three additional subsectors: Public Power Authorities have 8 percent of the total vote; Municipals and Co-operatives have 7 percent of the total vote; and Environmental parties have 2 percent of the total vote.

Solar and wind resources would be eligible to participate in the Generation or Other Suppliers sector. Demand Response resources are eligible for the Other Suppliers sector.

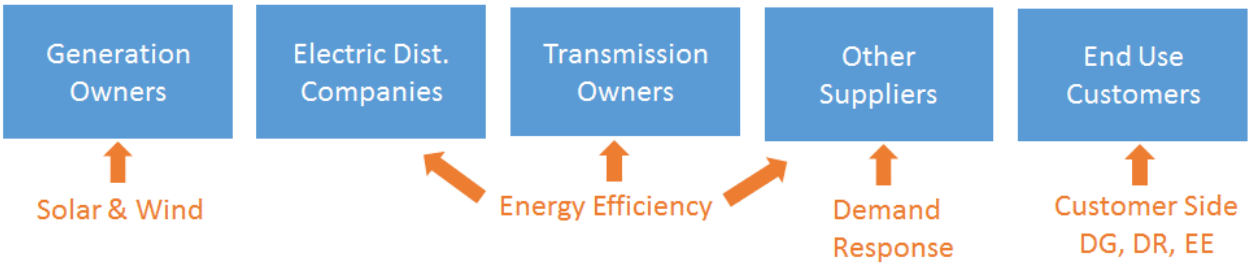


PJM Interconnection

The PJM Interconnection is an RTO covering parts of 13 states and Washington D.C. With over 180 GW of installed capacity serving more than 60 million customers over close to 63,000 miles of transmission lines, PJM is one of the largest RTOs in the United States.

The PJM stakeholder process has five official sectors: Generation Owners, Other Suppliers, Transmission Owners, Electric Distributors, and End-Use Customers. Each sector must have at least five members. Unlike in New England, there is no specific sector dedicated to clean energy resources.

Renewable energy owners are members of the Generation Owners sector, along with owners of all other types of traditional power plants. Providers of energy efficiency can choose from one of several sectors. If the energy efficiency provider is a state-funded program administrator that is also the local distribution company, they can join the Transmission Owners or the Electric Distributors. Otherwise, they can become members of the Other Suppliers sector. To the extent that large end use customers are installing their own DG, DR, or EE, there may be some advocacy for these resources from that sector, as well. DR providers are only allowed to be in the Other Suppliers sector, along with a multitude of competitive supply companies who are not providers of DR.



Each Member chooses the sector in which they would like to represent themselves, as determined by their "Active and Significant Business Interests" though representation in a sector is ultimately determined at PJM's sole discretion. In the PJM stakeholder process, clean energy providers have their perspectives muted by traditional power generation owners in the Generation Owners sector, traditional distribution companies whose interests lie more in transmission investment in the Transmission Owners and EDC sectors, and the multitude of generation owners and energy traders in the Other Suppliers sector.

Proposals are brought before stakeholders through the relevant committees and, if approved, are brought before the primary stakeholder group: the Members Committee. Pending motions can be approved by a 75 percent sector-weighted vote of the members present at the committee meeting, where each sector gets a 20 percent share of the vote.

