UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Transmission Planning Processes Under Order No. 890	))	Docket No. AD09-8-000

REPLY COMMENT OF THE FEDERAL TRADE COMMISSION
December 3, 2009

The Federal Trade Commission (FTC) appreciates this opportunity to submit a reply comment regarding the transmission planning and transmission cost allocation issues raised in the Notice of Request for Comments (Notice) that the Federal Energy Regulatory Commission (FERC) issued on October 8, 2009.

FERC is considering means to strengthen regional transmission planning processes by broadening the geographic scope of transmission planning. FERC asks: "Are transmission planning processes adequate to identify and evaluate potential solutions to needs affecting the system of multiple transmission providers?" Transmission planning is most likely to be effective when the geographic scope of the planning process matches the geographic scope of the power flows that affect transmission operations. For the United States, the relevant transmission areas are the Eastern, Western, and Texas Interconnections.[1] When transmission planning occurs on this geographic scale, it can more efficiently incorporate all of the relevant congestion, reliability, and environmental considerations. Our comment contrasts with the viewpoint expressed in the comment of Dayton Power and Light (Section II.D.) to the effect that consistency in transmission planning with Interconnections is of little importance because ad hoc solutions historically have been the norm.[2]

A planned, efficient expansion is necessary to make the nation's transmission system robust. FERC finds, however, that inadequacies and inconsistencies in cost allocation techniques appear to be undermining or slowing efficient transmission investments, particularly when a transmission project spans several transmission operating areas. Such wide-area projects can reduce the costs of complying with new renewable resource requirements and potential climate legislation or regulation. FERC asks: "Should processes be established to help stakeholders address cost allocation matters over larger geographic regions?" FERC should develop or facilitate consistent Interconnection-wide approaches to the allocation of transmission costs as a way to support efficient transmission investment activity. Setting a single, standard cost

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[1] The Electric Reliability Council of Texas (ERCOT) is the Texas Interconnection.

[2] *See* Comments of The Dayton Power and Light Company, *available at* http://elibrary.ferc.gov:0/idmws/File_list.asp?document_id=13768002.

allocation approach within each Interconnection is likely to benefit consumers by reducing transaction costs, regulatory risks, and project delays associated with the existing processes.

FERC also asks: "How can customers that benefit from a particular facility be determined?" FERC's strategy for assessing benefits should be mindful that the transmission system's functions are evolving. In particular, when customers are on dynamic pricing and generators are intermittent, the benefits of transmission projects differ from those benefits in the traditional world (in which customers are passive and generators' output is more predictable). Computerized grid simulation techniques may be useful in assessing the specific benefits of individual transmission projects – or of portfolios of such projects – under a variety of plausible scenarios about future grid conditions. Accurate methods to combine the evaluations of transmission's economic and reliability benefits would lead to more accurate estimates of those benefits. Our comment contrasts with the comment of Dayton Power and Light,[3] which advocates a form of "beneficiary-pays" approach that does not appear to include some important benefits of a robust transmission system for power consumers, environmental benefits, or the benefits of network economies that are likely to emerge as smart grid technology is deployed.

Interest of the FTC

The FTC is an independent agency of the United States Government responsible for maintaining competition and safeguarding the interests of consumers, both through enforcement of the antitrust and consumer protection laws and through competition policy research and advocacy. The FTC often analyzes regulatory or legislative proposals that may affect competition or allocative efficiency in the electric power industry. The FTC also reviews proposed mergers that involve electric and natural gas utility companies, as well as other parts of the energy industry. In the course of this work, as well as in antitrust and consumer protection research, investigation, and litigation, the FTC applies established legal and economic principles and recent developments in economic theory and empirical analysis.

The energy sector, including electric power, has been an important focus of the FTC's antitrust enforcement and competition advocacy.[4] The FTC's competition advocacy program has

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[3] *Supra* note 2.

