## DEPARTMENT OF ENERGY

### Office of Electricity Delivery and Energy Reliability; Draft National Interest Electric Transmission Corridor Designations

[Docket No. 2007–OE–01, Draft Mid–Atlantic Area National Corridor; Docket No. 2007–OE–02, Draft Southwest Area National Corridor]

**AGENCY:** Department of Energy.

**ACTION:** Notice and opportunity for written and oral comment.

**SUMMARY:** Having issued the first National Electric Transmission Congestion Study under section 216 of the Federal Power Act (FPA), and having evaluated public comments on the Study, the Department of Energy (Department or DOE) today begins two proceedings that may lead to one or more orders designating one or more national interest electric transmission corridors (National Corridors). The Department believes that, although the FPA does not require it, allowing an opportunity for comment on draft National Corridor designations prior to the Department issuing its FPA section 216(a) report will aid both the public and the Department. Interested persons may file written comments in one or both of these proceedings in the manner indicated in the **ADDRESSES** portion of this notice. Only those persons who file such comments by the date listed in the **DATES** portion of this notice will become parties to the proceedings and, thus, eligible to file a request for rehearing under FPA section 313 of any final order issued in these proceedings.

**DATES:** Written comments on the draft National Corridors must be received on or before July 6, 2007.

The Department has scheduled public meetings on Docket No. 2007–OE–01 (the draft Mid-Atlantic Area National Corridor) for the following dates:

May 15, 2007, 10 a.m. to 3:30 p.m., Arlington, VA; and

May 23, 2007, 10 a.m. to 3:30 p.m., New York, NY.

The Department has scheduled a public meeting on Docket No. 2007–OE–02 (the draft Southwest Area National Corridor) for May 17, 2007, 10 a.m. to 3:30 p.m., San Diego, CA.

**ADDRESSES:** Color versions of the figures included in today's notice as well as other supporting documents are available at *http://nietc.anl.gov.*

You may submit written comments on one or both of the draft National Corridors electronically at *http://nietc.anl.gov*, or by mail to the Office of Electricity Delivery and Energy Reliability, OE–20, U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585. If you are commenting on Docket No. 2007–OE–01 (the draft Mid-Atlantic Area National Corridor), your comments must be marked ''Attn: Docket No. 2007–OE–01.'' If you are commenting on Docket No. 2007–OE–02 (the draft Southwest Area National Corridor), your comments must be marked ''Attn: Docket No. 2007–OE–02.'' The following electronic file formats are acceptable: Microsoft Word (.doc), Microsoft Works (.wps), Corel Word Perfect (.wpd), Adobe Acrobat (.pdf), Rich Text Format (.rtf), plain text (.txt), Microsoft Excel (.xls), and Microsoft PowerPoint (.ppt). If you submit information that you believe to be exempt by law from public disclosure, you may only submit your comments by mail, and you must submit one complete copy, as well as one copy from which the information claimed to be exempt by law from public disclosure has been deleted. DOE is responsible for the final determination concerning disclosure or nondisclosure of the information and for treating it in accordance with the DOE's Freedom of Information regulations (10 CFR 1004.11).

**Note:** Delivery of U.S. Postal Service mail to DOE continues to be delayed by several weeks due to security screening. DOE therefore encourages commenters to submit comments electronically by e-mail. If comments are submitted by mail, the Department requests that they be accompanied by a CD or diskette containing the electronic files of the submission.

The locations for the public meetings are:

Arlington—Doubletree Hotel Crystal City—National Airport, 300 Army Navy Drive, Arlington, VA 22202–2891;

New York—Park Central New York Hotel, 870 Seventh Avenue at 56th Street, New York, NY 10019–4038; and

San Diego—Manchester Grand Hyatt San Diego Hotel, One Market Place, San Diego, CA 92101.

If you are interested in speaking at one of these meetings, please sign up at *http://www.energetics.com/NIETCpublicmeetings* or call 410–953–6250.

**FOR FURTHER INFORMATION CONTACT:** For technical information, David Meyer, DOE Office of Electricity Delivery and Energy Reliability, (202) 586–1411. *david.meyer@hq.doe.gov.* For legal information, Mary Morton, DOE Office of the General Counsel, (202) 586–1221, *mary.morton@hq.doe.gov.*

**SUPPLEMENTARY INFORMATION:**

## I. Background

*A. Statutory Framework*

Section 1221(a) of the Energy Policy Act of 2005 (Pub. L. 109–58) (EPAct) added a new section 216 to the Federal Power Act (16 U.S.C. 824p) (FPA). New FPA section 216(a) requires the Secretary of Energy (Secretary) [1] to conduct a nationwide study of electric transmission congestion [2] within one year from the date of enactment of EPAct and every three years thereafter. FPA section 216(a)(1) requires the Secretary to consult with ''affected States'' when conducting the study. 16 U.S.C. 824p(a)(1). FPA section 216(a)(2) provides ''interested parties'' with an opportunity to offer ''alternatives and recommendations.'' 16 U.S.C. 824p(a)(2). Following consideration of such alternatives and recommendations, the Secretary is required to issue a report on the study ''which may designate any geographic area experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers as a national interest electric transmission corridor.'' 16 U.S.C. 824p(a)(2). FPA section 216(a)(4) states that in determining whether to designate a corridor, the Secretary may consider whether:

(A) the economic vitality and development of the corridor, or the end markets served by the corridor, may be constrained by lack of adequate or reasonably priced electricity;

(B)(i) economic growth in the corridor, or the end markets served by the corridor, may be jeopardized by reliance on limited sources of energy; and (ii) a diversification of supply is warranted;

(C) the energy independence of the United States would be served by the designation;

(D) the designation would be in the interest of national energy policy; and

(E) the designation would enhance national defense and homeland security.

16 U.S.C. 824p(a)(4).

The effect of a National Corridor designation is to delineate geographic areas within which, under certain circumstances, the Federal Energy Regulatory Commission (FERC) may authorize ''the construction or modification of electric transmission facilities.'' FPA section 216(b); 16 U.S.C. 824p(b). The statute imposes several conditions on the exercise of FERC's

[1] This notice uses the terms ''Secretary'' and ''Department'' interchangeably.

[2] Electric transmission congestion (congestion) is the condition that occurs when transmission capacity is not sufficient to enable safe delivery of all scheduled or desired wholesale electricity transfers simultaneously. Congestion results from a transmission capacity constraint (constraint). *See* Section II.A of this notice for further discussion of these terms.

permitting authority within a National Corridor.

Under FPA section 216(b)(1), FERC jurisdiction is triggered only when either: the State does not have authority to site the project; the State lacks the authority to consider the interstate benefits of the project; the applicant does not qualify for a State permit because it does not serve end-use customers in the State; the State has withheld approval for more than one year; or the State has conditioned its approval in such a manner that the project will not significantly reduce congestion or is not economically feasible. 16 U.S.C. 824p(b)(1).[3] Further, FPA section 216(g) states, ''Nothing in this section precludes any person from constructing or modifying any transmission facility in accordance with State law.'' 16 U.S.C. 824p(g).

Under FPA section 216(b)(2)–(6), FERC may issue a permit only if all of the following conditions are met: the facilities will be used for the transmission of electric energy in interstate commerce; the project is consistent with the public interest; the project will significantly reduce congestion and protect or benefit consumers; the project is consistent with national energy policy and will enhance energy independence; and the project maximizes, to the extent reasonable and economical, the transmission capabilities of existing towers or structures. 16 U.S.C. 824p(b)(2)–(6).[4]

Accordingly, a National Corridor designation itself does not preempt State authority or any State actions. A National Corridor designation is not a determination that transmission must, or even should, be built; it is not a proposal to build a transmission facility and it does not direct anyone to make a proposal. Transmission expansion is but one possible solution to a congestion or constraint problem; increased demand response, improved energy efficiency, and conservation, as well as siting of additional generation close to load centers are also potential solutions. Whether a particular transmission project, some other transmission project, or a non-transmission project is an appropriate solution to a congestion or constraint problem identified by a National Corridor designation is a matter that market participants, applicable regional planning entities, and State authorities, among others, will consider and decide before any project is built. In the event that FERC jurisdiction under FPA section 216(b) is triggered, the designation of a National Corridor by the Secretary does not control FERC's substantive decision on the merits as to whether to grant or deny a permit application, specifically where any facilities covered by a permit should be located, or what conditions should be placed on a permit.

A National Corridor designation is not a siting decision; it does not dictate the route of any transmission project. If a transmission project is proposed in a National Corridor, it will be the State siting authorities, and potentially FERC if certain conditions are met, that will determine the specific route of that project.[5]

Thus, FPA section 216(a) does not shift to the Department any of the traditional roles of transmission planners and siting authorities in evaluating solutions to congestion and constraint problems and designing routes for transmission facilities. Instead, FPA section 216(a) assigns to the Department the role of identifying transmission congestion and constraint problems, and the geographic areas in which these problems exist.

*B. Congestion Study*

On August 8, 2006, DOE issued its initial congestion study (the Congestion Study) for comment by interested members of the public and affected States (71 FR 45,047 (Aug. 8, 2006)). The Congestion Study gathered historical congestion data obtained from existing studies prepared by the regional reliability councils, regional transmission organizations (RTOs) and independent system operators (ISOs),[6] and regional planning groups. The Congestion Study also modeled future congestion: the years 2008 and 2011 for the Eastern Interconnection; and the years 2008 and 2015 for the Western Interconnection. The modeling focused on five metrics: binding hours (the number of hours per year that a path is loaded to its limit and, thus, unable to accommodate all desired power transactions), U90 (the number of hours per year that a path is loaded above 90 percent of its limit), all-hours shadow price (the marginal cost of generation redispatch required to accommodate a given constraint averaged across all hours in the year), binding hours shadow price (average shadow price over only those hours during which the constraint is binding), and congestion rent (shadow price multiplied by flow, summed over all hours the constraint is binding).

Based on the historical data and the modeling results, the Congestion Study classified the most significant congestion areas in the country. Two ''Critical Congestion Areas'' (*i.e.* areas where the current and/or projected effects of congestion are especially broad and severe) were identified: the Atlantic coastal area from metropolitan New York through northern Virginia (the Mid-Atlantic Critical Congestion Area); and southern California (the Southern California Critical Congestion Area). Four ''Congestion Areas of Concern'' (*i.e.* areas where a large-scale congestion problem exists or may be emerging but more information and analysis appear to be needed to determine the magnitude of the problem) were identified: New England; the Phoenix-Tucson area; the San Francisco Bay area; and the Seattle-Portland area. Also, a number of ''Conditional Congestion Areas'' (*i.e.* areas where future congestion would result if large amounts of new generation were to be developed without simultaneous development of associated transmission capacity) were identified, such as: Montana-Wyoming; Dakotas-Minnesota; Kansas-Oklahoma; Illinois, Indiana and upper Appalachia; and the Southeast.

DOE has received over 400 comments on the Congestion Study. DOE has made all of these comments available at *http://nietc.anl.gov.* The Department is no longer accepting comments on the Congestion Study. All comments filed in response to today's notice should be limited to the draft National Corridors set forth in this notice.

[3] *See also* Regulations for Filing Applications for Permits to Site Interstate Electric Transmission Facilities, Order No. 689, 71 FR 69,440, 69,468 (Dec. 1, 2006), 117 FERC ¶ 61,202 at pp. 128–29 (2006) (to be codified at 18 CFR parts 50 and 380), *reh'g pending* (FERC Order No. 689) (§ 50.6(e) requires applicants to demonstrate that the conditions of FPA sec. 216(b)(1) are met).

[4] *See also id.* (§ 50.6(f) requires applicants to demonstrate that the conditions of FPA sec. 216(b)(2)–(6) are met).

[5] *See id.* 71 FR 69,440, 69,446, 117 FERC ¶ 61,202 at PP 41–42 (''The Commission will conduct an independent environmental analysis of the project and determine if there is no significant impact as required by [the National Environmental Policy Act]. It will look at alternatives, including, as appropriate, alternatives other than transmission lines. * * * It will review the alternatives for their respective impacts on the environment and will determine mitigation measures to lessen the adverse impacts. * * * The Commission will also consider the adverse effects the proposed facilities will have on land owners and local communities.''); and 71 FR 69,440, 69,470, 117 FERC ¶ 61,202 at p. 142–43 (§§ 380.5(b)(14) and 380.6(a)(5) require either an environmental assessment or an environmental impact statement for projects seeking permits under sec. 216(b)).

[6] RTOs and ISOs are Federally regulated entities charged with operating a regional transmission system in a manner that is non-discriminatory and ensures safety and reliability. The existing RTOs and ISOs do not own any transmission or generation and are run by independent boards of directors.

*C. Purpose of Today's Notice*

This notice summarizes and responds to the comments received in response to the Congestion Study that are relevant to the designation of National Corridors. This notice also issues and solicits comment on draft National Corridor designations for the two Critical Congestion Areas identified in the Congestion Study: the draft Mid-Atlantic Area National Corridor; and the draft Southwest Area National Corridor. See Figure I–1 for the location of these draft National Corridors.[7] Further, the Department has scheduled three public meetings to discuss these draft National Corridor designations. If, after consideration of all comments on these draft designations, the Secretary decides that one or more National Corridor designations are appropriate, he will issue one or more orders making such designations.

[7] A detailed explanation of the location of these draft National Corridors is provided in Sections VIII.D and IX.D of this notice.

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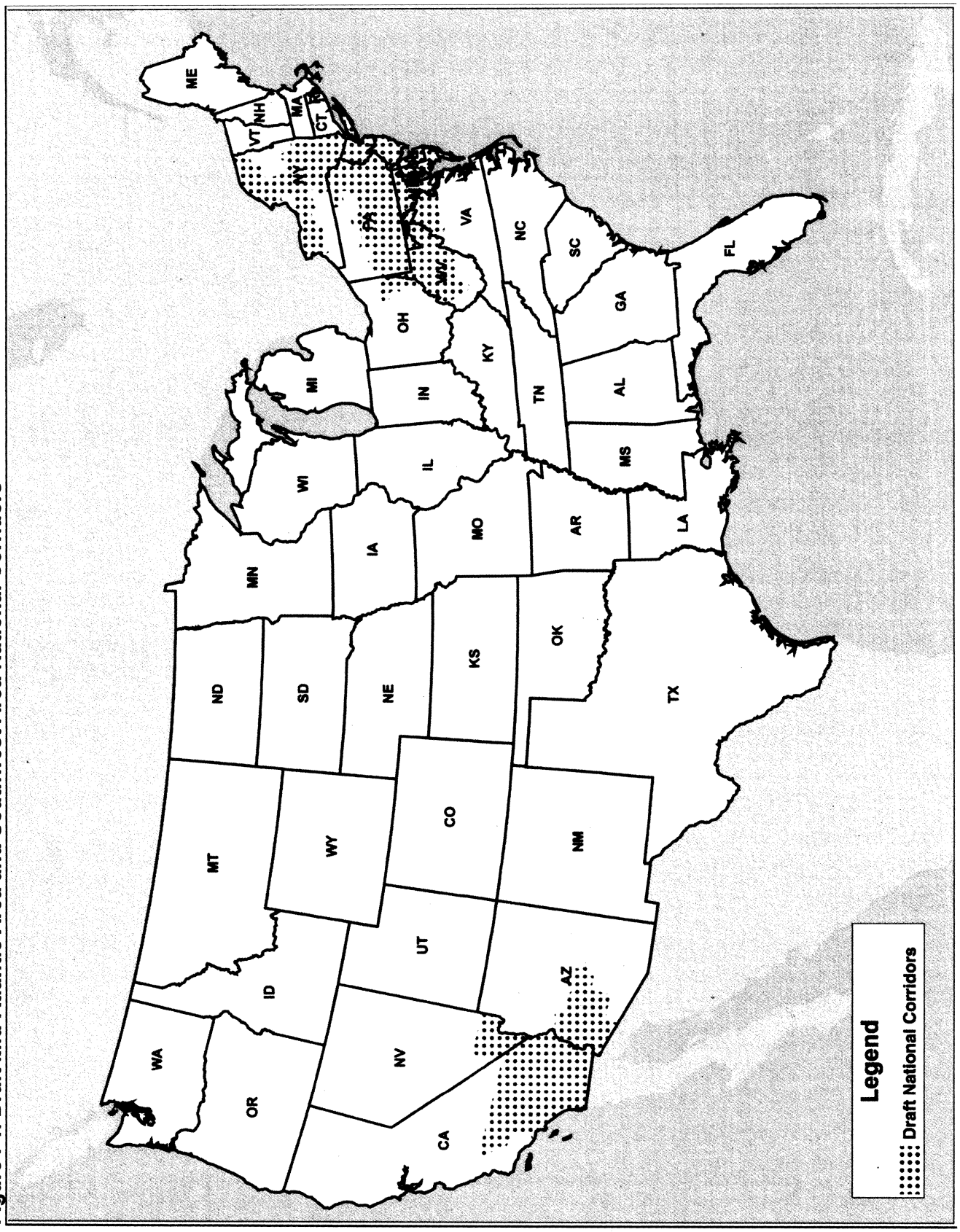


Figure I-1. Draft Mid-Atlantic Area and Southwest Area National Corridors

Source: U.S. Department of Energy, April 2007.