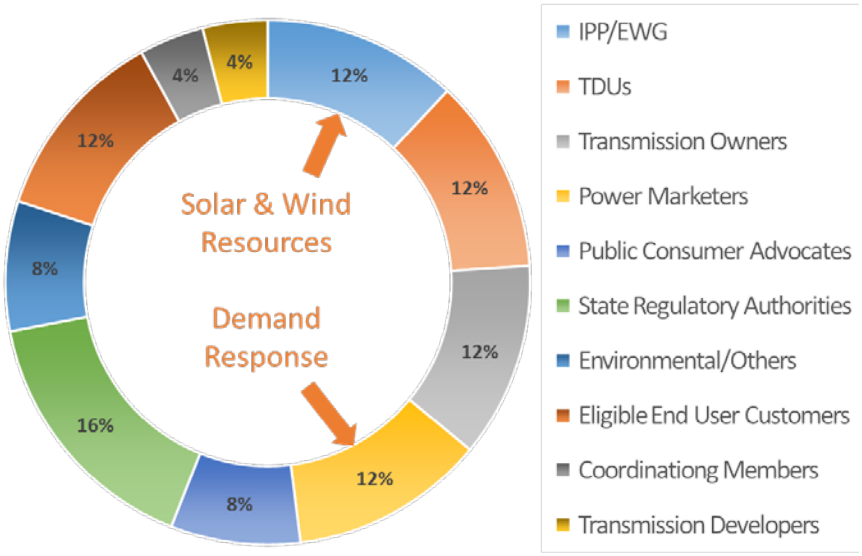
One additional avenue for participation in PJM is through what are called User Groups. Any five or more Members sharing a common interest may form a User Group and upon a 75 percent affirmative vote of the User Group may bring any item before the Members Committee. If the Members Committee does not approve the motion, the User Group may—upon a 90 percent vote—choose to raise the item with the PJM Board for its consideration. If the PJM Board agrees with the User Group's petition and finds that the current tariff creates unjust or unreasonable rates, the Board has the authority to petition the FERC directly for the change. Some User Groups form around a single issue, while others represent ongoing concerns. One such active, on-going User Group is the Public Interest and Environmental Organization User Group, or PIEOUG, which has been influential for several years. However, User Groups do not have any voting rights, only the right to put motions before a committee and, potentially, before the PJM Board.

Mid-continent Independent System Operator

The Mid-continent Independent System Operator (MISO) is a FERC-approved RTO that covers all or parts of fifteen states and the province of Manitoba, Canada. MISO manages the largest regional system in the U.S. with over 200 GW of capacity and more than 65,000 miles of transmission serving 48 million customers.

The MISO stakeholder process is comprised of an Advisory Committee that makes recommendations to the MISO Board of Directors. The Advisory Committee is assisted by six subcommittees and numerous working groups and task forces associated with each subcommittee. The Advisory Committee has ten sectors that vote to approve changes related to market, reliability, and operational issues. These sectors are: Transmission Owners (Vertically Integrated Stand-Alone Transmission Companies), Coordination Member, Power Marketers, Independent Power Producers / Exempt Wholesale Generators (IPP/EWG), Municipals/Cooperatives/Transmission-Dependent Utilities (TDU), End-Use Customers, Environmental Groups, State Regulatory Authorities, Public Consumer Groups, and Competitive Transmission Developers.

The Advisory Committee uses sector-weighted voting. For Advisory Committee approval, a properly noticed motion requires a majority of the sector weighted votes (normalized for abstentions). Motions that are not properly noticed require an affirmative two-thirds of the sector weighted votes. Even if a motion fails to receive approval from the Advisory Committee, MISO can file its proposal with the FERC anyway. The table below shows the sector-weighted voting for the Advisory Committee.



The IPP/EWG sector is for Independent Power Producers and Exempt Wholesale Generators. The TDU sector is for transmission dependent utilities such as municipals and co-operatives. Clean energy resources such as wind and solar participate in the Independent Power Producer sector. Demand Response and energy efficiency resources do not have a specific sector, nor do other distributed generation technologies. However, anyone can join MISO and be assigned to the “Other” section of the Environmental/Other Sector, which serves as a catch-all for stakeholders that don’t fit particularly well in any other sector. For instance, competitive transmission providers originally joined MISO as Other stakeholders until a new sector (Transmission Developers) was created.

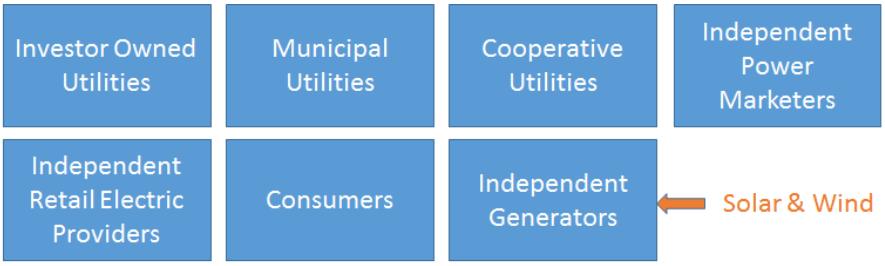
Other subcommittees, working groups and task forces have the option of selecting sector-weighted voting or one vote per eligible member. The Charter for each subcommittee, working group, or task force will identify the voting method for that group.