[4] *See, e.g.* Opening Remarks at the FTC Conference on *Energy Markets in the 21st Century: Competition Policy in Perspective* (Apr. 10, 2007), *available at* http://www.ftc.gov/speeches/majoras/070410energyconferenceremarks.pdf. FTC merger cases involving electric power markets have included the *DTE Energy/MCN Energy* (2001) (consent order), *available at* http://wwwftc.gov/os/2001/05/dtemcndo.pdf; and *PacifiCorp/Peabody Holding* (1998) (consent agreement), *available at* http://www.ftc.gov/os/1998/02/9710091.agr.htm. (The FTC subsequently withdrew the *PacifiCorp* settlement when the seller accepted an alternative acquisition offer that did not pose a threat to competition.)

produced two staff reports on electric power industry restructuring issues at the wholesale and retail levels.[5] FTC and FERC staff (along with others) were members of the Electric Energy Market Competition Task Force, which issued a *Report to Congress* in 2007.[6] In addition, the FTC has held public conferences on energy topics, including *Energy Markets in the 21st Century* (April 10-12, 2007)[7] and *Carbon Offsets & Renewable Energy Certificates* (January 8, 2008).[8]

The FTC and its staff have filed numerous competition advocacy comments with FERC and participated in FERC technical conferences on market power issues. For example, in March 2007, the Deputy Director for Antitrust in the FTC's Bureau of Economics served as a panelist for a technical conference on FERC's merger and acquisition review standards under Federal Power Act (FPA) Section 203 (Docket No. AD07-2-000). The FTC submitted comments in July 2004 and January 2006 in FERC's proceeding on its FPA Section 205 standards for market-based rates (Docket No. RM04-7-000). The FTC also has commented on FERC's initiatives to promote wholesale electricity competition and on various state issues associated with restructuring the electric power industry.[9]

Background

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[5] FTC Staff Report, *Competition and Consumer Protection Perspectives on Electric Power Regulatory Reform: Focus on Retail Competition* (Sept. 2001), *available at* http://www.ftc.gov/reports/elec/electricityreport.pdf; FTC Staff Report, *Competition and Consumer Protection Perspective on Electric Power Regulatory Reform* (July 2000), *available at* http://www.ftc.gov/be/v000009.htm (compiling previous comments from the FTC staff provided to various state and federal agencies).

[6] *See* http://www.ferc.gov/legal/fed-sta/ene-pol-act/epact-fina-rpt.pdf.

[7] Conference materials *available at* http://www.ftc.gov/bcp/workshops/energymarkets/index.shtml.

[8] Conference materials *available at* http://www.ftc.gov/bcp/workshops/carbonoffsets/index.shtml. Other programs have included the FTC's public workshop on *Market Power and Consumer Protection Issues Involved with Encouraging Competition in the U.S. Electric Industry*, held on Sept. 13-14, 1999 (workshop materials available at http://www/ftc.gov/bcp/elecworks/index.shtm); and the Department of Justice and FTC workshop on *Electricity Policy*, held on April 23, 1996.

[9] *See*, *e.g.*, Federal Trade Commission, Comment before the Federal Energy Regulatory Commission on Wholesale Competition in Regions with Organized Electric Markets (Apr. 17, 2008), *available at* http://www.ftc.gov/be/v070014b.pdf. A listing of FTC and FTC staff competition advocacy comments to federal and state electricity regulatory agencies (in reverse chronological order) is available at http://www.ftc.gov/opp/advocacy_date.shtm.

The Notice reflects FERC's concern that the transmission grid was not configured or developed to perform functions that it currently performs or is likely to perform soon.[10] Most of the existing transmission system was built to move power from central generating stations to major cities within self-sufficient, vertically-integrated monopoly utilities. Transmission ties between utilities generally were designed for relatively small, short-term flows of power to supplement a utility's own generation or to assist neighboring utilities facing minor generation shortfalls.