This notice is also intended to notify interested persons how to obtain party status for the proceeding in Docket No. 2007–OE–01 or the proceeding in Docket No. 2007–OE–02. Review of any final order designating a National Corridor in one of these proceedings will be governed by section 313 of the FPA (16 U.S.C. 8251). Thus, only those

persons who have obtained party status in the proceeding may file a request for rehearing of a final order with the Department. Further, to the extent that any person has standing to obtain judicial review, the filing of a rehearing request within 30 days of issuance of the final order is a prerequisite to such potential judicial review. In order to become a party to one or both of these proceedings, you must file comments in response to this notice in the manner indicated in the **ADDRESSES** portion of this notice by the deadline date identified in the **DATES** portion of this notice.

The proceedings being started today focus on the two geographic areas of the Nation experiencing the most acute and urgent electric transmission congestion problems. This notice takes no action with regard to the other geographic areas discussed in the Congestion Study. Thus, today's notice does not address comments received on the Congestion Study that relate solely to areas outside the two Critical Congestion Areas. Also, today's notice does not address those comments that relate to the conduct of future congestion studies. The Department will address the subject of how it intends to conduct future congestion studies in a later notice.

## II. Deciding When a National Corridor Designation Is Warranted

The Congestion Study solicited comment on the criteria the Secretary should use when determining when a National Corridor designation is warranted. In this section, the Department summarizes and responds to these comments.

### *A. General Scope of the Secretary's Authority*

Summary of Comments

The Department received numerous comments that relate to the general scope of the Secretary's authority to designate National Corridors, including comments on the meaning of key terms used in FPA section 216(a). The Department received a few comments on the appropriate definition of ''congestion'' and ''constraint.'' FirstEnergy Service Company (FirstEnergy) supported the definition of ''congestion'' used in the Congestion Study. National Grid USA (National Grid) argued that the Congestion Study's definition of ''constraint'' should be expanded to include not just limitations due to a piece of equipment, but also due to the absence of equipment between two or more nodes. Similarly, the California Energy Commission (CEC) argued that the focus of the Congestion Study is too narrow to accommodate State laws and policies on renewable portfolio standards. The CEC stated that the Department's criteria for identifying congestion should incorporate consideration of constraints that pose obstacles to reasonably priced power, diversity of supply, and energy independence, regardless of whether those constraints currently produce congestion.[8] Upper Great Plains Transmission Coalition argued that the lack of evidence of curtailments and congestion costs does not necessarily mean that a critical constraint is absent; for example, sophisticated management tools in place in the upper Great Plains have avoided the need for transmission loading relief (TLR) actions,[9] nevertheless, export capacity is constrained.

The Department received comments on the level of adverse effects on consumers needed to justify a National Corridor designation. The Pennsylvania Public Utility Commission (PAPUC) argued that National Corridors should be designated only where it is demonstrated that there is chronic physical congestion that has potential for substantially impairing existing or future grid reliability. The Attorney General for the State of Connecticut (Connecticut Attorney General) argued that the Department has no authority to designate a corridor in an area that the Congestion Study acknowledges does not rise to the level of a Critical Congestion Area. The Connecticut Attorney General argued that the statute was not intended to empower the Department to ''act as a sort of roving commission that oversees transmission planning and construction nationwide,'' and thus designations should be limited to ''those limited and extraordinary circumstances in which transmission constraints so severely impact the national interest that Federal intervention'' may be warranted.

On the other hand, LS Power Development, LLC (LS Power) argued that the statutory standard for designating a corridor ''appears to be relatively low'' and that this is understandable given the limited purpose of a National Corridor designation. LS Power further argued that the Department should apply the standard for designation liberally, instead of ranking different areas of congestion and only addressing some of those areas. LS Power asserted that if an area is congested, consumers are therefore adversely affected by higher costs, and consumers should be afforded the potential relief available through a National Corridor designation. Similarly, the Edison Electric Institute (EEI) argued that the Department should not wait until a major problem emerges before designating a National Corridor, given the long-term, capital-intensive nature of electricity infrastructure development. EEI urged the Department to maintain a high-level view and not dwell on the unachievable goal of technical precision in the congestion study process before making designations. The Electric Power Supply Association (EPSA) argued that National Corridor designation is warranted wherever the grid is constrained to the point of only being available to accommodate power flows of incumbent utilities to serve their native load, because in all such circumstances consumers are adversely affected by the existence of a barrier to entry of potentially lower-cost competitors.

The Department received comments on the use of projections of future congestion to support a National Corridor designation. The Organization of MISO States (OMS) argued that the statute makes clear that designations may only be made for areas actually experiencing congestion adversely affecting consumers, and does not provide for designations in areas that *may* experience congestion in the future or under certain circumstances. Therefore, OMS was not persuaded that National Corridor designation is warranted in the Congestion Areas of Concern or the Conditional Congestion Areas. OMS stated that rather than attempting to forecast the need for future National Corridors, designations should be in response to existing, persistent, and well-documented problems. Some Western commenters, including Northern Wasco County Peoples Utility District (NWPUD) and Seattle City Light (SCL), argued there is a need to examine historical data and not rely solely on simulated congestion metrics. Public Service Electric and Gas Company, PSEG Power LLC, and PSEG Energy Resources and Trade LLC (collectively PSEG) argued that forecasts of future congestion, driven by long-range projections of fuel costs, are inherently questionable. ABB, on the other hand, said National Corridor designation should not be based solely on analysis of historic congestion but rather should be made after a comprehensive analysis of future resource mix and resource adequacy.

[8] *See also* comments of BP Alternative Energy North America Inc.

[9] TLR is a procedure used in the Eastern Interconnection, usually outside of organized markets, to deal with situations when a transmission path has reach its operating limit.

The American Wind Energy Association, Wind on the Wires, Interwest Energy Alliance, the Wind Coalition, and the Renewable Northwest Project (collectively Wind Associations) expressed concern that the Department may approach Conditional Congestion Areas in a manner that ''continues the 'chicken and egg' problem of wind development, in which no generators are constructed until transmission capacity is built, but no transmission capacity is expanded until there are generators requesting service.'' Thus, the Wind Associations sought clarification that National Corridors can be designated in a Conditional Congestion Area before all the expected generation has been developed in that area.

Some commenters called for clarification of the criteria the Department would use in deciding whether to designate a National Corridor and made recommendations about criteria they considered most important. For example, the Committee on Regional Electric Power Cooperation (CREPC) stated that the Department should develop metrics for the criteria used to designate National Corridors and document how it has applied the criteria. CREPC argued that priority should be given to designating National Corridors that enable the achievement of State energy policy objectives or that address location-constrained generation resource areas; low priority should be given to areas with contractual congestion but little physical congestion, or areas where findings of congestion are based on studies with a high level of uncertainty. The American Public Power Association (APPA) suggested that the Department focus on the effect that a designation will have on the plans of load-serving entities to meet their long-term service obligations to their retail customers; in particular, the effect on deliverability of new base-load and renewable resources to the load-serving entities that intend to purchase power from those resources. The Midwest Independent Transmission System Operator, Inc. (Midwest ISO) [10] supported the reduction in electricity supply costs as a criterion for National Corridor designation; however, only if there is sufficient evidence that such cost reductions would occur and that the amount of the reductions would be significant enough to warrant national attention.

[10] Midwest ISO is the RTO serving all or parts of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, and Wisconsin.

DOE Response

FPA section 216(a)(2) gives the Secretary the discretion to designate as a National Corridor ''any geographic area experiencing electric energy transmission capacity constraints or congestion that adversely affects consumers.'' The statute does not define any of the terms in this phrase.

The Congestion Study defined ''congestion'' as the condition that occurs when transmission capacity is not sufficient to enable safe delivery of all scheduled or desired wholesale electricity transfers simultaneously. This definition generated little debate among commenters.[11] The Congestion Study defined ''transmission constraint'' as a limitation on one or more transmission elements that may be reached during normal or contingency system operations. The Congestion Study also defined ''constrained facility'' as a transmission facility (line, transformer, breaker, etc.) that is approaching, at, or beyond a System Operating Limit or Interconnection Reliability Operating Limit.[12] ''Congestion,'' then, refers to the denial of desired transmission service over a transmission path, while ''constraint'' refers to the chokepoint on the transmission system that causes such denial of desired transmission service.

In contrast, there is no generally accepted understanding of what constitutes ''constraints or congestion that adversely affects consumers,'' as the debate among the commenters amply demonstrates. The term is ambiguous, and the statute attaches no modifiers to the term to specify the particular type or magnitude of adverse effect intended. While the Congestion Study identified and applied various metrics ''related to the magnitude and impact of congestion,'' the Congestion Study did not attempt to define when constraints or congestion ''adversely affects consumers.'' In the following discussion, the Department will first address congestion that adversely affects consumers and then constraints that adversely affect consumers.

With regard to congestion that adversely affects consumers, the Department notes that any congestion, by definition, thwarts customer choice, because it prevents users of the transmission grid from completing their preferred power transactions. These users include wholesale industrial consumers of power as well as load-serving entities buying power on behalf of retail consumers, all of whom are prevented by congestion from obtaining delivery of desired quantities of electricity from desired sources. In other words, any congestion on a line necessarily interferes with the choices of those who wish to use that line on their own or their customers' behalf. Whenever there is congestion on a transmission path, there simply is not enough transmission capacity to accommodate all the desired power transactions, and some sort of rationing of available capacity is needed. In areas with organized electricity markets, this rationing generally occurs through a pre-established economic mechanism, such as a congestion management system based on locational marginal prices (LMPs),[13] which is designed to allocate the limited capacity to the users who value it the most. In areas of the country without organized markets, the rationing may involve the transmission provider denying requests for transmission service, adjusting schedules, or in some cases making *pro rata* curtailments in real time. Regardless of how the rationing is resolved, however, one thing remains true: congestion results in some users of the transmission system being denied the benefit of their preferred transactions.

Moreover, electricity buyers generally seek power from the most economic source. Arranging for delivery of power from less preferred sources is referred to as ''redispatching'' power. When congestion occurs, resulting in the need

[11] Other sources use similar definitions. See, *e.g.*, California Independent System Operator, Conformed Simplified and Reorganized Tariff, App. A, Master Definitions Supplement (April 6, 2007) (''Congestion—A condition that occurs when there is insufficient Available Transfer Capacity to implement all Preferred Schedules simultaneously or, in real time, to serve all Generation and Demand.''); and Southwest Power Pool, Glossary and Acronyms, *http://www.spp.org/glossary.asp?letter=C* (''Congestion is a condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules for electricity transmission simultaneously.'').

[12] One aspect of the constraint-related definitions used in the Congestion Study did generate debate among commenters, which is addressed later in this section.

[13] In general terms, an LMP-based congestion management system entails an RTO or ISO operating a bid-based energy market in which those generators and loads who have not fully committed themselves through bilateral power contracts can participate. As the operator of the transmission system, the RTO or ISO also analyzes whether transmission of all the desired energy transactions is simultaneously feasible. When there are no binding constraints, the energy market clears at a single price throughout the system. When a constraint is binding, separate prices result on either side of the constraint. Market participants can then see and respond to these different LMPs. Those customers who choose to have power transmitted over the binding constraint are assessed a transactional congestion charge based on the difference between the LMPs on either side of the constraint.

for buyers to accept power from less-preferred generating sources in order to meet their power needs, redispatch is required and typically results in the use of more expensive power. Congestion also usually reduces competition and diversity, by limiting the range of generators from which buyers can obtain power. Finally, congestion means that parts of the transmission system are so heavily loaded that grid operators have fewer options for dealing with adverse circumstances or unanticipated events, thus increasing the risk of blackouts, forced interruptions of service, or other grid-related disruptions.

Therefore, any congestion can adversely affect at least some consumers. Nevertheless, congestion remedies are not free; therefore, not all congestion is worth fixing. Under certain circumstances, congestion can arise on any transmission path. But the appearance of isolated or transient instances of congestion usually does not warrant consideration of transmission expansion. While the Department is not attempting in this notice to define the complete scope of the term ''congestion that adversely affects consumers'' as used in FPA section 216(a)(2), the Department concludes that the term includes congestion that is persistent. Thus, the Department believes that FPA section 216(a) gives the Secretary the discretion to designate a National Corridor upon a showing of the existence of persistent congestion, without any additional demonstration of adverse effects on consumers. However, as discussed below, whether the Secretary should exercise his discretion to designate a National Corridor in a given instance of congestion is a separate question.

With regard to constraints that adversely affect consumers, one way in which a constraint can adversely affect consumers is by causing persistent congestion that in turn, as discussed above, adversely affects consumers. However, the Department agrees with those commenters who argue that the Secretary's authority is not limited to areas where congestion presently exists. If Congress had intended to limit the Secretary's designation authority over constraints to cases where constraints are currently causing congestion, then there would have been no need for the statutory language to refer to ''any geographic area experiencing electric energy transmission constraints *or* congestion that adversely affects consumers.'' *See* 16 U.S.C. 824p(a)(2) (emphasis added). Further, the Department agrees with those commenters who argued that the total absence of a line connecting two nodes can be just as, if not more, limiting to consumers than the presence of a line that is operating at capacity and, therefore, constraints include the absence of transmission equipment between two or more nodes.[14]

Constraints limit access to power sources. Further, the existence of a constraint can hinder the development of new power sources, since project sponsors may not be able to obtain the financing they need if there is uncertainty over the degree to which their electricity could be delivered to consumers. Again, the Department is not attempting in this notice to define the complete scope of the term ''constraints that adversely affect consumers'' as used in FPA section 216(a)(2). However, the Department concludes that the term includes not only constraints that cause persistent congestion, but also constraints that hinder the development or delivery of a generation source that is in the public interest. Thus, the Department believes that FPA section 216(a) gives the Secretary the discretion to designate a National Corridor upon a showing of the existence of a constraint, including the total absence of a transmission line, that is hindering the development or delivery of one or more generation sources that is in the public interest, regardless of whether there is congestion and without the need for any additional demonstration of adverse effects on consumers.[15] This interpretation of the term ''constraints or congestion that adversely affects consumers,'' which allows for a National Corridor designation when there is a constraint that adversely affects consumers even though there is no present congestion, is appropriate because it gives meaning to all of the terms used in the statutory provision.

Additionally, this interpretation of the statute answers the concerns of those commenters who question whether the statute authorizes designation of National Corridors in the Conditional Areas of Concern based solely on projections of future congestion. The Congestion Study identified several Conditional Areas of Concern ''where future congestion would result if large amounts of new generation were to be developed without simultaneous development of associated transmission capacity.'' The Secretary is taking no action with respect to those areas at this time. Nevertheless, were the Secretary to designate a National Corridor for one of those areas, the Secretary would need only to demonstrate the existence of a constraint that was hindering the development or delivery of a generation source that is in the public interest, and would not need to rely on demonstrations of future, or even present, congestion.[16]

The Department's interpretation of the scope of the Secretary's authority is consistent with the objective and structure of the statute. FPA section 216(a), as well as other provisions of EPAct,[17] evince concern about the need to strengthen transmission infrastructure throughout the Nation. The Department concludes that a broad interpretation of the Secretary's discretion to designate National Corridors is consistent with that concern, particularly given the effect of a National Corridor designation, as discussed in Section I.A above. Given the statutory limitations on the exercise of FERC's permitting authority, there is no need to interpret narrowly the Secretary's National Corridor designation authority.

While the Department concludes that the Secretary has broad authority to designate National Corridors, FPA

[14] A node is the physical location on the transmission system where energy is, or will be, injected by generators or withdrawn by loads.

[15] As the Department is not issuing any draft National Corridors today based on the existence of constraints in the absence of persistent congestion, it is unnecessary in this notice to reach the question of the type of information that would be required to demonstrate that a constraint is hindering the development or delivery of a generation source that is in the public interest. However, the Department notes that the considerations identified in FPA section 216(a)(4) provide some examples of generation sources the development of which would be in the public interest, including sources that are needed to ensure adequate or reasonably priced electricity, sources that are needed for diversification of supply, sources that would promote energy independence, sources that would further national energy policy, or sources that would enhance national defense and homeland security. There may, however, be other generation sources the development of which would be in the public interest.