Electric Reliability Council of Texas

The Electric Reliability Council of Texas (ERCOT) is unique among the other RTOs and ISOs because it is not subject to the jurisdiction of the FERC and it is an electrically distinct region with only minimal connections to other control areas. ERCOT is subject to the primary jurisdiction of the Public Utility Commission of Texas (PUCT) and, because the PUCT is a state agency, subject to the indirect control of the Texas Legislature. This single-state ISO is responsible for managing more than 84 GW of installed generation and 40,000 miles of transmission lines to serve its 23 million customers.

The ERCOT stakeholders comprise seven segments (sectors) that form the Technical Advisory Committee (TAC). The seven sectors are: investor-owned utilities, municipal utilities, cooperative utilities, independent generators, independent power marketers, independent retail electric providers, and consumers. Meetings are open to the public, but only corporate members are allowed to vote at the TAC.

Wind and solar resources can participate as independent generators. Demand response, energy efficiency, and distributed generation resources are not specifically defined in the bylaws and do not officially participate in the ERCOT stakeholder process; however, a corporate member may designate a non-corporate member (such as a demand response or energy efficiency provider) to attend and vote at a lower committee or working group and this has happened on occasion.



The TAC makes recommendations to the ERCOT Board of Directors regarding ERCOT policies and procedures and is assisted by five stakeholder subcommittees. The five subcommittees (and related task forces and working groups) develop proposed rules and procedures for retail and wholesale markets, reliability, and commercial operations. There is also an ERCOT Executive team that is responsible for the daily operations, coordination, and planning for the region.

The TAC has 30 members (Representatives). Each sector selects its own representatives by simple majority vote of the sector or sub-sector. The Consumer sector has six Representatives (two Commercial, two Industrial, and two Residential); the other six sectors have four Representatives each. Voting procedures at the TAC are complicated, but in essence, each TAC member votes based on the majority vote of sector members in attendance at that TAC meeting (including proxies). Each TAC Representative has one vote. For motions to pass, they must receive affirmative votes from two-thirds of the eligible TAC Representatives (including proxies) and affirmative votes of fifty percent of the TAC Representatives in the room. Motions that pass the TAC are then presented to the ERCOT Board of Directors.

The ERCOT Board of Directors has sixteen members: nine stakeholder members, five unaffiliated members, ERCOT's CEO, and the PUCT Chairman (non-voting). Of the nine stakeholder members, three are from the Consumer sector and there is one from each of the other six sectors. The five unaffiliated members (independent of any ERCOT participating stakeholders) are selected for particular corporate expertise in finance, markets, utility operations, law, engineering, and other professions. Actions by the Board of Directors require a two-thirds affirmative vote of eligible Directors (abstentions not counted) and at least 50 percent of all seated Directors. Some matters are the exclusive jurisdiction of the PUCT, and those matters do not come before the Board.