Over the past 15 years, however, FERC policies and legislation promoting wholesale competition among generators have changed the power sector dramatically.[11] Lower-cost generators, as well as generators that use renewable sources of energy, have increased output and served more distant customers, and thus have increased transmission substantially.[12] Consequently, the demand for transmission has increased, as has the volume of power transmitted.

Nevertheless, transmission investment has lagged, resulting in significant congestion in some areas. This congestion limits competition and increases power costs and prices, to the detriment of consumers. Incentives to reduce transmission congestion may be muted for some transmission owners. For example, a firm that owns both transmission and generation in the same region may profit when congestion prevents outsiders from competing with the firm's generation. This diminished competition also can harm consumers. Notwithstanding FERC transmission policies that have sought to blunt these anti-consumer incentives – and despite recent increases in transmission investment – consumers likely would benefit from further transmission investment.

Looking toward the future, several states have required that an increasing proportion of electricity be generated from renewable sources. Many of the best sites for wind and solar generation, however, are in remote areas that are not well connected to the existing transmission

[10] Notice. The issues associated with lagging investment and the legacy aspects of the transmission grid are discussed in more detail in the Electric Energy Market Competition Task Force's *Report to Congress on Competition in Wholesale and Retail Markets for Electric Energy*, *supra* note 6, at 36-37 (and, in general, in Chs. I-III).

[11] *See*, *e.g*., Harry Singh, "Transmission Markets, Congestion Management, and Investment," in Fereidoon Sioshansi (ed.), *Competitive Electricity Markets: Design, Implementation, Performance*, Ch. 4 (2008).

Some states have also allowed competition among retail firms seeking to serve end-users, especially large commercial and industrial customers.

[12] *See*, *e.g*., Erin T. Mansur and Matthew W. White, "Market Organization and Efficiency in Electricity Markets" (June 30, 2009), *available at* http://www.som.yale.edu/faculty/etm7/papers/mansur_white_pjmaep.pdf.

grid. Improvements in regional transmission planning, together with the resolution of disputes over how to allocate the costs of enhanced transmission investments, are likely to make it less expensive to comply both with existing renewable energy requirements and with potential future federal environmental policies. Absent these improvements in transmission planning and cost allocations, consumers may face higher electricity prices, lower-quality electricity services, and unnecessary, adverse environmental impacts.

Issues Addressed in FERC's Request for Comments

Below we discuss – and make recommendations concerning – the two major elements of FERC's Notice. Implementation of our recommendations likely would benefit consumers.

Enhancement of Regional Transmission Planning Processes

FERC's Notice observed that localized transmission planning institutions may be inadequate to handle larger-scale transmission projects, particularly those designed to connect renewable energy resources to high-demand regions. There is often insufficient coordination among local transmission planning organizations and between such organizations and regulatory authorities. In addition, both local and regional transmission planning bodies have sometimes given inadequate, inconsistent, or slow consideration to connection requests from renewable or independent generation entrants. The Notice asks for views about the appropriate geographic scope of transmission planning and seeks potential solutions to FERC's transmission planning concerns.

Transmission planning is most likely to be effective when the geographic scope of the planning process matches the geographic scope of power flows. When transmission planning occurs on this geographic scale, it can better incorporate the relevant congestion, reliability, and environmental considerations. For the United States, the Eastern, Western, and Texas Interconnections are the areas that best correspond to the relevant power flows.[13] Electricity

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[13] An Interconnection is an integrated, alternating current transmission systems within which all generators are synchronized. Power can be imported into or exported from one Interconnection to another only by first converting it to direct current and then converting it back to alternative current synchronized to the generators in the receiving Interconnection. Although the three separate Interconnections in the United States are well recognized, they are not immutable.

