

# Opportunity Knocks for Air Regulators

## FERC Order 1000

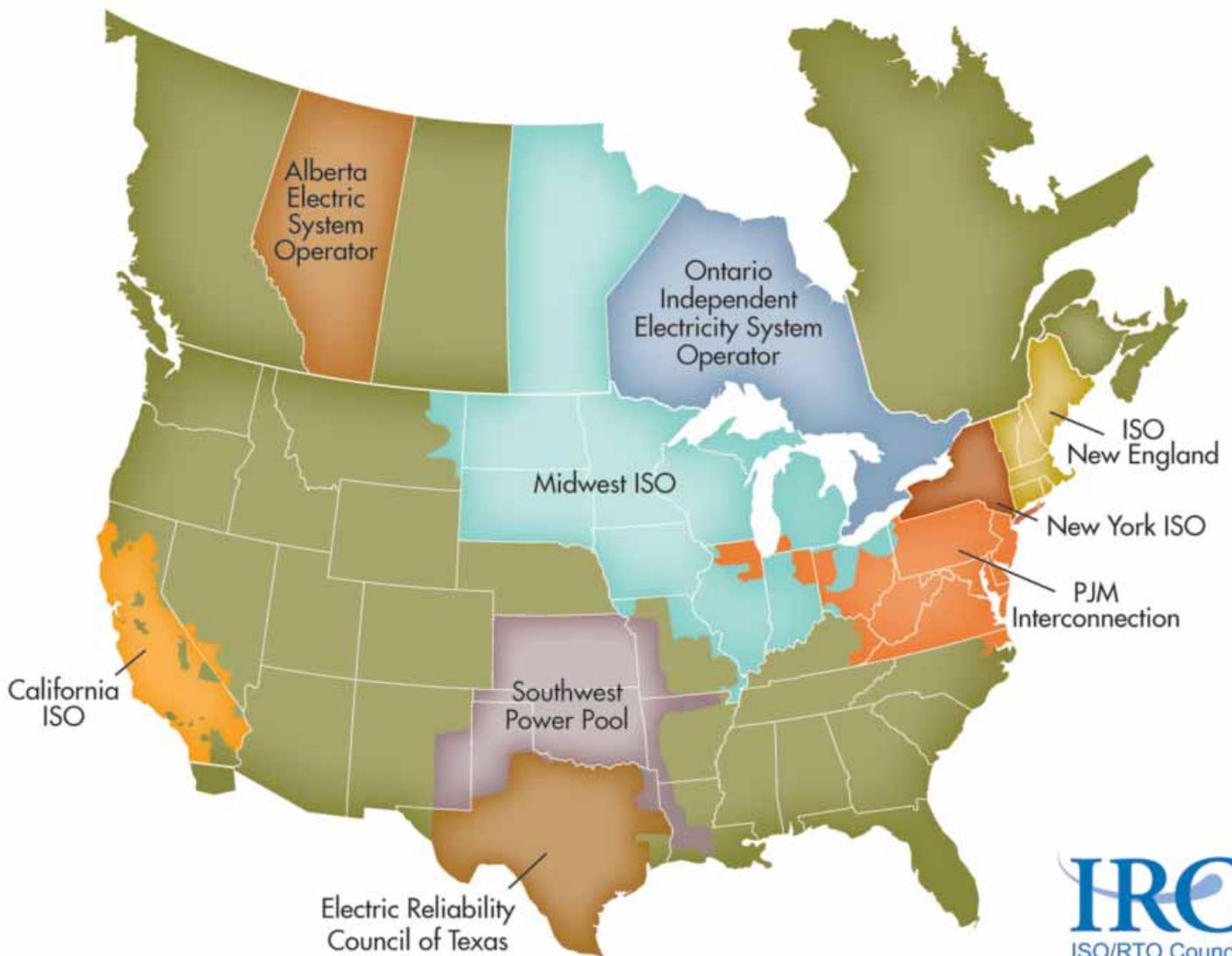
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The U.S. Federal Energy Regulatory Commission's (FERC) Order 1000, Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, issued on July 21, 2011, provides state, local, and tribal air quality officials with significant new opportunities to ensure that air pollution issues are considered in the course of electricity system planning.