Southwest Power Pool

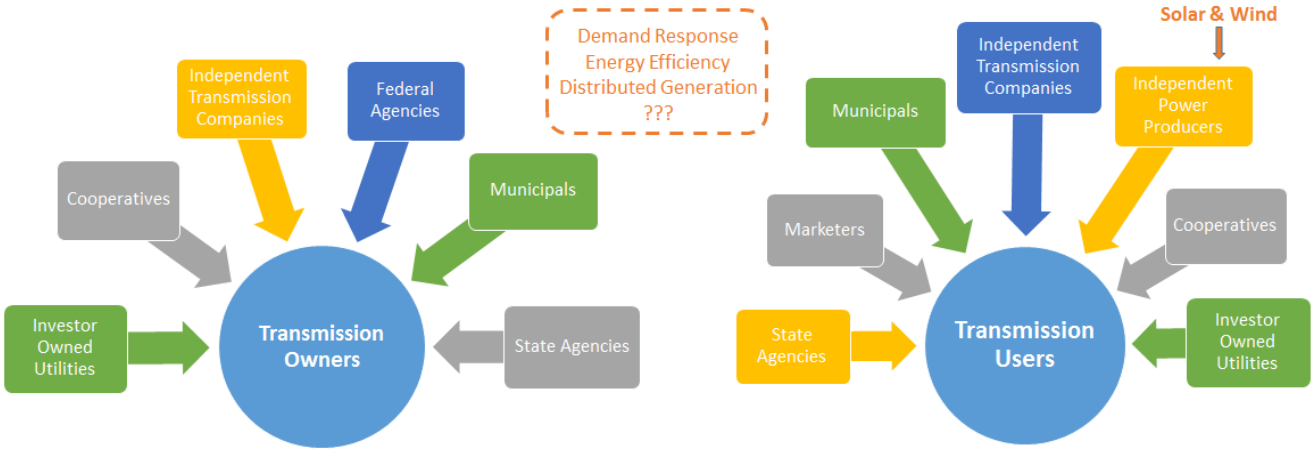
The Southwest Power Pool (SPP) is an RTO that oversees the bulk electric grid and wholesale power market across parts of fourteen states in the central part of the U.S. SPP manages more than 60 GW of capacity, flowing over 60,000 miles of transmission lines to serve approximately 18 million customers.

Decision making at SPP is influenced through an open stakeholder process in which SPP members and non-members can participate and express concerns or promote ideas. Being an SPP member entitles an entity to voting privileges and decision-making rights as a participant in select Organizational Groups (similar to other RTOs' committees and working groups). Despite this, SPP has fewer than 100 members who are grouped into the following categories: Cooperatives, Independent Power Producers, Federal Agencies, Independent Transmission Companies, Investor Owned Utilities, Marketers, Municipals, State Agencies, and SPP Contract Participants (a control area within SPP). Certain clean energy resources, like wind energy providers, are included in the Independent Power Producers category. One deterrent to membership may be the withdrawal penalty that must be paid by any Member that withdraws (voluntarily or otherwise) from SPP. This penalty represents a percentage of the entire principal amounts of all outstanding SPP Financial Obligations, for which each Member must accept responsibility as a condition of signing the Membership Agreement. One representative we spoke to at SPP estimated that the current withdrawal fee is around $1 million.

Most Organizational Groups report to the Markets and Operations Policy Committee. For voting purposes, SPP divides members into two sectors—Transmission Owning Members and Transmission Using Members—for matters before this committee. Each sector votes separately with the result for that sector being a percent of approving votes to the total number of Members voting. An action is approved if the average of these two percentages is at least sixty-six percent. If no Members are present within a sector, the single present sector voting ratio will determine approval.

The SPP Board of Directors appoints representatives to each of the Organizational Groups and each representative gets one vote. In the Organizational Groups, a simple majority of participants present shall be required for approval of an action. The Chair of each Organizational Group is also appointed by the Board; however, the vice-chairs are elected by the members of that group. Criteria for serving on an Organizational Group is determined in the group's scope. If an SPP Member or group of Members disagree on an action taken or recommended by any Organizational Group, they may submit an appeal and an alternate recommendation to the Board of Directors.

In theory, energy efficiency and other types of load management providers could become members of SPP in order to gain the right to vote on proposals in stakeholder committees, though it is unclear which sector these resources would fit into and currently there do not appear to be any SPP members of this type. There are several wind energy companies in the Independent Power Producer category.