As recently as the early 1970s, direct alternating current ties between the Eastern and Western Interconnections were in operation. "Los Alamos Resource Pool Power Supply Study," DOE Contract No. DE-AC04-93AL82990 (July 1, 1994). The possibility of synchronizing ERCOT with the Eastern Interconnection was reexamined at the direction of the Texas Legislature as a possible way to help reduce concerns about retail market power and reliability problems. "Feasibility Investigation for AC Interconnection between ERCOT and SPP/SERC," Report to the 76th Texas Legislature (1998). The 1997 merger of Public Service Company of Colorado and Southwestern Public Service Company involved a reexamination of bringing the Eastern and Western Interconnections into synchrony. Submission of Lundberg, Marshall &

flows along the path (or paths) of least resistance within each Interconnection. This means that demand and supply conditions in one location can change power flows and the capacity to trade power elsewhere in that Interconnection.[14] Unusual local power flows can create transmission difficulties in other areas of an Interconnection and, in severe cases, can even give rise to cascading blackouts.[15] Investment decisions about transmission in one area can affect the need (and have other implications) for transmission investment elsewhere in the Interconnection. The efficient development and operation of transmission require a careful evaluation of these Interconnection-wide operational interactions and investment implications. Consequently, FERC should consider requiring ongoing transmission planning at the Interconnection level in order to facilitate the most effective and efficient transmission planning regime for the nation.[16]

The Interconnection-wide transmission planning process should be integrated with other planning efforts, so that the overall effort can give consistent treatment to demand-side and supply-side approaches to balancing the quantity of power supplied and consumed minute-by-

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Associates on behalf of the Department of Energy, Albuquerque Operations Office (July 30, 1997).

The low transmission volumes and high costs of additional ties envisioned at the time of these reviews combined to discourage synchronization between the three Interconnections. As climate legislation (or regulation) and retail competition unfold – with corresponding increases in potential power trades – and as improved transmission technologies emerge, FERC may wish to assess the costs and benefits of reconnecting the existing Interconnections. Direct current links between the Interconnections are another possibility, as proposed in the Tres Amigas project. *See* Heather Clark, Associated Press, "NM Project Would Link Nation's 3 Electric Grids" (Oct. 13, 2009), *available at* http://www.google.com/hostednews/ap/article/ALeqM5giMkwo6cFPWD1X-zXg4cgE7v_lIAD9BAGI080.

[14] FERC's Regional Transmission Notice of Public Rulemaking, Docket No. RM99-2-000, 64 Fed. Reg. 31398 (June 10, 1999), stated this explicitly and succinctly: "[T]he physical reality is that, within the three interconnection grids, any action taken by one transmission provider can have major and instantaneous effects on the transmission facilities of all other transmission providers."

[15] For example, on August 14, 2003, poor management of transmission failures in Ohio led to a cascading failure that spread through the Eastern Interconnection to black out places as distant as New York and Toronto. *See*, *e.g.*, U.S. Dep't of Energy, Pacific Northwest National Laboratory, "Looking Back at the August 2003 Blackout," *available at* http://eioc.pnl.gov/research/2003blackout.stm.

[16] Existing regional and local transmission planning organizations could be retained and integrated into Interconnection-wide transmission planning, using principles and standards that are consistent and complementary.

minute to achieve the greatest efficiency.[17] As FERC has observed, cooperation and coordination with state regulators can facilitate and expedite efficient decision-making that considers options, including local and regional approaches on both the demand and supply sides.[18] FERC – and the FTC, in prior comments[19] – have observed that a lack of demand response to changes in wholesale prices harms consumers by raising the electric system's costs, reducing its reliability, and impeding innovation. The increased use of dynamic retail pricing will sometimes be more cost-effective than transmission or generation investments as a way to ensure that a region can meet its peak demand and manage equipment failures. In other cases, transmission investments that connect intermittent wind and solar generators to more customers on dynamic pricing will let customers save by shifting their consumption to inexpensive windy or sunny periods, while increasing the intermittent generators' profits. Such a scenario might justify a connection that would not make sense under the traditional assumption that only generators – but not retail customers – will respond to demand and supply fluctuations.