[16] Because the Department is not issuing any draft National Corridor designations based solely on projections of future congestion (without any showing of a constraint that adversely affects consumers), it is not necessary to determine now the extent of its authority to do so.

[17] *See, e.g.*, EPAct sec. 1241 (requiring FERC to establish rules to promote capital investment in transmission); EPAct sec. 1233 (requiring FERC to exercise its authority in a manner that facilitates planning and expansion of transmission to meet the needs of load-serving entities); EPAct sec. 368 (requiring the designation of energy right-of-way corridors across Federal lands for electric transmission and other energy projects); FPA sec. 216(h) (establishing procedures to ensure timely and efficient review of proposed transmission projects by Federal agencies); and EPAct sec. 1222 (giving additional authority for Western Area Power Administration and Southwestern Power Administration to participate with other entities in the development of transmission).

section 216(a) does not require the Secretary, under any circumstances, to make a National Corridor designation. Rather, in recognition of the Department's expertise, the statute leaves to the Secretary's judgment which geographic areas experiencing constraints or congestion adversely affecting consumers to designate as National Corridors. The Department recognizes that FPA section 216(a) adopted a novel approach to addressing the need for new transmission infrastructure, an approach that poses challenges to all stakeholders as we collectively work to address this problem. Therefore, the Secretary intends to proceed carefully in the exercise of his discretion to designate National Corridors. As evidenced by the specific draft designations set forth below, the Department is not starting the process of designating National Corridors at the outer limits of its authority. The Congestion Study identified two Critical Congestion Areas, and today's notice issues two draft National Corridors to address them. These draft National Corridors are based on the existence of well-known, persistent congestion that adversely affects large numbers of consumers.

Finally, the Department does not believe it is necessary to develop a specific and finite set of criteria to guide the exercise of the Secretary's discretion. Instead, the most reasonable interpretation of FPA section 216 is that the Secretary may make National Corridor designations based on the totality of the information developed, taking into account relevant considerations, including the considerations identified in FPA section 216(a)(4), as appropriate.

*B. Analysis of Potential Solutions*

Summary of Comments

The Department received comments on whether a National Corridor designation should be based on an analysis of potential solutions to an identified congestion problem. Many commenters, including the National Association of Regulatory Utility Commissioners (NARUC), the New York Public Service Commission (NYPSC), and the New Jersey Board of Public Utilities (NJBPU), argued that the Department should conduct a cost/benefit analysis of transmission solutions as well as non-transmission solutions to relieving congestion before designating a National Corridor; otherwise, they contend, the designation would unfairly skew the playing field in favor of transmission solutions.[18] For example, the NJBPU and PSEG argued that without such an analysis, National Corridor designation may lead to preemptive siting of long-haul rate-based transmission projects intended to move power from remote generating sources to load centers, and thus distort or destroy market signals for local developers of generation, demand response resources, and improvements to local distribution systems. NYPSC and the New York Independent System Operator (NYISO)[19] urged the Department to analyze the potential market impact of a National Corridor designation, because the very act of designating a National Corridor could cause downstream project developers to abandon already-planned facilities. Consolidated Edison Company of New York, Inc., and Orange and Rockland Utilities, Inc. (collectively ConEd) and NJBPU expressed concern about whether a National Corridor would disadvantage local generation to the detriment of reliability, noting that remote generation cannot provide the same level of voltage support and other ancillary services that local generation can. Numerous individuals who commented in opposition to specific transmission projects asserted that the Department has an obligation under FPA section 216 to consider alternatives to building new transmission lines.

On the other hand, numerous commenters argued that the Department should not engage in analysis of possible solutions to congestion. These commenters noted that the Department's role is to identify areas where congestion and constraints exist, whereas other entities, including State siting authorities, regional planning entities, market participants, and under some circumstances FERC will consider the relevant solutions. These commenters cautioned that any such analysis by the Department would unnecessarily delay the designation process.[20]

DOE Response

The Department disagrees with those commenters who argue that a National Corridor designation is warranted only if the Department has demonstrated that transmission is the best, or at least a cost-effective, solution to an identified congestion problem. Nothing in FPA section 216 requires or envisions that the Department make such a demonstration. In fact, the preparation of a transmission cost-benefit analysis by the Department would be inconsistent with the very role that the statute assigns to the Department. As discussed in Section I.A above, the Department's role under FPA section 216 is to identify constraint or congestion problems and their geographic locations; the statute does not call for the Department to analyze and decide upon solutions. While FPA section 216(a)(2) does call for the Secretary to consider ''alternatives and recommendations from interested parties'' before making a National Corridor designation, the reference to ''alternatives and recommendations from interested parties'' in this provision is ambiguous. In light of the statutory framework, the Department concludes that the term ''alternatives and recommendations from interested parties'' is intended to refer to comments suggesting National Corridor designations for different congestion or constraint problems, comments suggesting alternative boundaries for specific National Corridors, as well as comments suggesting that the Department refrain from designating a National Corridor.

The Department acknowledges that transmission expansion is but one possible solution to a congestion or constraint problem; increased demand response, improved energy efficiency, and conservation, as well as siting of additional generation close to load centers are also potential solutions. However, given the effect of a National Corridor designation and the existing obligations of State and Federal siting authorities as discussed in Section I.A above, there is no need for the Department to undertake an analysis of transmission solutions and non-transmission solutions or to speculate about any theoretical indirect effects a National Corridor designation would have on the market. Indeed, the Department believes that expanding its role to include making findings on the optimal remedy for congestion could supplant or otherwise duplicate the traditional roles of States and other entities.

*C. Cost Allocation*

Summary of Comments

The Congestion Study solicited comment on how the costs of proposed transmission should be allocated. A few commenters argued that the Department

[18] *See also* comments of EPSA, Northern Indiana Public Service Company, Old Dominion Electric Cooperative (ODEC), OMS, Piedmont Environmental Council (PEC), PSEG, The Wilderness Society (Wilderness), and many individuals.

[19] NYISO is the ISO serving New York State.

[20] *See, e.g.*, comments of FirstEnergy, National Grid, and National Rural Electric Cooperative Association (NRECA).

should consider cost allocation when deciding whether to make a National Corridor designation, and offered recommendations on specific cost allocation structures.[21] For example, Montana-Dakota Utilities Co. argued that the Department should only designate National Corridors where the resulting transmission facilities would be paid for on a beneficiary-pays, rather than a postage-stamp, basis. NRECA supported rolled-in rate treatment for projects that serve native load network customers. However, the majority of those who provided comment on cost allocation issues urged against the Department considering those issues in the FPA section 216(a) process.[22] These commenters noted that FERC, rather than the Department, has jurisdiction over cost allocation for transmission projects, and argued that cost allocation was not relevant to National Corridor designation.

DOE Response

The Department agrees with those commenters who argue that the analysis of whether to designate a National Corridor should not include consideration of how the costs for new transmission facilities will be allocated. While cost allocation issues can be critically important to determining whether, when, and where specific transmission projects are developed, those issues are not relevant to the Secretary's role under FPA section 216(a) of identifying geographic areas where congestion or constraints are adversely affecting consumers.

*D. Regional Planning and Local Siting*

Summary of Comments

The Department received comments on the relevance of regional planning processes to National Corridor designation. FirstEnergy argued that in general, in RTO regions, National Corridors should be designated when a transmission facility would relieve congestion in an identified congestion area and the facility has been recognized as needed for reliability in an RTO's transmission planning and expansion process. The Midwest ISO argued that the Department should wait to designate a National Corridor until a suitable planning solution is proposed within an identified congestion area. NARUC argued that the Department should grant deference to the results of adequate regional planning processes. Other commenters, for example NYPSC, also recommended that the Department should coordinate its designations with regional planning processes.

On the other hand, some commenters expressed concern about the Department relying too much on RTO input regarding designation of National Corridors. For example, ODEC argued that while RTOs provide a forum within which public and well-vetted transmission planning *could* occur, at this time they lack procedures needed to ensure that such planning would actually occur. ABB expressed concern about the fragmented nature of the studies performed by RTOs.

OMS argued that any designation must be based on the existence of siting barriers. For example, OMS asserted that if needed transmission is not being constructed due to cost recovery or other non-siting uncertainties, then a designation is inappropriate. According to OMS, designation is only appropriate when a National Corridor is truly necessary to solve a congestion problem of national significance, when the congestion problem is persistent, and when the prior failure to develop a solution is the result of siting problems. The Public Utilities Commission of the State of California (CPUC) argued that designation is unwarranted unless there is evidence that State and regional processes are not addressing the problem in a timely manner. CPUC argued that it is, first of all, up to the States and the regions to solve their transmission planning and siting problems, and Federal agencies should not intervene unless and until there is a demonstrated need for them to do so. CPUC further asserted that designation of a National Corridor in connection with any large multi-state project is likely to delay project siting, because of litigation and conflict it would produce. CEC commented that Federal back-stop siting would be beneficial where the State has been unable to make progress in approving vital transmission projects.

PAPUC argued that the Department should not make any designation that does not clearly identify the national interests requiring protection and without making findings of fact that those interests are better served by a National Corridor designation than by another approach that would be less intrusive of State laws and policies. NYISO urged the Department to designate National Corridors with care so as not to usurp arbitrarily State siting authority. On the other hand, the Midwest ISO argued that the Department should not wait until local siting has become problematic, given the effect of a National Corridor designation.

DOE Response

The Department disagrees with those commenters who suggest that the Department defer making a National Corridor designation either until siting problems have already manifested themselves or until a regional planning process proposes a solution to the congestion or constraint problem. Nothing in FPA section 216 requires or envisions that the Department adopt a wait-and-see approach to National Corridor designation. FPA section 216 empowers the Department to make designations when it finds constraints or congestion adversely affecting consumers, a finding that is not dependent on actions that others (*e.g.*, transmission owners, regional planners, or States) may take to remedy those constraints or congestion. The Department fully supports such entities taking aggressive action to remedy congestion and nothing in a National Corridor designation conflicts with their ability to do so. Moreover, acting in parallel with the efforts of other entities is consistent with Congressional intent in enacting EPAct, which emphasizes the immediate need for new investment in transmission. Delaying action by the Department until action by all others is exhausted would not be consistent with this intent, nor with the Nation's pressing need for new transmission.

Moreover, the statute provides a specific mechanism by which States can insulate themselves from the FERC permitting provisions of FPA section 216(b). FPA section 216(i)(1) provides that three or more contiguous States may enter into interstate compacts establishing regional transmission siting agencies. 16 U.S.C. 824p(i)(1). Such regional transmission siting agencies would then have authority to site transmission facilities in National Corridors. FPA section 216(i)(3); 16 U.S.C. 824p(i)(3). Further, FERC would have no authority to issue a transmission permit within a State that is party to such a compact unless the members of the compact were in disagreement and the Secretary, after notice and opportunity for hearing, made a finding that the conditions of FPA section 216(b)(1)(C) were met. FPA section 216(i)(4); 16 U.S.C. 824p(i)(4). In light of this mechanism, as well as the other statutory limitations on FERC's permitting authority discussed in Section I.A above, the Department concludes it would be inappropriate for it to limit itself to designating National Corridors where States have either

[21] *See* comments of PSEG, ODEC, and J. Hayden.

[22] *See, e.g.*, comments of Allegheny Power, American Electric Power (AEP), Arizona Public Service Company (APS), ConEd, Duke Energy Corporation (Duke), EEI, FirstEnergy, LS Power, National Commission on Energy Policy (NCEP), National Grid, and OMS.

failed to act or have already developed a preferred solution.

The Department supports and encourages regional planning efforts. A National Corridor designation neither dictates nor bars any solution that might be considered in a regional planning process. The Department intends to draw the boundaries of any National Corridor so as to encompass a range of potential transmission solutions. In the event that a regional planning process concludes that a modification to an existing National Corridor designation is needed, the Department will consider such a request.

**III. Defining National Corridor Boundaries**

*Summary of Comments*

In the Congestion Study, the Department solicited comment on how, where, and on what basis to establish the boundaries of a National Corridor. One approach identified in the Congestion Study would use specific transmission projects to define National Corridor boundaries. Under this approach, a proponent of a National Corridor would identify a specific project that could serve as a solution to the underlying congestion or constraint problem, an approximate centerline for the project would be identified, and the National Corridor boundary would be banded around that centerline. A number of commenters, including EEI, AEP, and Allegheny Power (Allegheny), supported this approach.

Some commenters supported a project-based approach provided that there was some sort of independent review of the project. For example, ODEC argued that an open stakeholder process should first identify and vet conceptual projects and then make National Corridor boundary recommendations to the Department for those projects. Southern California Edison Company (SCE) argued that National Corridor boundaries should be tailored to aid in the construction of specific viable transmission projects approved through a regional planning process. CREPC stated that the delineation of National Corridor boundaries should be informed by a detailed analysis of congestion mitigation options.

Several commenters raised the possibility of an incremental process for setting National Corridor boundaries, under which the Secretary would first make a designation of a broad area, and then as specific transmission proposals are developed and presented for review by appropriate authorities, the Secretary would narrow the boundaries.[23] Commenters who supported a project-based approach emphasized that National Corridor boundaries drawn in such manner should not dictate a particular line route, but rather should be drawn broadly enough to allow for consideration of alternative alignments during the siting process.

On the other hand, some commenters opposed the project-centerline approach to developing National Corridor boundaries. For example, PAPUC argued that such an approach would involve the Secretary in siting decisions of the sort that Congress did not intend and for which the Department lacks expertise. OMS opposed National Corridor designation for particular projects. A number of commenters supported use of a non-project-based approach either instead of or in addition to a project-based approach. FirstEnergy suggested that in the absence of a specific project, a National Corridor could be drawn by means of a radius around the congested area. However, most commenters who supported a non-project-based approach recommended that the Department use a source-and-sink approach to setting National Corridor boundaries, in which the Department would identify a sink (the congested or constrained load area) and a source (an area of potential supply), and then draw a National Corridor connecting these two areas.[24] AEP's version of a source-and-sink approach looks at three factors: the area of potential generation resources, the critically congested load area, and the transmission deficiencies between the two areas.

Several commenters supported the specification of precise boundaries for National Corridors. For example, Allegheny argued that specific boundaries are needed so that the project sponsor would know whether its project is encompassed within a National Corridor, FERC could readily determine the geographic scope of its potential jurisdiction, and land owners would know whether their property may be subject to the Federal exercise of eminent domain. However, OMS argued that instead of setting specific perimeter boundaries, the Department should identify source and sink areas, define the goal of the National Corridor, and then limit the National Corridor designation to those projects that further that goal. OMS expressed concern that delineation of specific boundaries could have the effect of establishing Federal transmission line corridors within States, and notes that just because a proposed project is located within a National Corridor it should not be assumed to address the concerns that lead to the designation of the National Corridor.

With regard to drawing the specific perimeters of a National Corridor, Allegheny argued for using existing or proposed originating, intermediate, and terminating substations for proposed lines identified by planning studies. Numerous commenters argued that the Secretary should draw National Corridor boundaries to exclude parks and other environmentally protected areas.[25] Some commenters, including CEC, Imperial Irrigation District (IID) and the Appalachian Trail Conservancy, recommended that the Department take into consideration existing rights of way when drawing boundaries. CEC argued that DOE should ensure that any National Corridors in California are delineated in a manner consistent with recent legislation concerning State designation of electric transmission corridors.[26] NCEP noted that congestion occurs within an electrical system of flowgates rather than within a specific geographic framework, and expresses concern that arbitrary geographic boundaries may foreclose the most cost-effective option for remedying congestion. Thus, NCEP argued that Balancing Authorities, which have the job of managing congestion, should be used to define National Corridor boundaries.

Several commenters emphasized the need to make the area covered by a National Corridor broad, to ensure adequate flexibility of transmission planners and siting authorities to consider alternatives.[27] The Appalachian Trail Conservancy argued that National Corridors should be 75 to 100 miles wide in order to allow flexibility to align projects to avoid environmentally sensitive areas. Northwestern Energy argued for broad National Corridors so that one group of developers is not put at an unfair advantage. ABB argued that the boundaries of a National Corridor should include adjacent contiguous areas physically affected by large

[23] *See, e.g.*, comments of APS, Wyoming Infrastructure Authority, and Great Northern Properties, L.P. and Great Northern Power Development, L.P.

[24] *See, e.g.*, comments of PAPUC, OMS, and National Grid.

[25] *See, e.g.*, comments of CEC, National Parks Conservation Association, National Park Service, Wilderness, Upper Delaware Council, and numerous individuals.

[26] *See* 2006 Cal. Adv. Legis. Serv. 638 (Deering) (to be codified at Cal. Pub. Res. Code §§ 25330–341).