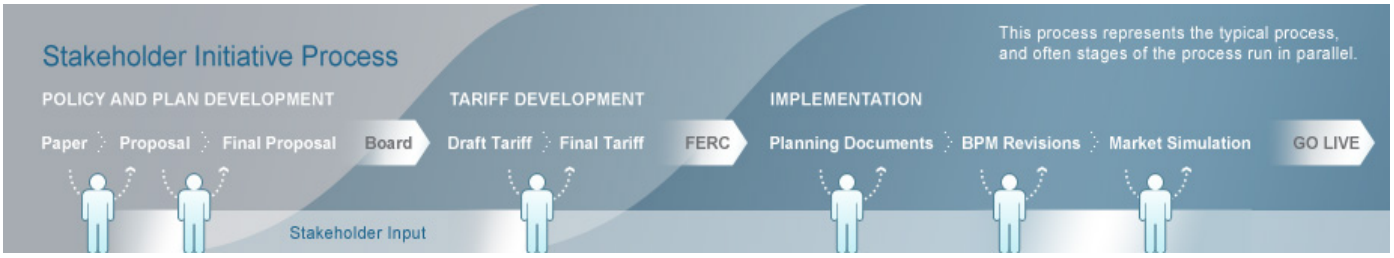
California Independent System Operator

Like NYISO and ERCOT, the area over which the California Independent System Operator (CAISO) has control is contained within a single state. This gives considerably more influence to state political entities, such as the California Public Utilities Commission and the California Energy Commission, than is generally the case in ISOs. The CAISO serves approximately 30 million Californians via an electric system capable of producing more than 57 GW of electricity and sending it out over 26,000 miles of high voltage transmission lines.

In California, the CAISO stakeholder process is very similar to the standard administrative process of a government agency. CAISO staff or stakeholders identify an issue, CAISO releases an issue paper or a straw proposal for addressing the problem, stakeholders review and comment on the proposal, CAISO reviews comments and makes any changes it feels are required, then the final proposal is sent to the Board of Governors. The Board, which is appointed by the Governor, is responsible for reviewing and approving grid planning and market design changes, as well as the annual ISO budget and other ISO policies. If tariff changes are made, the Board submits those changes to the FERC after stakeholders have had a chance to review and comment on the changes.

There is no official membership structure in CAISO and there are no limitations on who can be a stakeholder. Meetings are open to the public. In order to participate, one must simply monitor the appropriate committees and working groups where issues of relevance are raised and developed. This means that energy efficiency providers, renewable energy developers, and other clean energy resource advocates can all participate on reasonably equal footing to other interested parties; however, there is no formal voting process and the final word on all CAISO matters belongs to the Board of Governors, no matter what stakeholders want. When it considers a proposal, the Board does hear from both proponents and opponents of the proposal before making a decision. If a stakeholder does not like the final decision of the Board, it can pursue the issue at the FERC, if appropriate.

The following diagram from CAISO's website illustrates the stakeholder process on a variety of potential CAISO actions:



Summary

It is important to note that all of the stakeholder processes described above are advisory to their respective RTO/ISO. The “independence” that the FERC requires to approve an RTO/ISO includes independence from market participants (stakeholders). The FERC intends for the stakeholder process to be an initial vetting of issues that eventually come to the FERC (except in Texas) as consensus or disputed filings that the FERC approves or rejects. In many instances, the FERC will not consider complaints that have not been vetted and voted upon in the relevant stakeholder process. The voting thresholds in each stakeholder process require super-majorities in almost every situation. Because of the multiple industry sectors, proposals require coalitions and compromises to achieve even a simple majority vote in support. This makes it easier to prevent change than to achieve change – an intentional feature for an industry that proceeds slowly and cautiously in everything that it does. The goal is to force stakeholders to wrestle through the details at the working group/subcommittee level and develop consensus proposals for the official voting committees (except in California) and ultimate filing with the FERC by the RTO/ISO. ISO New England appears to be unique in both its inclusion of a sector exclusively for alternative resources, and in its stakeholders’ ability to make competing FPA Section 205 filings to the FERC.

Conclusions

E4TheFuture hopes that this report will help inform policy focused organizations to work together in an effort to reform and improve the governance structures and market rules, to insure that all the interests in our energy markets are heard and included. Current confusion around interregional variations in structures and rules make achieving a truly consistent and well-functioning energy market on a national level almost impossible. This confusion inhibits progress toward a cleaner energy system, and a more cost effective system for U.S. ratepayers. We look forward to working with stakeholders across the country to address these issues – most specifically in the Western Region, where current efforts seek expansion of the regional ISO/RTO to cover territory beyond California.