Both transmission investment that increases competition among generators and improved retail pricing that increases demand elasticity can curb generator market power. Moreover, increased competition in the electric power industry has reduced pollution in most areas by increasing production efficiency and shifting production to newer generation sources, which generally have lower emissions.[20]

Allocating the Cost of Transmission and Assessing Transmission Benefits

As FERC describes in the Notice, allocating the cost of transmission has been one of the most contentious and time-consuming issues associated with the expansion of transmission

[17] The FTC's September 13, 2007, comment to FERC on Wholesale Competition in Regions with Organized Electric Markets (FERC Docket Nos. RM07-19-000 and AD07-7-000) described the benefits of improving retail pricing and of taking other steps to empower consumers to participate in reducing the social costs of the electricity system.

[18] An example of such cooperation and coordination is FERC's collaboration with the National Association of Regulatory Utility Commissioners in the areas of competitive procurement, demand-side management, and smart grid technology.

[19] *See*, *e.g.*, Reply Comment of the Federal Trade Commission before the Public Utility Commission, Commonwealth of Pennsylvania, Energy Efficiency and Conservation Program and EDC Plans (Dec. 17, 2008), *available at* http://www.ftc.gov/os/2008/12/V090001papuc.pdf; Comment of the Federal Trade Commission before the Federal Energy Regulatory Commission, Wholesale Competition in Regions with Organized Electric Markets (Apr. 17, 2008), *available at* http://www.ftc.gov/be/v070014b.pdf.

[20] Karen Palmer and Dallas Burtraw, "The Environmental Impacts of Electricity Restructuring: Looking Back and Looking Forward," 1:1 *Environ. & Energy Law & Pol'y J.* 171 (2006). An earlier version of this paper is available at http://www.rff.org/Documents/RFF-DP-05-07.pdf.

facilities.[21] Major threshold questions for transmission investors are how, and from whom, the costs of a project will be recovered. Established economic analysis demonstrates that it is fundamentally difficult to devise economically efficient market-like mechanisms to solve resource allocation problems that, like electricity transmission projects, have shared costs and benefits for many actors.[22]

Nonetheless, some approaches to these problems are less flawed than others. Investors, of course, want to see a return on their transmission investment in order to proceed. Existing cost recovery regulations rely on complex determinations of beneficiaries and often restrict cost recovery to limited geographic areas. Projects that cross more than one discrete local transmission planning or operating area can face severe challenges in gaining consistent and efficient agreements from multiple transmission planning, siting, and cost recovery regulators. FERC reports in the Notice that cost allocation disagreements appear to be undermining several major transmission expansion projects designed to improve transmission links to areas with renewable energy resources. The Notice asks for views on how to coordinate cost allocation

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[21] As discussed in FERC Order No. 890, various approaches have been used to allocate transmission costs. Some cost allocation regimes prescribe different treatments for individual transmission projects that are designated as reliability projects (as distinguished from projects that address transmission congestion). In October 2008, FERC approved a cost allocation method in the Southwest Power Pool (a regional transmission organization) that uses a portfolio approach to evaluate transmission projects and allocate transmission costs over broad geographic areas. Statement of then-Chairman Joseph T. Kelliher, FERC (Oct. 16, 2008), *available at* http://www.ferc.gov/news/statements-speeches/kelliher/2008/10-16-08-kelliher-E-8.pdf. Literature on transmission cost allocation methods includes a variety of suggestions. *See*, *e.g.*, Jeff Makholm, "Electricity Transmission Cost Allocation: A Throwback to an Earlier Era in Gas Transmission," 20:10 Electricity J. 13 (Dec. 2007); William Hogan, Juan Rosellon, and Ingo Vogelsang, "Toward a Combined Merchant-Regulatory Mechanism for Electricity Transmission Expansion" (Apr. 14, 2007), *available at* http://ksghome.harvard.edu/~whogan/Hogan_Rosellon_Vogelsang_IAEEFlorence_041407.pdf; Antonio Conejo, Javier Contreses, Delberis Lima, and Antonio Padilha-Feltrin, "Z_{bus} Transmission Network Cost Allocation," 22:1 IEEE Transaction on Power Systems 342 (Feb. 2007); Paul L. Joskow, MIT, "Patterns of Transmission Investment" (Mar. 15, 2005), *available at* http://econ-www.mit.edu/files/1174.