In today's economy, the production and consumption of electrical energy is indisputably and inextricably linked with profound environmental and public health impacts. Power sector decisions, even those that appear on the surface to have minimal environmental consequences, can have serious short- and long-term impacts. Despite significant

improvements in air quality since the passage of the U.S. Clean Air Act more than 40 years ago, half of the U.S. population still lives in areas that exceed one or more of the National Ambient Air Quality Standards (NAAQS).<sup>1</sup> The energy sector is responsible for more than 80% of U.S. greenhouse gas emissions (CO<sub>2</sub>),<sup>2</sup> more than 70% of sulfur dioxide



emissions (SO<sub>2</sub>),<sup>3</sup> and approximately 20% of the oxides of nitrogen emissions (NO<sub>x</sub>).<sup>4</sup> Yet, energy and environmental regulatory agencies are structured in ways that largely ignore this intrinsic energy-environment linkage. However, a recent landmark decision by the U.S. Federal Energy Regulatory Commission (FERC) creates an important opportunity to integrate energy and environmental goals.

Air quality officials, in particular, have significant new opportunities to ensure that air pollution issues are considered in the course of electricity system planning as a result of FERC Order 1000, *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*.<sup>5</sup> This article outlines the importance of FERC Order 1000 to state, local, and tribal air regulators<sup>6,7</sup> and suggests ways that they can engage productively to take advantage of the new opportunities. Although FERC Order 1000's title gives the impression of being narrowly targeted and constrained, its effects are wide-ranging and far-reaching.

## Background

Electric system reliability—"keeping the lights on"—is the overarching concern of utility regulators. Reliability includes two primary components: an adequate supply of electricity (i.e., generation) and the ability to deliver it with minimal interruption in service (i.e., transmission and distribution).<sup>8</sup> Electricity generation and its local transmission and distribution lie nominally within the regulatory domain of state public utility commissions, whereas FERC's responsibility is to regulate interstate transmission of electricity in the bulk power system. So if each state's electricity grid were independent of and unconnected with others, FERC would have little say in their operation.

In pursuit of greater reliability, however, most states have partnered to create regional electricity grids or

"reliability areas" (see Figure 1). By and large, these regional efforts have improved reliability, but numerous concerns have arisen. The governance of regional planning organizations has been dominated by incumbent utility interests and has operated with relatively little transparency or opportunity for meaningful input from consumer and environmental advocates or the general public. Although state agencies and non-profit organizations have participated in some regional transmission planning processes, their inclusion has been inconsistent and they have not been granted the voting rights afforded to transmission-owning entities. It is therefore unsurprising that regional planning processes have been prone to advance the narrow interests of the status quo.

Further, because reliability is a function of supply adequacy and the ability to deliver it, for practical purposes, these "transmission planning processes" have actually become "system planning processes" incorporating both generation and transmission planning. In this context, it is perhaps understandable why (a) some high-emitting power plants have been favored as "reliability-must-run" units (even dispatched outside of economic merit order); (b) consideration of cleaner new units has often been relegated to the end of expensive interconnection queues; and (c) traditional supply options (i.e., construction of expensive new power plants and transmission lines) have typically trumped "non-transmission alternatives" (NTAs) like energy efficiency measures, demand response programs, or customer-sited distributed generation when new resources are deemed necessary for reliability.

With regional transmission planning processes often tilted toward ever-increasing energy infrastructure development, cost, intensity of air emissions, water consumption, and land use impacts, FERC felt the need to step in. It did so with Order 1000.