E4TheFuture: Advocating for Clean Energy Solutions

Who is E4TheFuture, and why do we care about RTO/ISO governance? E4TheFuture is a nonprofit that promotes residential clean energy and sustainable resource solutions to advance climate protection and economic fairness by influencing federal, state and local policies, and by helping to build a resilient and vibrant energy efficiency and clean energy sector. “E4” stands for energy, economy, equity, and environment.

E4TheFuture was previously known as Conservation Services Group (CSG), until the sale of its operating programs in 2015. CSG’s mission-driven direct work in support of clean energy resources (energy efficiency, demand response, renewable energy, and combined heat and power) motivated us to join with several partners to intervene in an ISO-NE docket at the FERC in 2001 (see Appendix A). The outcome was a requirement that alternative resources be included in ISO-NE governance. This in turn led to CSG’s collaboration with EnerNOC in a focused effort to establish a capacity market specifically including alternative resources. As you might expect, the result of alternative resource sector inclusion was a dramatic increase in selection of such resources to meet the region’s capacity needs, while significantly decreasing ratepayer costs. It also led to more explicit inclusion of alternative resource *projections* to modify future plans for both capacity and transmission, further reducing costs for ratepayers and demonstrating the value of clean energy resources.

For more information see www.E4TheFuture.org, or contact Steve Cowell at scowell@E4TheFuture.org.

About Synapse Energy Economics, Inc.

Synapse Energy Economics is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power sector for public interest and governmental clients. Its staff of 32 includes experts in energy and environmental economics, resource planning, electricity dispatch and economic modeling, energy efficiency, renewable energy, transmission and distribution, rate design and cost allocation, risk management, cost-benefit analysis, environmental compliance, climate science, and both regulated and competitive electricity and natural gas markets. Several of our senior-level staff members have more than 30 years of experience in the economics, regulation, and deregulation of the electricity and natural gas sectors, and have held positions as regulators, economists, and utility commission and ISO staff.

Services provided by Synapse include economic and technical analyses, regulatory support, research and report writing, policy analysis and development, representation in stakeholder committees, facilitation, trainings, development of analytical tools, and expert witness services. With regards to wholesale electricity

markets, Independent System Operators (ISO), and Regional Transmission Organizations (RTO), Synapse helps our clients remain informed and participate effectively in ISO and RTO proceedings, rulemakings, and operations. Synapse is committed to the idea that robust, transparent analyses can help to inform better policy and planning decisions. Many of our clients seek out our experience and expertise to help them participate effectively in planning, regulatory, and litigated cases, and other forums for public involvement and decision making.

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Appendix A

Historical Context: FERC and AR Sector Rulings

"On March 24, 2004, the Federal Energy Regulatory Commission (FERC) issued an order approving, with significant conditions, the creation of RTO New England (RTO-NE). One of the conditions imposed by FERC was a change to the New England Power Pool (NEPOOL) and ISO New England (ISO-NE) governance process to accommodate a new voting sector for alternative resources [AR]. This new sector had been proposed by several New England public interest organizations[1] in a filing coordinated by the Union of Concerned Scientists (UCS).

Pursuant to the FERC Order, NEPOOL convened a working group of New England stakeholders to develop a structure for this new sector. After several months of meetings and draft proposals, NEPOOL achieved a broadly supported agreement to add a sixth voting sector to the Restated NEPOOL Agreement (NEPOOL's governance document). The new AR Sector will provide an opportunity for new and small resources to participate in the NEPOOL and ISO-NE processes for developing and enhancing the wholesale electricity markets. NEPOOL's AR Sector was included as part of the settlement agreement filed with FERC in September 2004." *– excerpt from Synapse Brief, 2005*

Establishing something akin to ISO-New England's Alternative Resources sector in other RTO/ISO regions may be an issue the FERC would decide on if such a governance structure is part of the RTO's tariff. Such an undertaking would likely require broad stakeholder support, as well as the support of the RTO itself, and would involve changes to integrated parts of the RTO structure. These can be complex and difficult negotiations.