[22] The analyses that consider it difficult to engage in efficient, market-like decision-making about whether to build projects typically assume that each individual firm has secret information about how the project would affect its bottom line and about what investment and operating decisions it would make in the absence of the project. In *Game Theory*, Ch. 7 (1991), Drew Fudenberg and Jean Tirole provide an overview of relevant economic theory.

The availability of rich data about electricity flows and prices may make more information available than the literature assumes concerning the value of transmission to firms. Nevertheless, transmission planners are unlikely to know how firms would have invested, bid, and operated in the absence of the transmission project.

approaches. The Notice also seeks to identify the current and future beneficiaries of transmission investments – a critical consideration in allocating transmission costs.

Because building transmission that spans several transmission operating areas may significantly reduce the costs of complying with renewable portfolio standards or potential climate policies,[23] FERC should foster consistent, Interconnection-wide cost allocation approaches. The use of the same, reasonable cost allocation approach throughout each Interconnection-wide transmission planning area is likely to benefit consumers by reducing the transaction costs, regulatory risk, and project delays that the existing processes often create.

FERC's approach to transmission benefit assessment should recognize that the transmission system's functions are evolving. The historic function – to bring power from large, centralized generating stations to local retail distribution systems – remains important. The transmission system will increasingly connect customers with inflexible demand and generators with intermittent or inflexible output to flexible elements of the system. The flexible customers and power sources may be centralized, or they may be dispersed at the local distribution level. For example, air conditioners might be temporarily turned off, and plug-in hybrid electric vehicle batteries in Chicago might be dispatched to keep the lights on in Des Moines when the wind stops blowing in South Dakota. If these current trends continue, the operations of the transmission and local distribution systems are likely to become more closely related.[24]

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[23] "The organizational and regulatory framework that presently governs much of the U.S. electric power sector is not conducive to supporting these transmission investments. If remote sources of renewable energy are not available to meet state or potential future federal renewable energy portfolio standards or to respond to the incentives provided by CO_2 emissions prices, CO_2 mitigation goals will be even more costly to achieve." Paul L. Joskow, "Challenges for Creating a Comprehensive National Electricity Policy," at 5, European University Institute, Robert Schuman Centre for Advanced Studies, EUI Working Paper RSCAS 2009/01 (2009), *available at* http://cadmus.eui.eu/dspace/bitstream/1814/10618/1/EUI_RSCAS_2009_01.pdf.

[24] Two major developments – the rise of small-scale, flexible load and the increasing role of inflexible supply – are involved in increasing the role of demand-side resources in keeping supply and demand balanced on an Interconnection-wide scale. First, technological advances in metering have made it technically feasible and economical to measure consumption and provide price information to consumers over smaller intervals of time. Historically, a single retail electricity price often applied over months or years, despite the substantial changes that can occur in wholesale prices every few minutes due to changes in consumption and shifts in the mix of supply sources required to match it. Increasing the flexibility and price sensitivity of demand should allow increased reliance on lower-marginal-cost, high-capital-cost "base load" generation technologies that typically produce a consistent amount of power around the clock.

Second, requirements for renewable generation have increased because of environmental concerns. Many renewable generators are intermittent because they produce only when there is enough wind or sun. The conventional, expensive response to this problem has been to have thermal plants standing by to increase their output should wind or solar generation drop off.

Advances in smart grid technology (in addition to smart meters) likely will support and expand these trends.[25] (These trends also strengthen the above-described case for the integration of local and regional transmission and resource planning.)

Similarly, in a system with extensive distributed resources, such resources in one area may be used to supply other areas if strong transmission ties link the areas. In such a system, substantial network economies may be present and should be accounted for in an assessment of the beneficiaries of transmission investment. In general, network economies arise when the connection of additional customers to the network increases the social value of the network to its members. In this example, network economies arise because each additional customer with demand resources is a potential supplier for other customers whose supply activities may reduce power costs and prices, improve reliability, and reduce environmental harm.