### « Figure 1. FERC RTO map.

*Notes:* FERC has encouraged utilities to join regional transmission planning organizations (RTOs) because, among other things, emergency resources and capabilities can be shared rather than replicated in each state. To take advantage of these benefits and to ensure that adequate grid reliability planning is done and contingency measures are in place, broad reliability regions have been established. All transmission providers (except those in Hawaii and Alaska), whether organized in a regional transmission planning organization (except ERCOT) or not, must comply with the order and submit a compliance plan to FERC.

*Source:* ISO RTO Operating Regions; ISO/RTO Council; [www.isorto.org/site/c.jhKQIZPBImE/b.2604471/](http://www.isorto.org/site/c.jhKQIZPBImE/b.2604471/) (accessed July 2013).

## Key Elements of FERC Order 1000

FERC Order 1000 establishes three key requirements for transmission planning:

- 1 Transmission providers must participate in regional planning processes that are open and permit input from all stakeholders;
- 2 Regional transmission planning processes must consider transmission needs driven by public policy requirements established by state or federal laws or regulations (e.g., renewable portfolio standards (RPS), energy efficiency resource standards (EERS), State Implementation Plan (SIP) requirements, etc.); and
- 3 Transmission providers must consider non-transmission alternatives (e.g., energy efficiency, demand response, distributed generation, etc.) that can efficiently and cost-effectively satisfy reliability needs, as well as conventional energy supply and transmission projects.

FERC Order 1000 is particularly seminal from an air quality perspective. Given the significant emissions impacts of the electric power sector, the requirement that non-transmission alternatives receive consideration comparable to traditional supply options may enable air quality regulators to propose and secure outcomes that could help avoid nonattainment designation or meet State Implementation Plan (SIP) obligations under the U.S. Clean Air Act.

FERC's intent in Order 1000 is to provide for cost-effective, reliable electricity service, either through new or upgraded transmission lines or through non-transmission alternatives that avoid the expense and impacts of constructing additional supply or transmission capacity when it may not be needed. Input from air quality and other environmental regulators is essential for transmission planners to incorporate environmental concerns into their regional transmission plans.

The remainder of this article describes how state air quality and energy regulators can take advantage of FERC Order 1000's provisions to (a) reduce the cost of meeting reliability requirements; (b) capture the effectiveness of non-transmission resources; and (c) help states meet air quality standards.

## Requirements Offer Opportunities

FERC Order 1000 creates a new venue for air regulators to raise concerns about the impact that energy resource decisions will have on a state's ability to meet NAAQS and other environmental obligations. For example, if a transmission plan recommends new generating resources, there are costs and emissions associated with this decision. Air emissions and water consumption of new generating facilities can differ markedly depending on fuel choice, boiler design, cooling technology, and so on.

In addition, environmental regulators must ensure that new resources do not impair the state's ability to meet NAAQS, water quality standards, and other environmental obligations. New generation proposed as an alternative to transmission is likely to be sited in denser load areas; such areas often already have unhealthy air quality or risk violating NAAQS if air quality is further degraded by increased pollution from new power plants. Alternatively, while new or upgraded transmission lines can help connect renewable resources and could reduce overall emissions, they can also shift generation from one area to another, making it possible for air emissions to increase in some areas.

No stakeholder is better-positioned to assess the environmental impact of the alternatives being considered than the state air regulators tasked with ensuring compliance with NAAQS. Each of FERC Order 1000's three key requirements provides a concrete opportunity for air quality officials to contribute to transmission planning processes.