Synapse does not presume that having an AR sector is necessarily the best or only way to achieve a better voice for clean energy in each region. It has worked well in New England, due in part, we believe, to other unique elements of the ISO-New England stakeholder structure (such as the sector-weighted voting structure and the inclusion of the AR sector vice-chair on the Joint Nominating Committee for the ISO Board). Other RTO/ISO regions may have governance structures that do not accommodate this approach.

[1] In addition to UCS, the filing parties were Conservation Law Foundation (CLF), Clean Water Action (CWA), Environment Northeast (ENE), Massachusetts Energy Consumers Alliance (Mass Energy), Massachusetts Public Interest Research Group (MASSPIRG), and Pace Energy Project (Pace).

Appendix B

Summary of RTO/ISO Treatment of Clean Energy Resources in Transmission Planning

By Synapse Energy Economics

The treatment of clean energy resources, such as energy efficiency, demand response, and distributed generation, varies across different RTO transmission planning processes. Below, we briefly summarize how these resources are incorporated (or not) into system planning across the country. Additional work is necessary to determine the amounts of each of these resources that are participating in various RTO markets and the precise nature of their participation.

Furthermore, as detailed below, the ways in which clean energy resources are incorporated into system planning is changing rapidly as the penetration of these resources grows and planners are finding them harder and harder to ignore. Table 1 summarizes the treatment of behind-the-meter resources across much of the country. Further descriptions of each region follow.

The findings here do not necessarily line up with the participation of these resources in RTO/ISO governance. For instance, some regions that do not provide specific avenues for the participation of clean energy resources in the RTO stakeholder process are nonetheless beginning to forecast energy efficiency and solar PV impacts in their planning processes. We may not agree that the methodologies being used are accurately portraying the role these resources are playing in changing system needs; but the process has begun and that is a step in the right direction.

Table 1. Treatment of Clean Energy Resources in RTO Transmission Planning

	ISO-NE	NYISO	PJM	MISO	SPP	ERCOT	CAISO
Energy Efficiency	EE cleared in most recent FCA plus forecasted amount out to 10 years (heavily discounted)	Included and modeled based on assumptions in NYISO Gold Book	EE cleared in most recent BRA, plus forecasted end use efficiency out to 10 years.	Scaled to reflect state-level EE mandates and goals; MISO then nets out the impact of the EE programs from baseline demand and energy growth rates	Not explicitly modeled for planning	Not explicitly modeled for planning	Included based on forecast developed by the California Energy Commission (CEC) accounting for efficiency "reasonably expected to occur"
Demand Response	Modeled as negative load in base case based on most recent FCA results	Included and modeled based on assumptions in NYISO Gold Book	DR that has cleared the capacity auction is modeled in the base case	Scaled to reflect state-level DR mandates and goals	Not explicitly modeled for planning	Not explicitly modeled for planning	Included based on forecast developed by CEC accounting for DR "reasonably expected to occur"
Distributed Generation	All solar PV not embedded in load—resources cleared in FCA, settlement-only resources in the energy markets, and forecasted behind the meter PV—modeled as resources	NYISO is developing a 15-year solar PV forecast which may be used in transmission planning in the future	PJM has developed a DG forecast (consisting mostly of PV) that would treat DG as reduction to peak load but is still analyzing how to include it in planning studies	Scaled to reflect state-level DG mandates and goals	Not explicitly modeled for planning	Not explicitly modeled for planning	Included as peak load reductions based on forecast developed by CEC

ISO-NE

In New England, the ISO forecasts Energy Efficiency as part of the annual CELT forecast. This energy efficiency is forecasted beyond the FCM horizon, and is included separately for studies that analyze time periods beyond the FCM horizon.[2] In addition to the energy efficiency, ISO-NE includes demand response resources from the most recently concluded FCA modeled as negative load in the base case for planning studies.

ISO-NE also includes a solar PV forecast in its annual CELT Report. The forecast includes solar PV generation that has been installed as of the prior year and forecasts the PV capacity that is expected to be in-service by the end of each forecast year for the next 10 years. PV resources that are not already embedded in the CELT load forecast are modeled explicitly as generation or negative loads in the transmission planning studies.