Another, non-traditional role for transmission links is to curb the cost of integrating wind farms with intermittent output. For example:

- Transmission can reduce the cost of integrating wind generation by linking wind farms to a larger set of customers on dynamic pricing (or other demand response) programs that can partially synchronize their demand with wind speeds.

- Transmission investments can reduce the cost of managing intermittent wind generation by linking wind farms to a broader set of flexible generators and to other wind farms that may be experiencing uncorrelated changes in output.

FERC should develop a sound, coherent, and comprehensive methodology to estimate benefits, including reduced costs and improved reliability.[26] This methodology should account

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Demand response gives consumption the flexibility to offset some of the increased volatility from intermittent generators. Power from local distribution networks may play an increasing role in the Interconnection’s operation as demand response, renewable distributed generation, and energy storage technology (such as batteries on plug-in hybrid cars) become more important in providing both energy and ancillary services. Some of the effects of this compensation strategy will occur at the local distribution level (traditionally regulated by states) as well as at the transmission level (traditionally regulated by FERC).

[25] Smart grid technologies include, among others, advanced meters with two-way communication capabilities, appliances that automatically respond to price signals, monitors that report the condition of transmission lines more quickly and completely, and equipment designed to prevent short circuits on transmission lines. The American Recovery and Reinvestment Act of 2009 funded Department of Energy grants for the smart grid and renewable generation.

[26] The inclusion of environmental effects in this analysis would require valuation of the net environmental impacts of transmission projects (unless emissions taxes or cap-and-trade systems already price them).

for the way in which smart grid technology and intermittent generation will alter investments' costs and benefits. Experience to date suggests that the benefits of a particular transmission investment can be sensitive to many variables and can fluctuate widely over time (as evidenced by, *e.g.*, the volatility of natural gas prices, policies to encourage wind generation, and locational marginal prices).[27] The process of ascertaining who will benefit from a specific transmission investment is complex, and the accuracy of any such determination may well be ephemeral and sensitive to modeling assumptions. Accordingly, we encourage FERC to refine its use of data and analysis so as to yield reasonable choices, while also acknowledging that the future holds unavoidable uncertainties. The inappropriate use of computer simulations can lead decision-makers to follow apparently precise answers that are true only under opaque, strong modeling assumptions, even though those findings are misleading in many other scenarios.[28]

Computer simulation modeling of the transmission system can help in an assessment of transmission projects' implications for prices, reliability, and pollution. Such models, which can use a variety of scenarios to determine the range and robustness of the estimates,[29] are employed widely to examine the likely power flow and market power effects of generation investments.

FERC may wish to ascertain whether an allocation approach that assigns transmission costs locally is still warranted, given that a localized allocation approach may not enhance system-wide efficiency, reliability, and environmental goals.[30]

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[27] As discussed above, with respect to the sensitivity analysis of transmission benefits and beneficiaries, one should bear in mind that transmission and generation projects (including demand resources) sometimes can substitute for each other.

[28] *See*, *e.g.*, John H. Miller, "Active Nonlinear Tests (ANTs) of Complex Simulation Models," 44 Mgmt. Science 820 (June 1998).

[29] For a discussion of power system computer modeling regarding the market power effects of mergers, *see* the FTC Bureau of Economics' comment to FERC on "18 CFR Part 33, Revised Filing Requirements," FERC Docket No. RM98-4-000 (Sept. 11, 1998), *available at* http://www.ftc.gov/be/v980022.shtm.

[30] A recent federal appellate decision suggests that FERC may be required to make detailed assessments of beneficiaries to justify decisions to allocate transmission costs broadly. *Illinois Commerce Comm'n v. Fed. Energy Reg. Comm'n*, 576 F.3d 470 (7th Cir. 2009).