### 1 Transmission Providers Must Participate in Regional Planning Processes that are Open and Permit Input from All Stakeholders

All transmission organizations undertake periodic planning exercises to assess what resources<sup>9</sup> may be needed to satisfy current and future electric system reliability requirements. Historically, these have been state-specific efforts, although some states in regions with closely linked transmission systems have previously engaged in regional, multi-state planning efforts. FERC Order 1000 directs all transmission providers to either initiate or

participate in regional planning processes to assess how reliability can be ensured on a broader interstate basis. In fact, the processes contemplated by FERC Order 1000 are analogous to the regional air quality planning processes initiated by the 1990 U.S. Clean Air Act Amendments to address transported ozone pollution and regional haze/visibility issues. State air regulators have long used these regional planning processes to analyze and share technical information, compare assumptions and approaches, determine emission reductions necessary to meet air quality requirements, and adopt joint policies to achieve the necessary reductions. With FERC Order 1000, state air officials have new opportunities to bring their concerns and experience to bear in regional transmission planning processes.

**2 Regional Transmission Planning Processes Must Consider Transmission Needs Driven by Public Policy Requirements Established by State or Federal Laws or Regulations**

Many states have adopted or are considering renewable portfolio standards (RPS) to encourage development of renewable energy generation. These resources typically require less water and emit less air pollution than fossil-fired generation.<sup>10</sup> Similarly, several states have adopted energy efficiency resource standards (EERS) or other energy efficiency obligations that also have beneficial economic, air quality, water, and land use impacts. Further, traditional state or federal requirements for cleaner air or water<sup>11</sup> have been regarded as “externalities” in the narrow view of transmission planning processes. With FERC Order 1000, regional transmission planners are required to consider these issues in reaching resource decisions. By participating in transmission planning processes, air regulators can help guarantee that lower-emitting resources receive appropriate consideration in comparison to traditional generation or transmission options. To the extent that new transmission is necessary, air officials’ participation can also help ensure that any new transmission resources accommodate the movement of electricity

generated from renewable resources to load centers.

**3 Transmission Providers Must Consider Non-Transmission Alternatives that Can Efficiently and Cost-Effectively Satisfy Reliability Needs, as well as Conventional Transmission Projects**

FERC Order 1000 recognizes the need to maintain electric system reliability, but adequate reliability can be achieved by many different means. Historically, reliability concerns spurred the construction of new supply-side resources; new generating facilities were built or transmission lines added or upgraded, which can increase grid access and lead to more pollution from older plants. However, other less-polluting means also exist, notably demand-side resources like energy efficiency and demand response actions. Demand-side measures can be targeted to relieve congestion in a specific “load pocket”—an area of particularly high electricity consumption. Demand response and load management activities can also reduce peak loads—and the very high electricity prices and air pollutant emissions characteristic of peak load periods—as well as alleviate the need to build or upgrade transmission lines. In addition, the application of combined heat and power (CHP) can utilize waste heat in flue gases to generate electricity at certain industrial facilities with high process heating or cooling loads, which can also help reduce transmission constraints and emissions.

Such non-transmission alternatives can be far more cost-effective than traditional supply-side options. Energy efficiency continues to be the least-cost, lowest-emitting, and least water-intensive resource across all regions of the United States. Further, many non-transmission alternatives (e.g., energy efficiency, demand response in the form of load curtailment, and distributed and renewable energy) can result in simultaneous, multi-pollutant air quality benefits. In the pursuit of cost-effective reliability solutions, FERC Order 1000 wisely requires transmission planners to give comparable consideration to demand-side, non-transmission alternatives as to traditional supply-side options like building new or upgrading existing generation and transmission resources.



By taking advantage of the opportunity FERC Order 1000 now offers, air regulators will find themselves in a better position to meet today's (and tomorrow's) challenges.

Air officials also need to be wary, however, that not all non-transmission alternatives represent lower-emitting options. In fact, some non-transmission alternatives can create or exacerbate air quality problems. Diesel backup generators—whether utility-owned or distributed, behind-the-meter “emergency” generators owned by industrial customers enrolled in load-shedding programs—generally have poor emissions controls, are typically located in or near load pockets, and are often dispatched on bad air quality days, making their emissions particularly damaging to ambient air quality. Air regulators’ participation in transmission planning processes can help guarantee appropriate consideration of these resources.