NYISO

In New York, energy demand and system peak data is sourced from the latest NYISO Gold Book, as are assumptions on economic growth, energy efficiency program impacts, and retail solar PV impacts. They could be subject to change depending on the review process by NYISO's Energy Systems Planning Working Group (ESPWG) and the Transmission Planning Advisory Sub-Committee (TPAS). NYISO uses similar reports from neighboring systems to update the data representing those regions.

PJM

In the PJM region, the RTO produces a 15-year forecast using anticipated economic growth and weather conditions to estimate growth in peak load and demand. As part of load forecast development, PJM uses the results of its latest forward capacity auctions to adjust the unrestricted load forecast to account for demand resources and energy efficiency. This peak load forecast is then used in the development of its Regional Transmission Expansion Plan power flow models. For the first time in 2015, PJM agreed to forecast both energy efficiency and solar PV for the forecasting period. Energy efficiency is modeled as a forecast of end-use efficiency and penetration rates, rather than as a projection of state-funded EE program results, as is done in New England.

MISO

In the Midwest states, MISO forecasts include consideration of thermal units, intermittent resources, demand-side management and energy efficiency programs. The MISO Transmission Expansion Plan (MTEP) is based on utility-based forecasts required under Module E of the MISO tariff. To evaluate the potential of Demand-Side Management (DSM) within the footprint, MISO consulted with Global Energy Partners LLC in 2010. This effort led to the development of 20-year forecasts for various types of DSM for the MISO region and the rest of the Eastern Interconnection. The study found DSM programs have the potential to significantly reduce the load growth and future generation needs of the system. For MTEP15, the DSM program's magnitudes were scaled to reflect state-level energy efficiency and/or demand response mandates and goals. To calculate the effective demand and energy growth rates, which are ultimately input into the production cost models, MISO nets out only the impact of the energy efficiency programs from the baseline demand and energy growth rates. Demand

[2] The ISO generates the energy efficiency forecast based on three main factors: expected future program budgets, percent of budgets spent per year, and the cost of procuring savings from energy efficiency. The ISO's assumptions for percent of program administrators' budgets spent and annual increases in the cost of saved energy are quite conservative and lead to an energy efficiency forecast that declines steadily each year and may significantly under-forecast future efficiency savings on the system.

response programs are modeled within the production costing simulations as oil-fired generators with a significantly high fuel cost when compared to other generators.[3]

ERCOT

ERCOT does not explicitly forecast future installations of solar PV, other forms of DG, EE, or demand response. Therefore, these resource will only be accounted for in the planning process to the extent that they have reduced actual usage and peak loads in the past. Installation of behind-the-meter clean energy resources will eventually be recognized in the load forecast, but there will be a lag of several years without a specific forecasting of these resources.

SPP

Like ERCOT, SPP does not explicitly forecast future installations of solar PV, other forms of DG, EE, or demand response. Therefore, these resource will only be accounted for in the planning process to the extent that they have reduced actual usage and peak loads in the past. Installation of behind-the-meter clean energy resources will eventually be recognized in the load forecast, but there will be a lag of several years without a specific forecasting of these resources.

CAISO

In California, CAISO studies reflect future demand forecasts published in the California Energy Demand Forecasts released by the California Energy Commission (CEC). These forecasts account for reduced energy demand from energy efficiency, demand response, and distributed generation "reasonably expected to occur."

For energy efficiency, the CEC's baseline forecast includes only energy efficiency considered "committed."[4] The forecast divides event-based demand response into load-modifying (demand-side) and California ISO-integrated supply-side programs and incorporates two types of programs—critical peak pricing and peak-time rebates—designated as load-modifying. More programs may be assigned this designation in the future. Distributed generation resources, such as PV or CHP, are modeled as peak load reductions.

[3] MTEP15 at 111.

[4] Committed means "utility and public agency programs, codes and standards, and legislation and ordinances having final authorization, firm funding, and a design that can be readily translated into characteristics capable of being evaluated and used to estimate future impacts." *CED 2015 Revised* at 35.