[27] See, *e.g.*, comments of PG&E, ConEd, LS Power, National Grid, and Western Business Roundtable.

transmission upgrades since it is likely that additional reinforcements will be needed in those outlying areas. EEI argued in favor of a two-track process for drawing boundaries. Under EEI's process, where there is a specific transmission project that could address the congestion or constraint problem, the boundaries would be as narrow as several miles wide; where no specific projects have been proposed, the boundaries would be wider, up to 200 miles, to allow for a range of possible solutions.

On the other hand, some commenters acknowledged the need for flexibility to consider alternatives but cautioned against drawing the National Corridor boundaries too broadly. For example, the City of New York stated that an overbroad interpretation of ''corridor'' is both inconsistent with the plain meaning of the word and may be too amorphous to provide adequate guidance for beneficial transmission planning. The PAPUC argued that National Corridors should be set so as to minimize the intrusion into State siting jurisdiction and to guarantee that any transmission projects claiming the benefits of the National Corridor designation will actually address the problem Congress intended to address. PAPUC further argued that the Department should require a project claiming the benefits of the National Corridor designation to show that its project would substantially alleviate the specific directional congestion on which the National Corridor was based and that the project would not conflict with any other transmission solutions being planned in the applicable regional planning process. Long Island Power Authority (LIPA) argued that an overbroad National Corridor would dilute the effectiveness of FPA section 216 and would discourage non-transmission solutions.

*DOE Response*

The statute provides little direction on how the Department should draw the boundaries of a National Corridor. FPA section 216(a) uses the term ''geographic area'' and lists several considerations the Secretary may take into account when making a National Corridor designation. However, the statute does not define the term ''corridor.'' While this term is commonly understood to refer generally to some sort of path between different areas, the specific meaning of the term in this context is ambiguous. After careful consideration of the overall purpose and effect of this statutory provision, as well as the comments received, the Department has concluded that, while there may be circumstances where a project-based approach would be appropriate, in general the Department will use a source-and-sink approach to defining National Corridor boundaries.

As discussed in Section I.A above, the National Corridor designation process is intended as a process to identify congestion and constraint problems, and the geographic areas in which these problems exist, rather than as a process to identify solutions to those problems. Just as the determination of whether to designate a National Corridor need not await or rely on the existence or analysis of specific transmission proposals, neither does the determination of the boundaries of that National Corridor. Setting National Corridor boundaries through a source-and-sink approach is consistent with the problem-identification purpose of National Corridor designations under FPA section 216(a), because it is not focused on any particular transmission projects, or set of transmission projects.

The Department recognizes that when it designates a National Corridor, there may be specific projects that have already been proposed within the boundaries of that National Corridor. Such is the case with the draft National Corridors designations in this notice. This result is not surprising, because these draft National Corridors encompass well-known constraints that have adverse effects on millions of consumers. However, the Department emphasizes that it is neither endorsing nor recommending any specific projects when it designates a National Corridor based on a source-and-sink analysis.

There was broad consensus among the commenters that if a project-based approach were not used to set National Corridor boundaries, then a source-and-sink approach should be used. Such an approach is consistent with the common usage of ''corridor'' as an area linking two other areas. Such an approach also is consistent with the physical properties of the electrical grid, because a transmission line into a congested or constrained load area will not benefit that load unless the line connects with a source of power that could help to serve the load.

While the comments support the use of a source-and-sink approach to setting National Corridor boundaries, they provide little clarification about how such an approach should actually be implemented. The details of how the Department will draw the boundaries of a National Corridor will depend on the specific circumstances. However, in general terms, the geographic extent of the sink area in a National Corridor is determined by the geographic distribution of the consumers adversely affected by the congestion or constraints—in other words, the location of load downstream of the limiting transmission constraints.

With regard to the source area, where the decision to designate a National Corridor is based on the existence of a constraint that is hindering the development or delivery of a particular generation source that is in the public interest,[28] the identification of the appropriate source area would be relatively straightforward: the source area would be the geographic area within which that particular source of supply is, or is likely to be, located. In contrast, where the decision to designate a National Corridor is based on the existence of persistent congestion, the identification of an appropriate source area may require the consideration of a range of potential source areas. The selection of a source area or source areas in those situations will necessarily involve discretion and is not suited to a formulaic approach.

Given the long lead time involved in planning, obtaining regulatory approvals for, and constructing transmission projects, areas without a current surplus of generation could well develop additional power sources by the time a transmission project is completed. Therefore, depending on the circumstances, the Department may consider as potential source areas not only those areas with existing surplus generation, but also areas with projected surplus generation, or areas with available fuel supply for additional generation.

Once the Department has identified the range of potential source areas, it must then decide which of those potential source areas it will use to set the boundaries of a National Corridor. The Department observes that the considerations identified in FPA section 216(a)(4) provide guidance on some of the possible bases for making this decision. FPA section 216(a)(4)(A)–(E) authorizes the Secretary when making a National Corridor designation to consider lack of adequate or reasonably priced electricity, diversification of supply, energy independence, national energy policy, and national defense and homeland security. Each of these considerations potentially has relevance to the selection of source areas. For example, certain potential source areas may provide greater diversity of supply than others, or may be more consistent with national energy policy. Therefore, when there are multiple potential source areas, the Secretary will use his

[28] *See* Section II.A above.

expert judgment to determine which of the potential source areas to include, taking into account relevant considerations, including the considerations identified in FPA section 216(a)(4), as appropriate.

After the Department has identified the sink and source areas, it must then delineate the specific boundaries of a National Corridor linking those areas. The Department agrees with the majority of commenters that National Corridor designations should specify precise geographic boundaries. Such an approach is not only consistent with the plain meaning of the statutory term ''geographic area,'' it also provides greater clarity and ease of administration to those entities concerned with whether a particular project or land area would be encompassed within a National Corridor.

The Department acknowledges that determining the exact perimeters for a National Corridor under a source-and-sink approach is more an art than a science, and there will rarely be a dispositive reason to draw a boundary in one place as opposed to some number of miles to the left or right. The drawing of the boundary is ultimately a judgment the Secretary must make, based on all relevant considerations, including the considerations identified in FPA section 216(a)(4), as appropriate, and available, relevant data. There is no single boundary line that can be determined based solely upon analysis of the data. The Department notes that the drawing of the boundary lines of a National Corridor does not finally determine or fix the substantive rights of anyone. A National Corridor designation simply provides developers proposing certain projects within its boundaries an additional procedural option in the form of a potential Federal siting venue that is not available to transmission projects outside a National Corridor.

Therefore, the Department agrees with those commenters who emphasize the need for the Department to draw National Corridor boundaries so that they could encompass a range of potential projects and a range of potential routes.[29] So long as a range of alternatives is encompassed, further refinement is unnecessary. Given this approach, the Department concludes that it is not necessary to adjust the boundaries of a National Corridor to avoid parks or other environmentally protected areas or to align the boundaries with existing rights of way.[30] Further, the Department need not attempt to interpret State laws on siting preferences. The determination of the best route for a specific project will be made by siting authorities, who are better positioned to make such a determination. As discussed in Section I.A above, if a project in a National Corridor were to satisfy the statutory requirements for seeking a permit from FERC, FERC would analyze alternative routes for that project, including route realignments necessary to avoid adverse effects on the environment, landowners, and local communities. Nothing in FPA section 216 alters the applicability of Federal environmental and cultural statutes and regulations.

The Department recognizes that some States are concerned that specification of broad boundaries could result in unintended expansion of Federal siting authority to include proposed transmission projects that happen to be located within a National Corridor but are unrelated to the problem that prompted the National Corridor designation. Sometimes the approach described above could produce very large corridors; sometimes it could produce smaller corridors. The breadth of a corridor would be driven by the geographic expanse of the adversely affected load, the number and geographic dimensions of source areas, and the distance between the source and sink areas. FPA section 216(b) itself specifies the scope of FERC jurisdiction over projects proposed to be built in National Corridors, including a requirement that the project will ''significantly reduce transmission congestion and protects or benefits consumers.'' [31] The Department believes that these statutory limitations adequately address the States' concerns and do not require further clarification by the Department.

Finally, in the event that an affected party concludes at some later stage that a modification to the boundaries of an existing National Corridor is needed, the Department will consider such a request.

## IV. Involvement of Interested Parties

### *A. Public Notice*

Summary of Comments

Some commenters argued that it would be premature to designate any National Corridors without a full disclosure of the data and analysis underlying the conclusions in the Congestion Study. NYPSC, the Maine Public Utilities Commission (Maine PUC), and NARUC argued that the Department must perform a more granular analysis of congestion before designating a National Corridor; according to these commenters, the Congestion Study alone does not provide an adequate record of how the conclusions about congestion were reached. PAPUC stated that while the Congestion Study is a good initial assessment of congestion at the national level, designation of specific National Corridors cannot be based on the preliminary analysis contained in the Congestion Study; according to PAPUC, more specific and focused regional studies must be conducted prior to any designation. A number of commenters argued that the Congestion Study fails to provide adequate notice of a National Corridor designation under the Administrative Procedure Act, 5 U.S.C. 551.[32]

DOE Response

The Department notes that as of September 27, 2006, it made available on its Web site non-proprietary data relied on in the Congestion Study. Moreover, as discussed further below, the Department in this notice is identifying the specific data on which it is relying to establish the existence of congestion or constraints adversely affecting consumers, to explain the reasons the Secretary is considering exercising his discretion to designate a National Corridor, and to explain how

[29] Drawing National Corridor boundaries broadly may also help encompass transmission upgrades needed to address ''loop flow.'' Loop flow is a phenomenon of alternating current transmission networks in which electricity flows seek their own paths, sometimes in patterns unanticipated by system operators. Thus, a transmission improvement designed to correct a congestion problem on one part of the transmission system may in some cases cause loop flows elsewhere that must also be addressed.

[30] The Department acknowledges that this approach to establishing boundaries for National Corridors under FPA section 216(a) differs from the approach being used for energy right-of-way corridors on Federal land under EPAct section 368. However, given the distinct purposes of FPA section 216 and EPAct section 368, the Department believes that applying different approaches to the two different types of corridors is appropriate. *See Env't Def.* v. *Duke Energy Corp.*, No. 05–848, slip op. at 10 (U.S. April 2, 2007) (''A given term in the same statute may take on distinct characters from association with distinct statutory objects calling for different implementation strategies.'')

[31] *See* FERC Order No. 689, 71 FR 69,440, 69,446, 117 FERC ¶ 61,202 at P 41 (''The Commission will review the proposed project and determine if it reduces the transmission congestion identified in DOE's study and if it will protect or benefit consumers.''); and 71 FR 69,440, 69,468, 117 FERC ¶ 61,202 at pp. 128–29 (§ 50.6(f) requires applicants to demonstrate that the conditions of FPA sec. 216(b)(2)–(6) are met).

[32] *See* comments of Upper Delaware Preservation Coalition, Delaware Riverkeeper Network, SayNo2NYRI, Upstate NY Citizens Alliance, and Stop NYRI, Inc. (collectively Delaware River Commenters), Communities Against Regional Interconnection (CARI) and Toll Brothers, Inc. (Toll Brothers).

the specific boundaries of the draft National Corridors were delineated. Commenters will have a full opportunity to comment on those data.

*B. State Consultation*

Summary of Comments

A number of commenters raised concerns about the level of consultation with States. Several commenters asserted that the Department failed to consult with the States in New England in the preparation of the Congestion Study.[33] NARUC commented that the Department failed to consult with States in some regions. Other commenters argued that the Secretary should not designate any National Corridors without further consultation with affected States.[34]

DOE Response

FPA section 216(a)(1) requires that the Department conduct its congestion studies ''in consultation with affected States.'' FPA section 216(a)(2) then states that ''[a]fter considering alternatives and recommendations from interested parties (including an opportunity for comment from affected States), the Secretary shall issue a report, based on the study, which may designate * * * [National Corridors].'' The Department is committed to fulfilling its obligation to consult with States in this process. At the same time, the Department notes that there are practical difficulties in conducting the level of consultation that some may prefer in the context of a study of this magnitude, which examines congestion over 150,000 miles of transmission lines throughout 47 States and the District of Columbia, within statutorily mandated deadlines. Moreover, the statute refers to conducting the congestion study in consultation with ''affected States.'' It is difficult to know which States are ''affected'' until the conclusions of the congestion study are known.

The Department has provided States with numerous opportunities for input and has held meetings with officials representing individual States and groups of States. The Department initiated a series of conference calls in December 2005 and January 2006 with States to describe the Department's study plan and request information and suggestions. On February 2, 2006, the Department published a Notice of Inquiry explaining the Department's intended approach for the Congestion Study and inviting comment. On March 29, 2006, the Department held a public technical conference in Chicago, Illinois to address the questions presented in the Notice of Inquiry. The Congestion Study itself was made available for comment on August 8, 2006. In addition, the Department held numerous meetings with State officials to discuss the Congestion Study and made presentations at several State conferences and events.[35]

As indicated by its outreach efforts in connection with the Congestion Study, the Department recognizes the importance of State consultation. The Department further recognizes that the most significant stage of the entire process under FPA section 216(a) is the National Corridor designation stage. Therefore, in addition to making the draft National Corridor designations described in this notice available for comment, the Secretary is simultaneously contacting the Governors of each State in which the draft National Corridors would be located to arrange consultation meetings.

## V. Environmental and Cultural Analyses

*Summary of Comments*

The Department received several comments proposing that the Department prepare a Programmatic Environmental Impact Statement (PEIS), pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347) (NEPA), before designating any National Corridors. Specifically, some commenters state that designating a National Corridor is equivalent to establishing a plan for routing transmission lines and, therefore, must be evaluated in a PEIS.[36] Other commenters argue that a National Corridor designation is not just a plan for routing of transmission lines, but rather would amount to a de facto permitting of a specific, identifiable transmission line for which a PEIS or an Environmental Impact Statement must be prepared.[37]

Several commenters also asserted that the designation of a National Corridor selects a transmission-based solution to congestion rather than alternative energy solutions such as siting local generation or increased demand response. These commenters argue that DOE should conduct a PEIS that considers alternatives to transmission-based solutions to congestion prior to designating a National Corridor.[38]

Other commenters note that the Council on Environmental Quality's regulations implementing the procedural provisions of NEPA (40 CFR 1500–1508) require that NEPA be applied at the earliest possible time in the planning process and contend that, therefore, DOE should prepare a PEIS prior to any designation of a National Corridor.[39] Still other commenters state that DOE should prepare a PEIS before designating a National Corridor because a PEIS would allow DOE to examine not just environmental impacts from individual projects but also cumulative environmental and non-environmental impacts, including socioeconomic impacts.[40]

The Department also received comments that it should conduct other environmental and cultural analyses, such as a review under the National Historic Preservation Act (16 U.S.C. 470) (NHPA), before designating National Corridors.[41] For example, the Advisory Council on Historic Preservation states that the Department should conduct a ''tiered'' approach under the NHPA, and that the Department should designate National Corridors that are broad enough to ensure that feasible alternatives to mitigate potential adverse effects to historic properties may be developed and evaluated at a later stage.

*DOE Response*

Section 102(2)(C) of NEPA requires that all Federal agencies include an environmental impact statement in

[33] *See* comments of Maine PUC, New England Conference of Public Utility Commissioners (NECPUC), Connecticut Attorney General, New England Governors' Conference, Inc., and Maine Congressional Delegation.

[34] *See, e.g.*, comments of the Governor of the Commonwealth of Virginia, Arizona Corporation Commission (Arizona Commission), and American Transmission Company LLC.

[35] National Conference of State Legislatures, Seattle, WA, Aug. 18, 2005; Southern States Energy Board, Atlanta, GA, Aug. 27, 2005; Midwest State Energy Office, webcast, Aug. 31, 2005; National Association of State Energy Officials, New York, NY, Sept. 12, 2005, and Washington, DC, Feb. 7, 2006; CREPC, San Diego, CA, Sept. 20, 2005, and Sept. 27, 2006, and Portland, OR, April 4, 2006; NARUC, Palm Springs, CA, Nov. 14, 2005, Washington, DC, Feb. 14 and 22, 2006, San Francisco, CA, Aug. 1, 2006, and conference calls, Jan. 11, 2006, and June 16, 2006; NYPSC, Albany, NY, Dec. 20, 2005; OMS, conference call, May 11, 2006; Florida Public Service Commission, Tallahassee, FL, June 15, 2006; Midwestern Legislative Conference, Chicago, IL, Aug. 20, 2006; Organization of PJM States, Inc., Cambridge, MD, Sept. 17, 2006; CPUC, conference call, Sept. 20, 2006; CEC, conference call, Sept. 22, 2006; and Maine PUC, conference call, Oct. 6, 2006.

[36] *See e.g.*, comments of Delaware River Commenters.

[37] *See, e.g.*, comments of National Trust for Historic Preservation and numerous individuals.