### Where Does FERC Order 1000 Stand Now?

FERC Order 1000 breaks new ground with respect to each of the three key requirements discussed above. By definition, that means no well-worn path for understanding or complying with FERC Order 1000 yet exists. For example, FERC has not articulated precise definitions for key terms such as: “plan,” “participate,” “planning process,” “evaluate,” “consider,” and “region.”<sup>12</sup> As a result, compliance with FERC Order 1000 will largely be determined on a trial-and-error basis as it is implemented, based largely on the input received from stakeholders. Hence, it is critical for environmental regulators to get involved now. The initial decisions being made today will establish precedents that will collectively become the standard of practice for involvement in future system planning decisions.

The schedule for FERC Order 1000’s implementation is aggressive. FERC required compliance filings from transmission providers for regional transmission planning activities by October 11, 2012, and for interregional transmission planning activities by July 10, 2013. The requirements of Order 1000 apply to any new transmission facilities evaluated after the effective date of these compliance filings. FERC recently issued its orders accepting compliance filings by PJM Interconnection, L.L.C.<sup>13</sup> and Midwest Independent Transmission System Operator, Inc. (MISO),<sup>14</sup> the regional transmission organizations serving the Mid-Atlantic and Midwest regions (see Figure 1). However, FERC directed both regional transmission organizations to propose

additional procedures to address transmission needs driven by public policy requirements—reinforcing this prime opportunity for state environmental agencies to participate.

### How Can Air Regulators Get Involved?

Under the auspices of FERC Order 1000, state environmental officials have an unprecedented opportunity to engage in transmission planning processes to ensure that state and federal public policies and non-transmission alternatives that have air quality and public health benefits get full and fair consideration.<sup>15</sup> FERC Order 1000 has opened new opportunities for participation, but the specific ways in which stakeholders’ input will be received and considered are now being engineered by transmission providers. By making their presence and interests known at this early stage, air regulators will have more chance to influence and facilitate pragmatic rules of engagement going forward.

There are several ways for air regulators to engage in regional transmission planning processes, depending upon each state’s regulatory or market structure:

- Environmental regulators are certainly “stakeholders” and as such may be able to participate directly in regional transmission planning processes. FERC chose not to establish any special deference to or inclusion of states concerning the review or approval of transmission planners’ response to public policy requirements. However, FERC strongly encouraged states to provide input and participate in transmission planning processes as stakeholders.
- In areas with organized electricity markets, the state public service commission (PSC) is probably already engaged in or is observing the applicable regional transmission planning process. Air regulators can leverage PSC engagement by working with PSC staff to raise and consider ways in which the transmission planning process can help to achieve air and water quality goals and to identify what intervention points may be most appropriate. Air officials may also find it useful to join with PSC staff in monitoring electricity demand forecasts, valuations of non-transmission alternatives, and other assumptions used in



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regional planning processes. In times of shrinking state funding, it may be daunting for air regulators to consider taking on the additional new opportunities offered by FERC Order 1000, but by working more closely together, air and energy regulators can make more efficient use of time, with less back-and-forth between them than often occurs today.

- In states that require utilities to prepare and submit integrated resource plans (IRPs), environmental regulators can discuss with the PSC ways in which air quality goals can be addressed simultaneously. They can also urge that the development and approval of IRPs align properly with FERC Order 1000's requirements. For example, utility IRPs should include state public policy requirements like renewable portfolio standards and should evaluate both transmission and non-transmission alternatives as means to meet electricity reliability requirements.
- In states that do not require their utilities to prepare IRPs, environmental regulators can still meet with their PSC counterparts to discuss some

form of joint planning. Coordinating the achievement of power system and environmental goals should enable reliability and air quality standards to be met in a more cost-effective and mutually reinforcing manner.