[38] *See, e.g.*, comments of PEC and Virginia Chapter of the Sierra Club (Sierra Club); *see also* comments of U.S. Sen. Warner and U.S. Rep. Wolf.

[39] *See, e.g.*, comments of CARI.

[40] *See, e.g.*, comments of Wilderness.

[41] *See, e.g.*, comments of Civil War Preservation Trust, Foundation of the State Arboretum of Virginia, and National Parks Conservation Association.

''every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.'' 42 U.S.C. 4332(2)(C). The designation of a National Corridor under FPA section 216(a)(2) does not significantly affect the quality of the human environment. To the contrary, as described in Section I.A above, a National Corridor designation is not a determination that transmission must, or even should, be built; it is not a proposal to build a transmission facility and it does not direct anyone to make a proposal. Nor does the Department's designation of a National Corridor result in or plan for any ground-breaking environmental impacts. Nor does National Corridor designation irrevocably commit any resources to any activity having foreseeable environmental impacts. Designation of a National Corridor does not control FERC's substantive decision on the merits as to whether to grant or deny a permit application, specifically where any facilities covered by a permit should be located, or what conditions should be placed on a permit. Further, as discussed in Section III above, the Department has decided not to establish the boundaries of today's draft National Corridors using a project-centerline approach that would give an advantage to a particular transmission line. As discussed in Section I.A above, the Department's approach to National Corridor designation does not foreclose future options for addressing congestion, including non-transmission options. For these reasons, National Corridor designation is not a ''proposal for a major Federal action significantly affecting the quality of the human environment'' that falls within the purview of NEPA.

While NEPA review is not required at this time, all proposals for Federal siting permits will be subject to, as appropriate, project-specific NEPA review. In addition to NEPA, proposals for such permits will also be subject to other environmental and cultural reviews, including, but not limited to, review under the NHPA.[42] Nothing in FPA section 216 alters the applicability of Federal environmental and cultural statutes and regulations.

## VI. Duration of National Corridor Designations

*Summary of Comments*

The Congestion Study solicited comment on whether National Corridor designations should be permanent or whether the Department should set an expiration date. Most commenters did not address this question. Most of those who did said that DOE should not set a standard duration period for National Corridor designations. SCE, for example, said that relevant conditions would vary too much from case to case, and that DOE should establish a period suitable to a given National Corridor and then work with affected parties to determine when or if the designation should be terminated. APS emphasized that the development of transmission facilities is often a protracted process; that the initial designation should be for a considerable period; and that thereafter DOE should ensure that a designation does not expire in a manner that would disadvantage existing efforts to relieve congestion problems. EEI said that designations should not have any fixed duration; rather, they should simply remain in force until rescinded by DOE. EEI argued that DOE should stipulate in its designations that it reserves the right to rescind a designation if it finds that the designation is no longer needed, and that it would revisit the need for existing designations in its periodic studies and reports. EEI also emphasized the need for DOE to ensure that it did not rescind a designation prematurely.

Wilderness noted that DOE is to update its congestion study every three years, and suggested that DOE should reassess the need for existing National Corridors as part of each three-year study. Similarly, the York County Planning Commission said that designations should be for three-year terms, subject to renewal or rescission based on the findings in the updated congestion analyses.

PJM Interconnection, LLC, (PJM)[43] recommended that DOE designate National Corridors for an initial 10-year term, and stipulate the Secretary's right to rescind or modify the terms or boundaries of a National Corridor at any time after showing that such action was appropriate.

*DOE Response*

DOE appreciates the need to be responsive to the broad range of factors and considerations pertaining to the duration of National Corridor designations. It also recognizes that designations, once made, should be in place for a considerable period of years, with the possibility of either rescission or renewal for cause. Accordingly, DOE intends to adopt a default approach, under which an initial designation would be for a period of 12 years unless it finds reason in a particular case to set some other initial term. Notwithstanding this approach, the Department recognizes the disruptive effect that regulatory uncertainty can have on transmission investment. Therefore, the Department does not intend to terminate any National Corridor designations while an accepted permit application in that National Corridor is pending at FERC, or, once FERC has granted a permit, during the period in which the approved facilities are being constructed. The Department will stipulate in any National Corridor designation order that the designation may be modified, rescinded, or renewed for cause at any time, after a period of public notice and comment and consideration of the comments.

## VII. Technical Comments on the Congestion Study

In this section, the Department summarizes and responds to technical comments it received on the Congestion Study that are relevant to today's draft National Corridor designations. Specifically, the Department first summarizes and responds to those comments on the data and methodology used in the Congestion Study that have general relevance to any National Corridor designation. Then, the Department summarizes and responds to comments on the Congestion Study that have particular relevance to the draft National Corridor designations in this notice. As mentioned above, today's notice does not address comments received on the Congestion Study that relate solely to areas outside the two Critical Congestion Areas or that relate to the conduct of future congestion studies.

*A. Comments of General Relevance*

Several commenters commended DOE for its efforts in completing the first national electric transmission congestion study and advancing the discussion on transmission congestion. NARUC stated, ''The DOE's successful development of a base case electric load flow model in a single year for the entire Eastern Interconnection is a significant achievement.'' First Energy commented that ''DOE seems to have relied on appropriate information to support its conclusions in the Congestion Study. DOE seems to have made reasonable assumptions about the electric infrastructure that will be in use and seems to have relied upon reasonable modeling methods with respect to identifying potential future transmission constraints.''

[42] *See* FERC Order No. 689 discussed in n.4.

[43] PJM is the RTO serving parts or all of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

The Midwest ISO remarked:

> The classification of congested areas into Critical Congestion Areas, Congestion Areas of Concern, or Conditional Congestion Areas is an appropriate means to distinguish between varying characteristics of these congested areas * * *. Overall, the method employed to identify congested areas is an appropriate combination of available historical data, transmission studies by planning organizations, and simulation of future congestion.

EEI applauded the Department for the timely completion of the Congestion Study, stating, ''In light of the strong emphasis on electric infrastructure made by the Congress in enacting EPAct, the congestion study identifies a broad range of critical geographic areas throughout the nation that face potentially serious challenges for ensuring reliable and cost-effective electricity delivery.''

International Transmission Company stated that as a general matter, ''the Congestion Study did a commendable job of identifying areas of the United States in which congestion represents an economic problem, i.e., where densely populated, economically significant regions of the country face limited access to economic sources of electricity as the result of transmission congestion.'' However, the Department also received comments expressing concern about several general aspects of the Congestion Study, as discussed below.

1. Data Sources

*Summary of Comments:* ODEC stated that the Department should not rely solely on RTOs and ISOs for data, asserting that their processes are not totally open, collaborative and inclusive. Toll Brothers asserted that rather than conduct its own Congestion Study, the Department has relied too much on industry sources, such as PJM, Allegheny, and transmission owners who wheel power for low-cost providers into higher priced markets.

*DOE Response:* The Department did not rely solely on data and information from any single source or category of sources. The Department contacted a wide range of stakeholders for publicly available and current data. Through the notice of inquiry and technical conference the Department opened the call for data to all entities. Furthermore, the Department performed its own review of the information provided.

2. Congestion Metrics

*Summary of Comments:* The Department received a number of comments on the use of congestion rents to measure congestion. ODEC supported the use of congestion rents as a congestion metric. However, several commenters complained that congestion rent can significantly overstate the economic effect of congestion because the figure does not account for hedging. NYISO argued that the proper metric to measure congestion is potential production cost savings not gross congestion rent, which ''is merely an accounting protocol that does not recognize the offsets that exist under various hedging instruments and grandfathered contract arrangements.'' Similarly, NYPSC argued that gross congestion rent is a misleading metric that significantly overstates the cost of congestion by failing to factor in the return of some congestion revenues to loads. NYPSC argued that the Department should measure congestion by analyzing the additional cost of local generation required to serve customers in a load pocket.[44] Toll Brothers argued that under FPA section 216(a), the Department may only consider economic factors after the Department has demonstrated that congestion exists, and the demonstration of the existence of congestion must be based on an analysis of the transmission system's physical capability of meeting the demand for electricity. According to Toll Brothers, if demand can be met, then there is no congestion, regardless of the relative price of the power needed to meet that demand.

Other commenters argued that congestion rent has limited relevance outside of organized markets, and thus the Congestion Study significantly underestimated congestion and constraints in the areas of the country without such markets. Several commenters from the Southeast, for example the Public Works Commission of the City of Fayetteville, North Carolina, expressed concern that the Study had missed significant congestion problems and urged the Department to consider other types of information, such as lack of long-term firm transmission capacity. NRECA and NEC also argued for use of alternative metrics, including available transfer capacity. Western commenters, including NWPUD and SCL, noted that the need to look at alternative metrics, such as withdrawn or declined transmission requests, limits on scheduling rights, or real-time schedule curtailments, is particularly important in the Northwest, given that power there is obtained solely through bilateral markets. NWPUD and SCL assert that modeling congestion using production cost simulations may be misleading since most of the Western Interconnection uses contract path methods for acquiring, reserving, and scheduling transmission service. Duke noted that because areas without formal markets are generally served by vertically integrated utilities, the type of LMP-based congestion data typically provided by RTOs and ISOs are often not available. PSEG asserted that the Congestion Study is biased towards regions that use LMP because the Study is only capable of measuring congestion in LMP-type markets. PSEG concluded that this inherent bias is not properly recognized or addressed in the Study, as is evidenced by the fact that the Congestion Study contains no significant congestion findings for areas without organized markets. NCEP asserted that lack of data for the Southeast and parts of the West, where organized markets do not exist, presents a significant gap in the knowledge available to the Department to determine the need for National Corridors in those regions. NCEP further asserted that the fact that data from these areas are not available does not mean that congestion does not exist.

*DOE Response:* The Department recognizes that the Congestion Study's use of congestion rent as a metric has led to concern and confusion. The Department did not intend to suggest that congestion rents represent the actual monetary cost that consumers pay specifically as a result of congestion, or that congestion rents measure the benefits of relieving the congestion. The Department recognizes that outside of the organized markets that use LMP-based congestion management, transmission customers do not pay congestion rents *per se.* The Department further recognizes that within the organized markets that use LMP-based congestion management, financial transmission rights can provide load-serving entities with significant protection from the payment of congestion rents, although as the system becomes more constrained the availability of those rights may not be able to protect consumers from the full effects of congestion. Also, the Department recognizes that congestion rents are not the same as the cost of redispatch, a cost that some combination of transmission customers actually pay specifically as a result of congestion.

Nevertheless, congestion rents are an indicator of the existence of congestion, since if there is no congestion, there are no rents, and whenever there is congestion, congestion rents can be calculated. The Congestion Study modeled congestion rents for areas with

[44] *See also* comments of PSEG.

organized markets in the same way it modeled congestion rents for areas without organized markets. For both types of areas, the models determined congestion rent for a particular constraint by calculating a shadow price for that constraint and multiplying the shadow price by the megawatt (MW) flow on the constraint. For each constraint, models compute hourly shadow prices as marginal costs of redispatch required to relieve congestion (if any) on that constraint in each hour, taking into account the differences in production costs among the appropriate generators. Nevertheless, in most organized markets, RTOs and ISOs calculate LMPs and make them publicly available; whereas in areas without organized markets, there is less transparency with regard to the actual marginal cost of redispatch. Thus, the Congestion Study's modeling of congestion rents for areas with organized markets is easier to validate than for areas without organized markets.

With regard to the recommendation that the Department use changes in bid production cost instead of congestion rent to measure congestion, the Department concludes that use of bid production cost in the context of FPA section 216(a) congestion studies is not required. Bid production cost analysis compares a base case against different scenarios in which action is taken to alleviate congestion or constraints. By contrast, the Department is specifically *not* seeking to assess the benefits of different fixes to a congestion or constraint problem. Rather, the Department is simply identifying congestion or constraint problems, and the geographic areas in which these problems exist.

While the Department believes that congestion rent, when correctly understood, is a useful indicator of the persistence and pervasiveness of congestion within a transmission system, congestion rent was only one of the metrics used in the Congestion Study. Further, as discussed in Section II.A above, while FPA section 216(a) requires a National Corridor designation to be based on the existence of constraints or congestion that adversely affects consumers, once the Department has demonstrated the existence of persistent congestion, no additional demonstration, let alone monetization, of the adverse effects on consumers is required. Thus, in the draft National Corridor designations detailed below, the Department relies on historical binding hours and a range of other indicators to support its conclusion that the areas are experiencing persistent congestion and that National Corridor designation is appropriate. For the purposes of future congestion studies, the Department is considering whether other metrics, in addition to or instead of congestion rents, are appropriate, particularly in those areas without organized markets.

3. Direct Current Versus Alternating Current Modeling

*Summary of comments:* Some commenters, including NARUC, NYPSC, and PAPUC, asserted that the direct current (DC) model used by the Department for the Eastern Interconnection is oversimplified, does not adequately reflect the system, may understate congestion, cannot take into account voltage-related constraints, and therefore will not include any congestion caused by such constraints. According to these commenters, the impact of voltage-related constraints can be significant and should not be overlooked in the Congestion Study. These commenters argued that alternating current (AC) modeling (including thermal, voltage, and stability analyses under both normal and contingency conditions) should be used on a sub-regional basis to provide more detailed analysis of the areas identified as problematic through the DC modeling.

*DOE response:* For the Eastern Interconnection, modeling was performed using GE–MAPS, a commercially available simulation tool. GE–MAPS uses a DC representation of the load flow, which does not model reactive power requirements directly. Use of indirect approaches to account for reactive power is not unusual in electric analysis. For example, many well-known operational constraints in PJM, such as the Eastern, Central, and Western interfaces are proxies for reactive power limitations downstream. PJM specifies the MW limit (real power) to ensure that the capacity of local units to provide sufficient reactive power is not exceeded. It is not possible to conduct a full-scale AC power flow modeling exercise (with forward-looking unit commitment and hourly chronological dispatch) of the Eastern Interconnection using today's computational resources. While sub-regional analyses using AC modeling may be feasible, the Department does not believe that such analyses are necessary, given the purpose of the Congestion Study and the effect of any National Corridor designation, as discussed in Section I.A above.

4. Marginal Versus Average Losses

*Summary of comments:* Commenters, including NJBPU, asserted that using average costs for transmission losses (instead of marginal costs) for the entire Eastern Interconnection understates the congestion in certain areas. Specifically commenters pointed out that the PJM plan to adopt marginal losses as of June 2007 is not included and although the Florida Reliability Coordination Council sub-region uses marginal losses, the Congestion Study modeled that sub-region using average losses. In the West, the Western Electricity Coordinating Council (WECC) noted that its results showed that improvements are needed to address this issue.

*DOE response:* It is true that the Congestion Study modeled average losses for all regions. Although in some regions transmission losses are charged based on average cost and in others they are charged based on marginal cost, the models used in the Congestion Study require the use of either average or marginal losses for the entire model footprint. In future congestion studies, it may be more appropriate to model marginal losses in all regions.

5. Aggregation of Nodes

*Summary of comments:* Some commenters expressed concern that the Congestion Study's aggregation of the Eastern Interconnection's load and generation pockets into 253 nodes and analysis of the load flow patterns among them resulted in many local areas of congestion and localized transmission constraints not being identified or described. For example, Northern Indiana Public Service Company pointed out that not all congestion is on major transmission facilities and claims that flow on some major lines is limited by the potential of contingency overloads on secondary transmission lines contained within a node. Similarly, First Energy and SCL noted that the level of analysis does not present enough detail on their respective areas. ODEC claimed that the Department's node analysis should be made in conjunction with a more localized analysis of all nodes within a congested area. Otherwise, ODEC asserted that an aggregated approach is likely to result in congestion being understated because the implicit netting of adjacent buses may inadvertently offset one against another.

*DOE response:* In the modeling of the Eastern Interconnection for the Congestion Study, congestion was calculated at all constraints known to have been previously identified for monitoring by regional reliability

councils, RTOs, ISOs, and transmission owners. This calculation was wholly separate from the aggregation of the Interconnection into the 253 nodes, which was done later in the analytic process to identify broad patterns of power flows from sources to sinks and determine the principal transmission elements involved. Accordingly, all congestion at the identified locations was estimated and reported in the model's outputs. Any failure to flag real-world congestion through this approach should be traceable to either of two problems, or some combination of them: (1) a failure to identify a real-world constraint as appropriate for monitoring in the model; or (2) a disparity between the modeled results and real-world experience. The Department intends to explore this issue further in future congestion studies, and looks forward to working on it with interested entities.