- During the transmission planning process, air regulators can strive to ensure that the costs associated with air pollutant emissions, which have historically been dismissed as "externalities", are considered when the cost-effectiveness of various transmission and non-transmission alternatives is evaluated.
- Participation in regional planning processes by environmental regulators can help elevate awareness of key risks (e.g., periodic revisions to ambient air quality standards) and opportunities (e.g., the potential multi-pollutant reduction benefits of certain measures) and ensure that they are properly considered in planning scenarios.

## Conclusion

Decisions resulting from regional transmission planning processes to assure future electricity system





- 2 The state's energy efficiency and renewable energy policies are properly considered as non-transmission alternatives; and
- 3 Measures identified to meet system reliability requirements assist rather than frustrate their state's efforts to improve environmental quality and public health.

reliability can have significant air quality impacts. FERC Order 1000 provides air regulators with substantial new opportunities to affect these outcomes. By participating in regional transmission planning processes—independently or in conjunction with their state PSCs—environmental regulators can help ensure that:

- 1 Regional transmission planning processes complement their state's efforts to protect public health through attainment of NAAQS;

Although it has always been possible for state and regional energy and environmental officials to collaborate closely, in reality it is not common. FERC Order 1000 reinforces and expands the opportunity and need for constructive interagency collaboration. Many challenges loom that have joint energy and environmental impacts, including changing electricity demand characteristics, new more intelligent and interactive efficiency and grid technologies, the potential for increasing electrification of the transportation sector, and the effects of climate change. By taking advantage of the opportunity FERC Order 1000 now offers, air regulators will find themselves in a better position to meet today's—and tomorrow's—challenges. **em**

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6. For brevity, the term "state" is used throughout this article as shorthand to represent state, local, and tribal entities.
7. While this article focuses on air quality issues, many of the opportunities created by FERC Order 1000 apply equally to issues of concern in other environmental media (e.g., water, waste, land use).
8. Definition of "Adequate Level of Reliability"; North American Electricity Reliability Corporation. See [www.nerc.com/docs/pc/Definition-of-ALR-approved-at-Dec-07-OC-PC-mtgs.pdf](http://www.nerc.com/docs/pc/Definition-of-ALR-approved-at-Dec-07-OC-PC-mtgs.pdf) (accessed July 2013). The North American Electric Reliability Corporation's (NERC) traditional definition of "reliability" consists of two fundamental concepts: adequacy and operating reliability. Adequacy is the ability of the electric system to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components. Operating reliability is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components.
9. The term "resources" here refers to both supply-side resources, such as fossil-fired or renewable electric generation, and demand-side resources, such as energy efficiency or demand response measures. FERC Order 1000's requirement to consider non-transmission alternatives means demand-side and "behind-the-meter" resources, such as combined heat and power (CHP) installations at industrial sites, must be considered in regional transmission planning processes.
10. Although new and retrofitted fossil-fueled generating stations emit less pollution than older facilities, they do produce emissions and require water for cooling. Energy efficiency and renewable energy resources have no emissions and limited water requirements.
11. Examples include U.S. Clean Air Act requirements for Prevention of Significant Deterioration (PSD), ozone and fine particulate nonattainment of NAAQS and corresponding State Implementation Plan (SIP) emission reduction requirements, toxic air contaminant emissions reduction requirements, Total Maximum Daily Load (TMDL) limits in water discharges, and thermal discharge limits.
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14. 142 FERC 61,215. Order on Compliance Filings and Tariff Revisions (Midwest Independent Transmission System Operator, Inc.; MISO). See [www.ferc.gov/whats-new/comm-meet/2013/032113/E-2.pdf](http://www.ferc.gov/whats-new/comm-meet/2013/032113/E-2.pdf) (March 2013).
15. FERC Order 1000 applies directly to transmission providers in all states except Texas, Alaska, and Hawaii. FERC's jurisdiction applies to the interstate transmission of electricity, so transmission providers in states with vertically integrated utilities, as well as states with organized electricity markets, must comply with the order.

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