6. Fuel Prices

*Summary of comments:* Commenters such as ODEC, ConEd, and Toll Brothers cautioned the Department against reliance on fuel scenarios. ODEC argued that evaluating different fuel price scenarios implies that fuel price is a driver in transmission congestion, when in fact it is the lack of sufficient transmission capacity that is the principal driver of transmission congestion. ConEd and PEC stated that the Department's assumption of an increasing price difference between coal-fired generation and natural-gas- and oil-fired generation is unrealistic. EPSA cautioned that the extreme weather conditions such as were experienced during 2005 and the related natural gas price impacts associated with hurricanes Katrina and Rita should not inflate assessments of the duration of congestion over the lifetime of a transmission asset.

*DOE response:* The Department did not intend to suggest in the Congestion Study that fuel price is the only factor creating congestion. In fact, congestion can exist in the complete absence of fuel price differences when generation capacity in a load pocket combined with transmission capacity to import energy is insufficient to meet demand. Further, in the absence of such a reliability problem, fuel price differences between locations on the grid will not result in congestion if transmission capacity is adequate to accommodate the demand for the cheaper power. The modeling performed in the Congestion Study resulted in similar locational patterns of congestion under each fuel price scenario, but with different congestion costs. The cost differences reflect the marginal generation costs, but the locations reflect the underlying transmission system topology. Moreover, the constraints that were identified generally are well-known constraints that have been long observed.

Contrary to the assertion of ConEd and PEC, natural gas and oil prices were assumed to drop in the base case of the Congestion Study over the time period of 2006 through 2015, thus narrowing the price spread between coal-fired generation and natural-gas- and oil-fired generation. What is more important is that the analysis considered three distinct fuel price scenarios which offer dramatically different relationships between the prices of natural gas and coal. At the same time, transmission problems identified in the Congestion Study as persistent are those that appear under all fuel price scenarios.

7. Seams

*Summary of comments:* ConEd expressed concern that the Congestion Study did not effectively take into account congestion caused by seams. ConEd asserted that, given the differences in market design between PJM and NYISO, market inefficiencies may produce congestion costs while in fact the lines are underutilized.

*DOE response:* The Department acknowledges that seams are an important issue in the analysis of congestion.[45] In the modeling conducted for the Eastern Interconnection in the Congestion Study, seams were reflected by means of the hurdle rates used for commitment and dispatch and the use of a ''commitment by pool'' modeling logic. It may be appropriate in future congestion studies to consider additional analysis of the effects that seams are having on congestion. However, the Department does not believe that the congestion that has led to today's draft National Corridors is primarily a result of interregional differences in market design.

8. Line Outages

*Summary of comments:* NWPUD and SCL question whether the Congestion Study adequately accounted for lengthy maintenance outages on transmission lines in the Western Interconnection.

*DOE response:* In the Western Interconnection, the transmission system is assumed intact when rating studies are conducted to determine the maximum capability, or Total Transfer Capability (TTC) of a path. In addition, seasonal Operating Transfer Capability (OTC) ratings are conducted for critical paths in the Interconnection. These studies assume system conditions expected to occur in the near term, such as long-term transmission or resource outages. The western studies used in the Congestion Study did de-rate some paths below their maximum path capability to account for the fact that operationally, they are often held below the maximum limits. The Pacific AC and DC Interties and the tie between Alberta and British Columbia are three examples that were de-rated in the studies to account for issues like those raised by SCL and Northern Wasco. The Department will consider additional approaches to handling the effects of line outages in future congestion studies.

*B. Comments Specific to the Mid-Atlantic Critical Congestion Area*

Summary of Comments

PEC noted differences between the load data used in the Congestion Study and the PJM Load Forecast Report 2006 and suggested that a detailed review and validation of the data is warranted. PEC, ConEd, and LIPA argued that the Department should revise the Congestion Study to reflect the data in NYISO's final 2006 Comprehensive Reliability Plan.

DOE Response

When preparing the Congestion Study, the Department made every effort to include the most current and best available data. The specific reports cited above were not available at that time, and the Department therefore relied on 2005 data. Nevertheless, the Department has reviewed the information cited by commenters and concludes that it does not alter the analysis set forth below concerning the draft designation of National Corridors.

Summary of Comments

National Grid suggested that the geographic area from Albany and Utica to New York City should be included within the Mid-Atlantic Critical Congestion Area.

DOE Response

The Department agrees that it is appropriate to include this area within the Mid-Atlantic Critical Congestion Area, and as discussed below, the Department has included this area in the draft Mid-Atlantic Area National Corridor.

Summary of Comments

PSEG believed that the Mid-Atlantic Critical Congestion Area identified by the Congestion Study is too broad. PSEG

[45] Seams are interregional differences in market design that result in market inefficiencies.

claimed that the Department's broad designation essentially means that each region and each city within this area suffers from the same type and degree of congestion problem. Given the unique transmission topology of the sub-regions, PSEG claimed that it is unlikely that each sub-region is experiencing the same degree of congestion.

DOE Response

DOE agrees that this broad area is not homogeneous and that congestion is not uniformly distributed. Nevertheless, as the entire region is downstream of significant constraints, congestion occurs to one degree or another across the entire area.

Summary of Comments

PSEG noted that the Congestion Study says (p. 41) that transmission congestion problems are worsening in southeastern New York, in New York State as a whole, in New Jersey, and in the Delaware River Path. PSEG added that the Study does not provide data applicable to PJM to support these assertions. Further, PSEG cited PJM's 2005 State of the Market Report as showing that although total gross congestion was rising in the PJM footprint over the 6-year period between 1999 and 2005, this was occurring as the geographic size of PJM's market was growing, and the level of gross congestion, as a percentage of total PJM billings, remained relatively consistent at about 8 percent (plus or minus 2 percent) per year.

DOE Response

DOE believes that the information it cites on pp. 42–43 of the Congestion Study strongly supports the assertions made on p. 41. Concerning congestion and PJM's expansion, DOE notes that from 1999 through 2005, PJM was expanding into relatively uncongested areas, while congestion was rising sharply in PJM's original, ''classic,'' footprint. Thus, although total congestion for PJM's footprint remained relatively consistent as a percentage of total PJM billing is true, that is not particularly relevant. The rapid increase in congestion in the eastern portion of PJM's footprint can be demonstrated in two ways. One way is to compare total annual congestion costs in the PJM footprint with total transmission revenue requirements (adjusting the latter figure as appropriate to take PJM's broadening footprint into account). As shown in Table VII–1, congestion costs rose from 7.4 percent of transmission revenue requirements in 1999 to 107.9 percent of these requirements in 2005. These figures suggest that the demands on the transmission system in PJM's footprint were increasingly intensive over this period.

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**Table VII-1. PJM Transmission Revenue Requirements and Historical Congestion**

| Transmission Pricing Zones | Zonal Revenue Requirement | Transmission Revenue Requirement ($ millions, adjusted by year as expansion zones were integrated into PJM) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
| American Electric Power | $486,074,331 | | | | | | 122 | 486 |
| Commonwealth Edison | $271,535,847 | | | | | | 181 | 272 |
| Dayton Power & Light | $40,100,000 | | | | | | 10 | 40 |
| Dominion Virginia Power Company | $155,000,000 | | | | | | | 103 |
| Duquesne Light Company | $30,767,631 | | | | | | | 31 |
| **Subtotal PJM Expansion** | **$983,477,809** | | | | | | **313** | **932** |
| | | | | | | | | |
| Allegheny Power | $128,000,000 | | | | | 96 | 128 | 128 |
| Atlantic City Electric Company | $44,552,519 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Baltimore Gas & Electric | $93,045,818 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Delmarva Power & Light Company | $59,230,905 | 59 | 59 | 59 | 59 | 59 | 59 | 59 |
| FirstEnergy (JCPL, Meted, Penelec) | $141,000,000 | 141 | 141 | 141 | 141 | 141 | 141 | 141 |
| PECO Energy | $151,703,000 | 152 | 152 | 152 | 152 | 152 | 152 | 152 |
| Potomac Electric Power Company | $93,558,866 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| PPL Group (PPL, AEC, UGI) | $125,680,702 | 126 | 126 | 126 | 126 | 126 | 126 | 126 |
| PSE&G | $158,694,375 | 159 | 159 | 159 | 159 | 159 | 159 | 159 |
| Rockland | $11,785,928 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| **Subtotal Other PJM** | **$1,007,252,113** | **879** | **879** | **879** | **879** | **975** | **1,007** | **1,007** |
| | | | | | | | | |
| **Total PJM Rev Req ($M)** | **$1,990,729,922** | **879** | **879** | **879** | **879** | **975** | **1,320** | **1,939** |
| **Congestion (from PJM 2005 Mkt Report)** | | **65** | **132** | **271** | **453** | **464** | **750** | **2,092** |
| **Congestion Cost as % PJM Rev Req** | | **7.4%** | **15.0%** | **30.8%** | **51.5%** | **47.6%** | **56.8%** | **107.90%** |

Sources: Congestion figures from the 2005 PJM State of the Market Report, Table 7-2. Zonal Revenue Requirement from Bethel Direct Testimony, Exhibit AEP-203, Column 2, in FERC Docket EL05-121-000.

Another way to see that congestion was growing rapidly in the eastern portion of PJM's footprint during this period is to compare historical changes in LMPs for the utilities in ''classic PJM.'' As shown in Figure VII–1, the LMPs for the eastern utilities in ''classic PJM'' were generally increasing between 2002 and 2005 or 2006, as compared to the LMP for Penelec, which is in ''classic PJM'' but located west of most of PJM's major constraints.

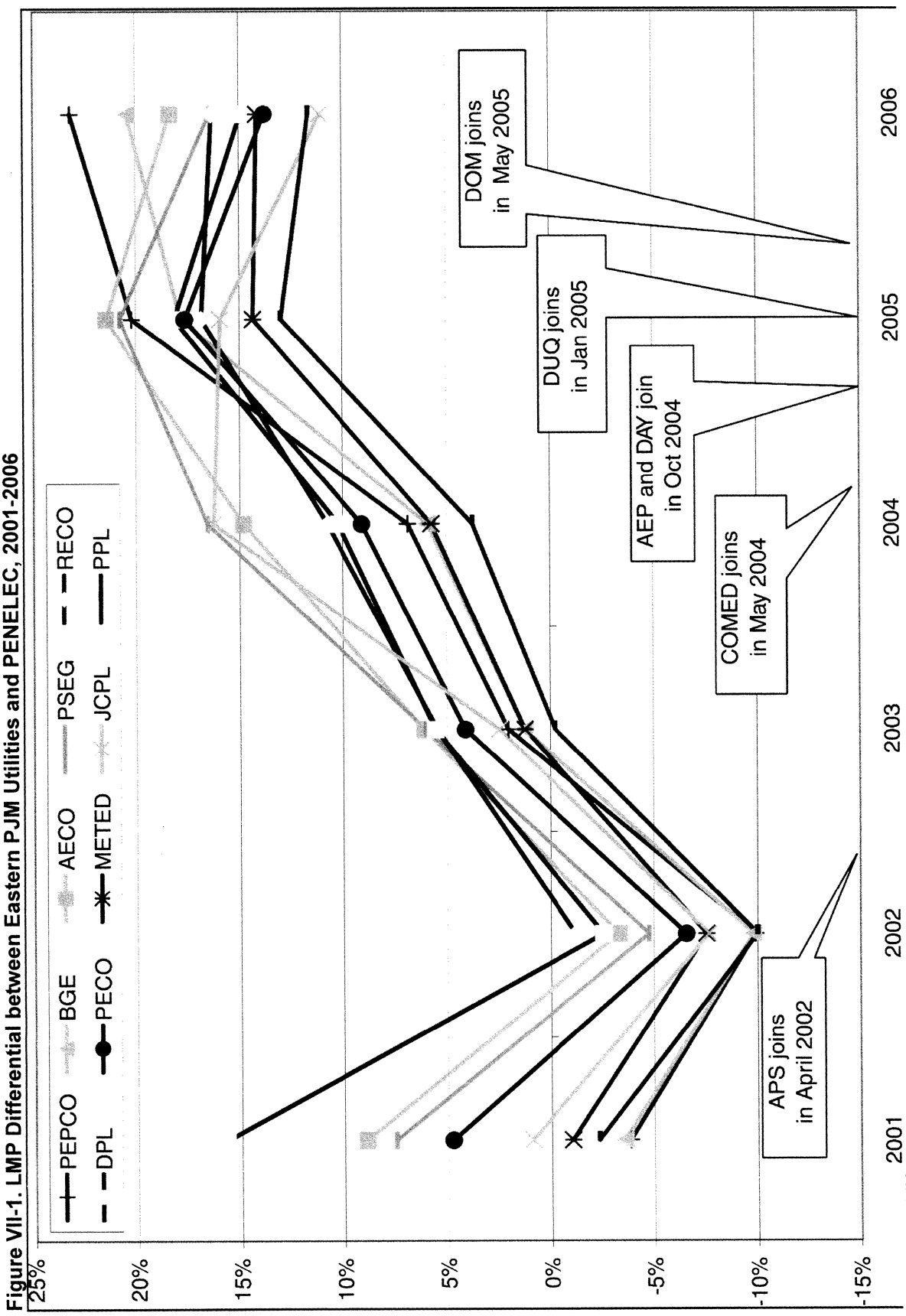


**Figure VII-1. LMP Differential between Eastern PJM Utilities and PENELEC, 2001-2006**

Data source: PJM.

Summary of Comments

NYPSC and NYISO expressed concern about the accuracy of the data underlying the Congestion Study, noting that the modeling results indicated, contrary to NYISO's 2005 State of the Market Report, that the amount of congestion in upstate New York is relatively high compared to the amount of congestion in southeastern New York.

DOE Response

NYISO market data on congestion are not directly comparable to the Congestion Study's simulation results for several reasons. First, NYISO's 2005 State of the Market Report relies on real-time congestion data. The Congestion Study simulations reflect forward-looking unit commitment in response to predictable loads and therefore should be compared to day-ahead data.[46] Analysis of historical day-ahead LBMP prices indicates that price differences in upstate New York (Zone A [West] to Zone G [Hudson Valley], and Zone G to Zone I [Dunwoodie]) are becoming increasingly more significant compared to price differentials in downstate New York (Zone I to Zone J [New York City]) as shown in Table VII–2. This indicates that transmission limitations of the upstate system in NYISO are becoming at least as influential as downstate limitations.

**Table VII-2. Historical Day-Ahead LBMPs and NYISO Price Differentials**

| | Zone A (West) | Zone G (Hudson Valley) | Zone I (Dunwoodie) | Zone J (NYC) | A to G Differential | G to I Differential | I to J Differential |
|---|---|---|---|---|---|---|---|
| 2004 | 44.75 | 52.44 | 53.44 | 63.02 | 7.69 | 1.00 | 9.58 |
| 2005 | 64.80 | 78.90 | 81.26 | 93.17 | 14.10 | 2.36 | 11.91 |
| 2006 | 50.24 | 64.07 | 65.49 | 70.90 | 13.82 | 1.42 | 5.41 |

Data source: NYISO.

Second, the Congestion Study simulations reflect ''planning'' interface definitions and limits published by NYISO whereas NYISO's 2005 State of the Market Report is based on operational interface limits. Table VII–3 presents a comparison of planning limits and operating limits. For the upstate system, the planning limits are more stringent than the operating limits. For example, the planning limit reported by NYISO for Moses South used in the Congestion Study ranges between 1300 MW and 1700 MW. However, the operating limit for that interface used in NYISO operations ranges between 2550 MW and 2875 MW. On the other hand, for the downstate system, the planning limits are less stringent than the operating limits. For example, the planning limit reported by NYISO for UPNY-ConEd used in the Congestion Study ranges between 4850 MW and 5750 MW, whereas the operating limit for that interface used in NYISO operations ranges between 3300 MW and 3950 MW. The combination of looser upstate operational limits and tighter downstate operational limits compared with the planning limits employed in the Congestion Study results in a shift in congestion in the Congestion Study's modeling from downstate to upstate New York.

**Table VII-3. NYISO Planning and Operating Limits for Interfaces**

| Interface | Planning Interface Limits | | Operating Limits | |
|---|---|---|---|---|
| | Normal | Emergency | Normal | Emergency |
| Dysinger East | 2,400 | 2,475 | 2,850 | 3,175 |
| West Central | 1,100 | 1,175 | 1,775 | 2,075 |
| Volney East | 4,325 | 4,400 | NA | NA |
| Moses South | 1,300 | 1,700 | 2,550 | 2,875 |
| Central East | 2,625 | 2,800 | 2,975 | 3,400 |
| Total East | 5,150 | 5,800 | 5,075 | 5,975 |
| UPNY-SENY | 4,475 | 5,125 | NA | NA |
| UPNY-Coned | 4,850 | 5,750 | 3,300 | 3,950 |
| Millwood South | 8,025 | 11,150 | NA | NA |
| Dunwoodie South | 4,025 | 4,025 | 3,775 | 3,800 |

NA: Indicates that the interface is not being monitored in NYISO operations.

Sources: NYISO, 2004 Intermediate Area Transmission Review of the New York State Bulk Power Transmission System (Study Year 2009), March 10, 2005, Table 2.6(A); NYISO Operating Study Summer 2006, Appendix H.

[46] NYISO operates both a day-ahead LMP energy market and a real-time LMP energy market. NYISO uses the terminology ''location-based marginal prices'' or LBMP instead of LMP.

Third, NYISO monitors only open interfaces (except for Total East). The Congestion Study simulations followed NYISO planning documents and modeled both open and closed interfaces.

Finally, historical congestion data referenced in NYISO's 2005 State of the Market Report do not reflect 1000 MW of new generation capacity added in Zone J in 2006. The Congestion Study simulations reflect these and other future capacity additions.

Summary of Comments

NYPSC claimed that Appendix I and Section 12B of the memorandum entitled ''GE–MAPS Input Assumptions: Eastern Interconnect'' (GE–MAPS Assumptions Memo) appear to misrepresent NYISO's 118 percent installed capacity (ICAP) requirement by applying that requirement only to upstate load instead of to State-wide load.

DOE Response

This is a reporting error and the capacity balance for NYISO as a whole provided in the referenced memorandum is incorrect. Nonetheless, ICAP requirements do not explicitly affect system simulations; they affect the timing of the need for new capacity additions. The NYISO system as modeled in the Congestion System is balanced. Thus, this reporting error did not affect the analysis and findings of the Congestion Study.

Summary of Comments

NYPSC commented that Section 7 (Capacity Additions and Retirements) of the GE–MAPS Assumptions Memo employs a $65/kW-year cost for gas turbines, which appears to be very low.

**DOE Response**

The Department agrees that this estimate seems low, especially in light of a recent increase in costs. However, $65/kW-yr was used as a generic carrying charge for new peaking capacity. With $10/kW-yr fixed operating and maintenance cost, this would make the cost of new entry equal to $75/kW-yr (in real 2005 dollars, or $81.2/kW-yr in 2008 dollars). This is only moderately lower than the cost of new entry used in the NYISO ICAP manual for the New York Control Area demand curve for the 2007/2008 capability period ($87.6/kW-yr). Thus, the Department does not believe that increasing the cost of new entry would alter the conclusions in the Congestion Study.

Summary of Comments

NYPSC commented that Section 10 (External Region Supply) in the GE–MAPS Assumptions Memo ''scheduled'' flows from Hydro Quebec to New York, New England, and Ontario on 12 months of historical data that might not be typical.

DOE Response

The Department will work with NYPSC to develop more representative data for use in future congestion studies. However, the Department does not believe that changing these data would alter the conclusions in the Congestion Study.

Summary of Comments

NYPSC commented that Section 12C (Market Model Assumptions—ISO Boundaries) of the GE–MAPS Assumptions Memo cites high hurdle rates between NYISO and ISO New England (ISO–NE)[47] even though wheeling charges between the two areas were eliminated.

DOE Response

The Department recognizes the absence of wheeling charges between NYISO and ISO–NE. The Congestion Study used hurdle rates to reflect other inefficiencies in conducting transactions across market boundaries resulting from differences in market design.

Summary of Comments

NYPSC commented that Section 12D (Market Model Assumptions—Operating Reserves) of the GE–MAPS Assumptions Memo misstates how New York determines operating reserves.

DOE Response

The Congestion Study based operating reserve assumptions on the actual requirements instituted by each reliability region.

Summary of Comments

NJBPU argued that the Congestion Study fails to take into account reliability upgrades that PJM has already required in its existing Regional Transmission Expansion Program (RTEP) process and new upgrades continually being formulated as that process progresses. According to PSEG and PEC, the Department did not take sufficient account of PJM's proposed Reliability Pricing Model (RPM) or the effects of mandatory reliability-driven transmission reinforcements and upgrades, since such upgrades like the Neptune Project would reduce congestion. PSEG asserted that the Congestion Study's claim that ''addition of * * * generation capacity * * * will create additional congestion unless new transmission is also developed'' is erroneous and presumes the siting of remote generation that is far from load and located on the wrong side of the constraint. Additionally, PEC contended that RPM may spur the addition of new generation close to load centers that is not accounted for in the Congestion Study.

DOE Response

The model included planned capacity that is scheduled to come on line over the next several years. In addition, the model assumes that when additional capacity is needed, new capacity will be added at locations that have high locational prices, which are usually close to load. This tends to reduce modeled congestion. The PJM RPM process, if and when it is implemented, should have a similar result.[48] All transmission projects that are far enough along in the siting and construction process to be considered firm in the load flow, including the Neptune Project and any such projects approved in the RTEP process, are included.

PEC questioned why the re-powering of the Potomac River and Benning plants is considered uneconomical.

DOE Response

No assumptions were made in the Congestion Study with regard to these plants.

Summary of Comments

Toll Brothers claimed that the Congestion Study fails to take into account two assumptions that will reduce the need for increased transmission capacity from west to east in the PJM footprint: (1) the likely retirement of some generation facilities between the Midwest and the District of Columbia; and (2) increased restrictions on traditional air pollution emissions from coal-fired plants and the future regulation of greenhouse gas emissions, both of which would increase the cost of electricity generated by such plants. NYPSC asked if modeling accounted for compliance with the Clean Air Interstate Rule.[49]

[47] ISO–NE is the RTO serving Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island.

[48] FERC conditionally approved a settlement on RPM. 117 FERC ¶ 61, 331 (2006), *reh'g pending.* Since the issuance of that order, some parties that had provisionally agreed to support RPM have withdrawn their support.

[49] 70 FR 25,162 (May 12, 2005) (Environmental Protection Agency regulation of sulfur dioxide and nitrogen oxides).

DOE Response

The Congestion Study analysis included only planned retirements. Any attempt to forecast other retirements would be inappropriately speculative. Similarly, in the Eastern analysis, each unit in the model is assumed to comply with all promulgated air regulations, including the Clean Air Interstate Rule, and the Department did not speculate about potential future regulation.

*C. Comments Specific to the Southern California Critical Congestion Area*

Summary of Comments

CPUC argued that the Congestion Study exaggerated the significance of congestion into southern California, relying heavily on simulations instead of historical data and on information from project proponents. CPUC noted that one of the studies provided to DOE concluded, based on physical flow data from 1999 through 2005, that Arizona-to-southern California was not among the areas found to be experiencing heavy path usage. CPUC noted that the year 2008 simulations cited in the Congestion Study as indicating high economic significance of congestion from Arizona into southern Nevada and southern California actually show that the highest simulated congestion costs occur on lines from Arizona into southern Nevada.

DOE Response

The Department's identification of southern California as a Critical Congestion Area was based on a combination of factors, including the existence of historical congestion, projections that this historical congestion will worsen in the absence of remedial measures, as well as the economic and strategic significance of southern California to the Nation as a whole. Thus, while other areas in the Western Interconnection may have experienced higher levels of historical congestion, the Department believes that the totality of circumstances in southern California warrant its identification as a Critical Congestion Area and, as explained further in Section IX below, the draft designation of a National Corridor.

## VIII. Draft Mid-Atlantic Area National Corridor

*A. Alternatives and Recommendations*

In the Congestion Study, the Department solicited alternatives and recommendations for National Corridor designations. The Department received a number of such alternatives and recommendations for the Mid-Atlantic Critical Congestion Area. Some commenters, including EEI and Exelon Corporation, recommended National Corridor designations in eastern New York and eastern PJM, citing the need to remedy the existing and growing congestion problems in the Mid-Atlantic Critical Congestion Area, but they did not specify specific boundaries.[50]

Based on its regional transmission planning studies, PJM recommended three specific National Corridors in the Mid-Atlantic area. According to PJM, a National Corridor is needed in a contiguous area of southeastern Pennsylvania, northern West Virginia, western Maryland, and northern Virginia, because in the absence of construction of a new high-voltage transmission circuit within this area, PJM and North American Electric Reliability Corporation (NERC)[51] reliability planning criteria will be violated by 2011. The other two National Corridors recommended by PJM are: (1) a contiguous area of eastern Ohio, much of Pennsylvania, and part of northern New Jersey; and (2) a contiguous area of eastern Maryland, all of Delaware, and parts of eastern Pennsylvania and southern New Jersey. These two National Corridors are needed, according to PJM, to ensure that planning and development of required transmission solutions can be completed in time to prevent violations of PJM and NERC reliability planning criteria that would otherwise occur by 2014.

AEP recommended a National Corridor to encompass the general anticipated route of a transmission line it is proposing to build between West Virginia and Maryland. Allegheny recommended a National Corridor to encompass the general anticipated route of a transmission line that it and Dominion Virginia Power (Dominion) are proposing to build between southwestern Pennsylvania and northern Virginia.

The Governor of the State of West Virginia commented that development of transmission to supply regions north and east of West Virginia with low-priced clean-coal generation and renewable generation from within, as well as south and west of, his State would result in economic and reliability benefits for all involved regions. Thus, noting the time it can take to site a transmission line and the urgency of addressing the transmission problems, the Governor recommended designation of a National Corridor that would encompass the AEP project as well as the Allegheny-Dominion project.

New York Regional Interconnect Inc. (NYRI) recommended a National Corridor to encompass the general anticipated route of a transmission line it has proposed to build from Marcy, New York to New Windsor, New York.

The City of New York argued that growing energy demand, national security concerns, the unique nature of electricity dependence in the Nation's financial and commercial capital, and fuel diversity and stability factors all warrant the designation of one or more National Corridors for New York City. Specifically, the City of New York recommended a National Corridor between the New Jersey segment of PJM and New York City.[52] The City of New York also recommended a National Corridor north and northwest of New York City within New York State. The City of New York further cited a recently enacted New York State statute that would deny the use of eminent domain powers to NYRI even if its proposed transmission project were to obtain a State permit as illustrative of the type of parochial concerns that may impede needed energy infrastructure improvements and that FPA section 216 was designed to address.

NYISO commented that the Congestion Study correctly included metropolitan New York within the Critical Congestion Area, and correctly identified the general location and direction of congestion in New York. NYISO explained that it conducts a Comprehensive Reliability Planning Process to assess reliability needs and that while its analysis indicates a reliability need for additional resources in southeast New York starting in 2008, sufficient market-based generation solutions have been submitted so that reliability criteria will be met through 2014. Thus, according to NYISO there is no need for a National Corridor from a reliability standpoint. However, NYISO also noted that ''New York's comprehensive and effective generation siting law expired in December 2002 and has not been re-enacted.'' NYISO further noted that while it provides up-to-date data to assist stakeholders in evaluating investments to address the economic effects of congestion, ''by design, the NYISO leaves the decision making on economic solutions for the Market Participants.''

[50] *See also* comments of National Grid, Potomac Holdings, Inc., and HQ Energy Services (US).

[51] NERC is the Electric Reliability Organization responsible for proposing and enforcing reliability standards for the bulk-power system throughout the United States subject to FERC approval under FPA section 215.

[52] *See also* comments of U.S. Rep. Hinchey (Recommending National Corridor between PJM and New York City as an alternative to National Corridor recommended by NYRI).

Numerous commenters recommended against one or more National Corridor designations for the Mid-Atlantic Critical Congestion Area. The Governor of the Commonwealth of Virginia commented that no National Corridor designations should be made before there had been adequate consultation with States.[53] PAPUC commented that while the preliminary data show that there is chronic congestion in some portions of the Mid-Atlantic region that deserves close attention by Federal and State regulators, additional analysis in consultation with States is needed before any National Corridor designation is made.[54] NYPSC and NJBPU opposed National Corridor designations, raising concerns about the data and methodology used in the Congestion Study and arguing that further analysis was needed.[55]

Many commenters recommended against designation of the National Corridor proposed by Allegheny,[56] and many commenters recommended against designation of the National Corridor proposed by NYRI.[57] These commenters raised concerns about the environmental and landowner effects of the particular projects proposed by Allegheny and Dominion and by NYRI and argued for consideration of non-transmission solutions to congestion.[58]

After reviewing the alternatives and recommendations provided, the Department believes that designation of a National Corridor for the Mid-Atlantic Critical Congestion Area may be warranted. In the following sections, the Department will detail its factual finding of the existence of constraints or congestion that adversely affects consumers in the Mid-Atlantic Critical Congestion Area and explain the considerations that it believes warrant designation of a National Corridor for this area. Finally, the Department will delineate and explain the specific boundaries of the draft National Corridor.

*B. Finding of Constraints or Congestion That Adversely Affects Consumers*

The Congestion Study identified the Atlantic coastal area from metropolitan New York southward through northern Virginia as a Critical Congestion Area based on evidence of historical, persistent congestion caused by numerous well-known constraints that are projected to continue and worsen unless addressed through remedial measures. In conducting the Congestion Study, the Department identified these well-known constraints based on a review of extant transmission studies and expansion plans available prior to the publication of the Study. These constraints are listed in Table VIII–1, in no particular order, and their approximate locations are shown in Figures VIII–1 and VIII–2.

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**Table VIII-1. Historical Constraints in PJM and NYISO**

| PJM | NYISO |
|---|---|
| 1. Allegheny Power System to PEPCO and Dominion | 1. Moses South Interface |
| 2. The Western Interface and Central Interfaces of "Classic PJM" | 2. Dysinger East Interface |
| 3. The Eastern Interface of "Classic PJM" | 3. West Central Interface |
| 4. Branchburg Transformer | 4. Central East and Total East Interface |
| 5. PJM to New York City | 5. UPNY-ConEd Interface |
| 6. American Electric Power and First Energy to APS's Transformers | 6. Westchester to New York City |
| 7. Lines connecting ComEd to AEP along Lake Michigan | 7. Westchester to Long Island |
| 8. Homer City Transformer | |
| 9. Erie East - Erie | |
| 10. Kanawha - Mt. Funk | |
| 11. North Carolina to Southern Virginia | |
| 12. Constraints into Delmarva Peninsula | |

Sources: DOE Congestion Study, pp. 22-23; data from PJM and NYISO.

[53] *See* DOE response, Section IV.B. above.

[54] *See* DOE response, Section II.A, II.D, and IV.A above.

[55] *See* DOE response, Sections II.B, II.D, IV.A, VII.A, and VII.B above.

[56] *See, e.g.,* comments of Citizens for Fauquier County, Clarke County Board of Supervisors, Fauquier County Architectural Review Board, Fauquier County Board of Supervisors, Fauquier County Historical Society, Foundation of the State Arboretum, Goose Creek Association, Historic Long Branch, Route 50 Corridor Coalition, Shenandoah Valley Network, Unison Preservation Society, Valley Conservation Council, Sierra Club, Virginia Local and Regional Organizations, Virginia Outdoors Federation, U.S. Rep. Wolf, VA Sen. Herring, Toll Brothers, and many individuals.

[57] *See, e.g.,* comments of ConEd, U.S. Rep. Hinchey, NY Sen. Bonacic, Delaware River Commenters, Upper Delaware Council, CARI, and many individuals.

[58] *See* DOE response, Sections II.B, III, and V above.

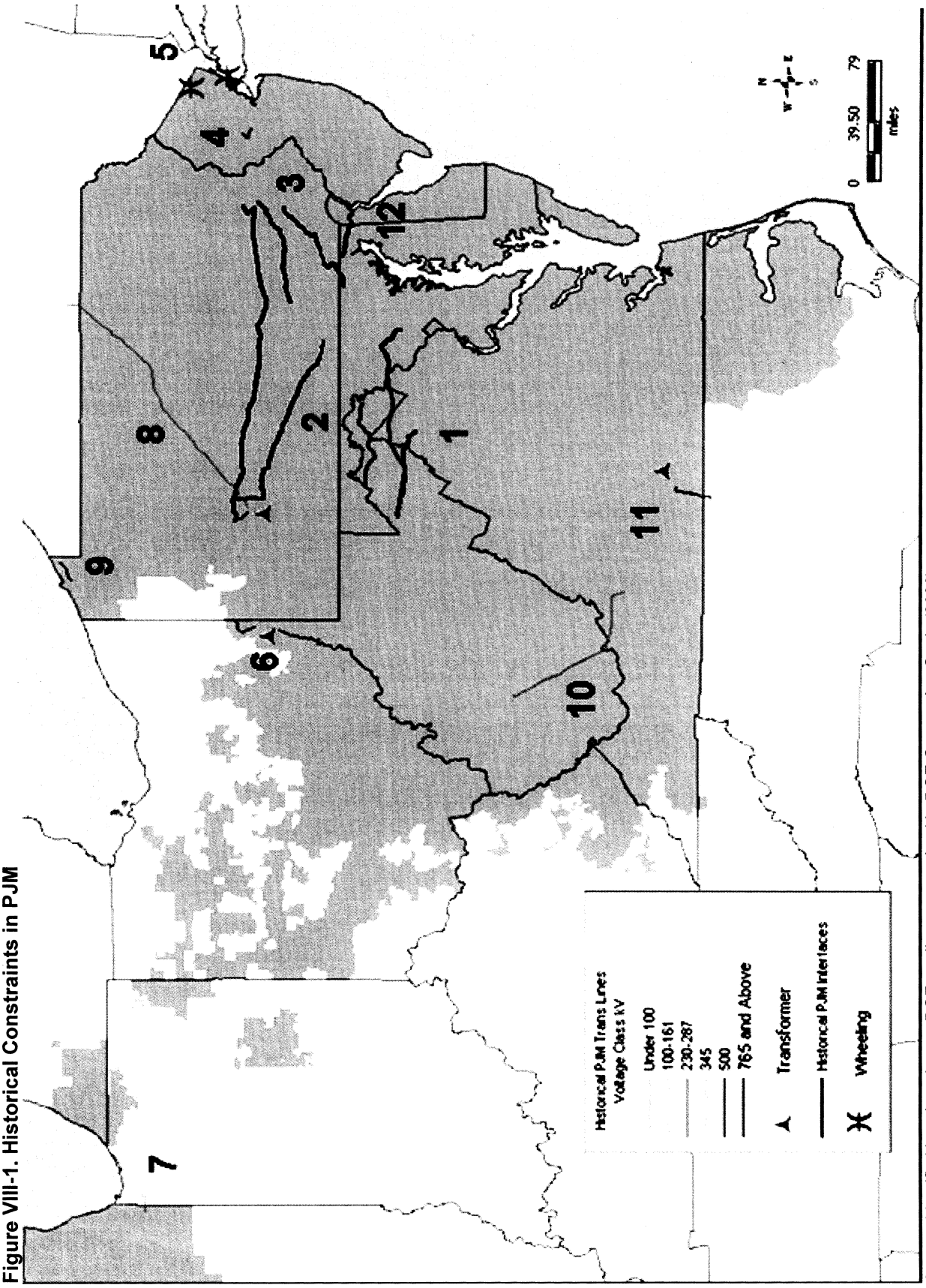


Figure VIII-1. Historical Constraints in PJM

Source: Identified by others in non-DOE studies; summarized in DOE Congestion Study (2006).

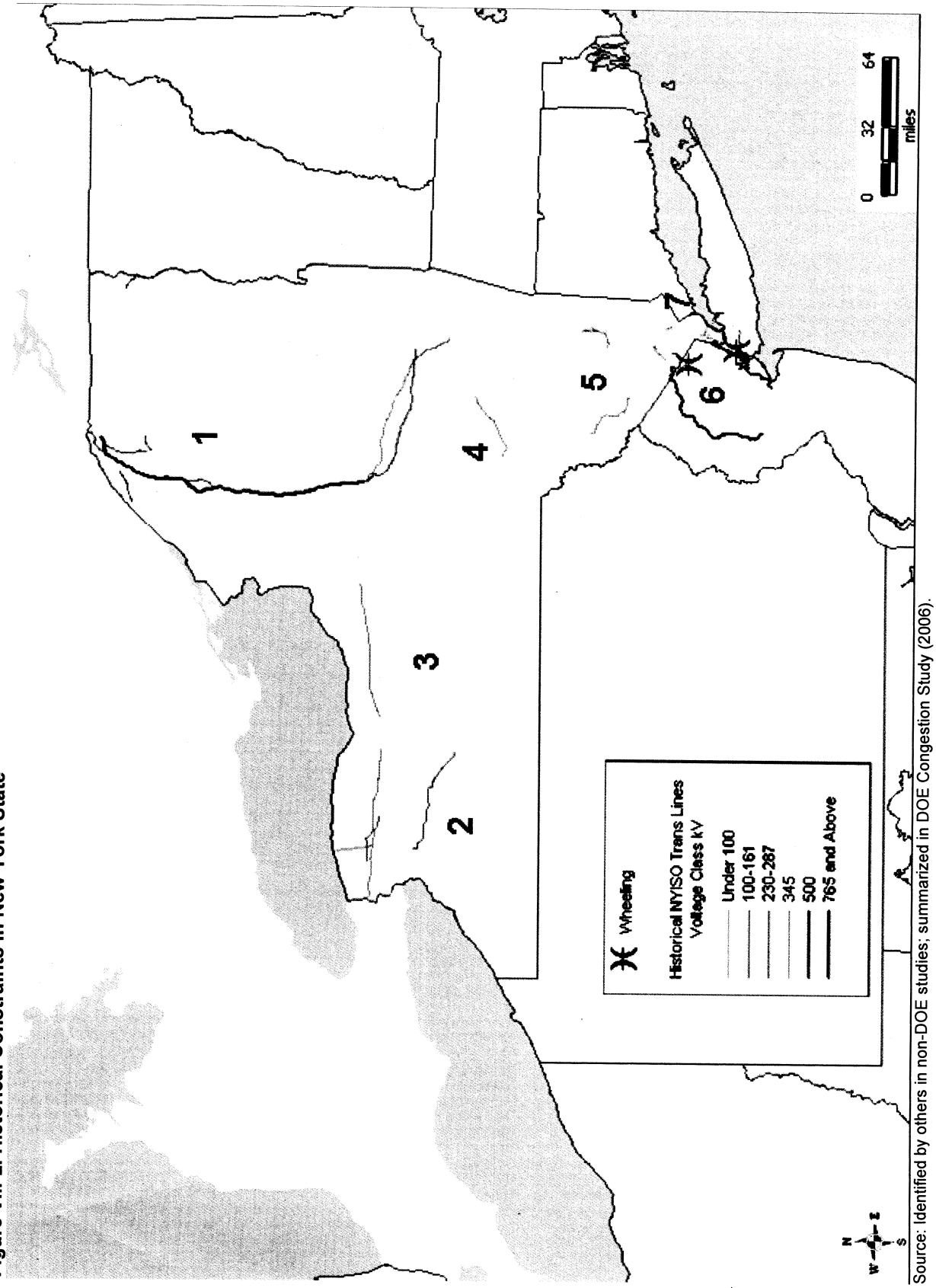


**Figure VIII-2. Historical Constraints in New York State**

Many of these constraints were binding, and thus produced congestion in years 2004, 2005, and 2006. (See Tables VIII–2 and VIII–3 for summaries of hourly data reported by PJM and NYISO.) Further, from 2004 through

2005 in the PJM footprint, a total of 19 constraints were binding more than 5 percent of the time (438 hours/year) in the day-ahead market, and six constraints were binding more than 5 percent of the time in the real-time market.[59] (See Table VIII–4.) In New York over the same period, 18 constraints were binding in the day-ahead market more than 5 percent of the time, and 62 constraints were binding more than 5 percent of the time in the real-time market. (See Table VIII–5.)

[59] Like NYISO, PFM operates both a day-ahead LMP-based energy market and a real-time LMP-based energy market.

**Table VIII-2. Real-Time and Day-Ahead Constrained Hours in PJM, 2004-2006**

| Map ID | Congestion Area | | | Day-Ahead Constraints | | | Real-Time Constraints | | |
|---|---|---|---|---|---|---|---|---|---|
| | Geographic Area | Description of Historically Constrained Elements | Transmission Elements | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 |
| 1 | West VA to VA and MD | From Allegheny Power System (APS) to PEPCO and Dominion | Bedington-Black Oak | 3,348 | 4,564 | 3,921 | 1,376 | 2,017 | 1,907 |
| | | | APS South Interface (Doubs-Mt. Storm 500 KV line and Meadowbrook Mt. Storm 500) | 0 | 441 | 639 | 20 | 45 | 265 |
| 2 | Central PA to Eastern PA | The Western Interface and Central Interfaces of "Classic PJM:" Keystone & Conemaugh - Juniata, Conemaugh - Hunterstown, Doubs - Brighton, Conastone - Peachbottom | Keystone | 241 | 43 | 137 | 57 | 0 | 28 |
| | | | Hunterstown | 20 | 125 | 315 | 20 | 108 | 65 |
| | | | Conemaugh | 0 | 31 | 0 | 0 | 72 | 0 |
| | | | PJM Western Interface | 35 | 586 | 970 | 98 | 371 | 316 |
| 3 | Eastern PA to New Jersey | The Eastern Interface of "Classic PJM:" Wescosville & Juniata-Alburtis, TMI-Hosensack, Peach Bottom - Limerick, Peach Bottom-Keeney) | PJM Eastern Interface | 1,318 | 1,369 | 335 | 315 | 148 | 11 |
| 4 | Branchburg Transformer | Branchburg 230, Branchburg 500, Branchburg-Flagtown 230, Branchburg-Readington | Branchburg-Readington | 0 | 207 | 710 | 137 | 244 | 485 |
| | | | Branchburg-Flagtown 230 | 20 | 37 | 192 | 7 | 29 | 115 |
| | | | Branchburg 500 kV 500-1 | 3,044 | 544 | 48 | 1,123 | 434 | 17 |
| | | | Branchburg 500 kV 500-2 | 82 | 138 | 0 | 108 | 69 | 0 |
| 5 | PJM to New York City | PJM to New York City | Hudson-Farragut | 64 | 80 | 771 | 0 | 0 | 24 |
| 6 | Ohio to West Virginia & PA | American Electric Power (AEP) and First Energy to APS transformers | Wylie Ridge 345/500 X-5 | 616 | 1,182 | 758 | 837 | 628 | 371 |
| | | | Wylie Ridge 345/500 X-7 | 402 | 1,118 | 1,560 | 19 | 1,262 | 777 |
| | | | Sammis-Wylie Ridge 345 | 0 | 5 | 0 | 3 | 63 | 113 |
| | | | Kammer 765/500 Xfm | 190 | 3,414 | 2,047 | 126 | 1,759 | 691 |
| 7 | Illinois to Indiana | Lines connecting ComEd to AEP along Lake Michigan | Crete-St. John 345 B | 1,092 | 790 | 7 | 223 | 26 | 5 |
| | | | Dune Acres-Michigan C | 137 | 23 | 51 | 0 | 58 | 82 |
| | | | State Line-Wolf Lake 1 | 94 | 0 | 955 | 2 | 1 | 428 |
| 8 | Central PA to Central NY | Homer City Transformer | Homer City-Watercure | 626 | 1,833 | 0 | 10 | 29 | 53 |
| | | | Homer City 345/230 Xfm | 91 | 20 | 315 | 52 | 20 | 3 |
| 9 | NW PA to W NY | Erie West to Erie South, Erie E. to Erie SE 230 kV | Erie West, Erie South, Erie East | 14 | 613 | 42 | 2 | 269 | 31 |
| 10 | WV to S. VA | Kanawha - Mt. Funk | Kanawha-Mt. Funk 345 BJF | 0 | 16 | 0 | 36 | 66 | 14 |
| | | | 49305KANAWZ05M FUNK | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | North Carolina to Southern Virginia | Halifax-Person, Clover | Halifax-Person 230 | 0 | 5 | 0 | 0 | 0 | 0 |
| | | | Clover 230/500 Xfm | 0 | 27 | 0 | 0 | 74 | 16 |
| 12 | Eastern PA to Delmarva Peninsula | Keeney, Redlion | Keeney 230 kV | 0 | 4 | 0 | 1 | 5 | 10 |
| | | | Keeney 500 kV | 233 | 76 | 32 | 127 | 30 | 26 |
| | | | Redlion 230 kV | 75 | 209 | 0 | 0 | 3 | 0 |
| | | | Redlion 500 kV | 12 | 0 | 18 | 16 | 0 | 0 |

Notes: PJM provided the total hours binding for each constraint. No assumptions were made about the constraint duration.

Data source: PJM.

**Table VIII-3. Real-Time and Day-Ahead Constrained Hours in NYISO, 2004-2006**

| Map ID | Congestion Area | | | Day-Ahead Constraints | | | Real-Time Constraints | | |
|---|---|---|---|---|---|---|---|---|---|
| | Geographic Area | Description of Historically Constrained Elements | Transmission Elements | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 |
| 1 | Flows from Northern NY | Moses South Interface | Moses South, Massena to Marcy, Moses to Adirondack | 57 | 4 | 72 | 0 | 1 | 0 |
| 2 | Flows into Western NY | Dysinger East Interface | Dysinger East, AES Somerset to Rochester, Niagara to Rochester, Stolle to Meyer | 308 | 470 | 283 | 102 | 136 | 89 |
| | | | West Central | 6 | 34 | 305 | 38 | 21 | 57 |
| | | | Stolle to Meyer | 0 | 0 | 0 | 9 | 0 | 1 |
| 4 | Flows from Western to Eastern NY | Central East and Total East Interface | Hudson-Farragut | 64 | 80 | 771 | 0 | 0 | 24 |
| | | | Leeds-Pleasant Valley | 201 | 534 | 905 | 70 | 130 | 299 |
| | | | CENTRAL EAST | 704 | 938 | 1,823 | 200 | 321 | 594 |
| 5 | Flows into NY Metro Region | UPNY-ConEd Interface | Ladentown to Buchanan South, Pleasant Valley to Wood St., Pleasant Valley to E. Fishkill, Pleasant Valley to Millwood, Roseton to E. Fishkill, Ramapo to Buchanan North | 326 | 73 | 82 | 190 | 91 | 20 |
| 6 | Westchester to NYC | Sprainbrook - Dunwoodie South | Rainey-Dunwoodie | 2,027 | 1,142 | 1,708 | 0 | 0 | 434 |
| | | | W. 49th St. 345 kV | 1,468 | 2,126 | 1,291 | 0 | 0 | 209 |
| | | | Rainey to Vernon 345 kV | 4,124 | 3,111 | 2,786 | 0 | 0 | 104 |
| | | | Sprainbrook - Dunwoodie South | 144 | 2 | 0 | 0 | 673 | 117 |
| 7 | Westchester to Long Island | ConEd-LIPA Interface | HUDAVE E-JAMAICA | 2,417 | 2,432 | 411 | 0 | 0 | 2 |
| | | | Dun-ShoreRd | 5,599 | 6,219 | 7,807 | 5,040 | 5,196 | 4,932 |
| | | | SprainBrook-East Garden City | 167 | 102 | 25 | 122 | 0 | 94 |

Notes: For Day-Ahead, NYISO provided data on an hourly basis; therefore, this analysis assumes each constraint occurrence lasted one hour. For Real-Time, NYISO provided constraint data every 5 minutes on average; therefore, this analysis assumes each occurrence for Real-Time lasted 5 minutes.

Data source: NYISO.

**Table VIII-4. Day-Ahead and Real-Time Constraints in PJM Binding More Than 5% of the Year (438 hours) During 2004-2006**

| Congestion Area | | | Day-Ahead Constraints | | | Real-Time Constraints | | |
|---|---|---|---|---|---|---|---|---|
| Geographic Area | Description of Historically Constrained Elements | Transmission Elements | 2004 Hours | 2005 Hours | 2006 Hours | 2004 Hours | 2005 Hours | 2006 Hours |
| West VA to VA and MD | From Allegheny Power System (APS) to PEPCO and Dominion | Bedington-Black Oak | 3,348 | 4,564 | 3,921 | 1,376 | 2,017 | 1,907 |
| | | APS South Interface (Doubs-Mt. Storm 500 KV line and Meadowbrook Mt. Storm 500) | 0 | 441 | 639 | 20 | 45 | 265 |
| Central PA to Eastern PA | The Western Interface of "Classic PJM" | PJM Western Interface | 35 | 586 | 970 | 98 | 371 | 316 |
| Eastern PA to New Jersey | The Eastern Interface of "Classic PJM": Wescosville & Juniata-Alburtis, TMI-Hosensack, Peach Bottom-Limerick, Peach Bottom-Keeney | PJM Eastern Interface | 1,318 | 1,369 | 335 | 315 | 148 | 11 |
| Branchburg Transformer | Branchburg 230, Branchburg 500, Branchburg-Readington | Branchburg 500 kV 500-1 | 3,044 | 544 | 48 | 1,123 | 434 | 17 |
| | | Branchburg 500 kV 500-2 | 82 | 138 | 0 | 108 | 69 | 0 |
| | | Branchburg-Readington | 0 | 207 | 710 | 137 | 244 | 485 |
| PJM to New York City | PJM to New York City | Hudson-Farragut | 64 | 80 | 771 | 0 | 0 | 24 |
| Ohio to West Virginia & PA | American Electric Power (AEP) and First Energy to APS transformers | Wylie Ridge 345/500 X-5 | 616 | 1,182 | 758 | 837 | 628 | 371 |
| | | Wylie Ridge 345/500 X-7 | 402 | 1,118 | 1,560 | 19 | 1,262 | 777 |
| | | Kammer 765/500 Xfm | 190 | 3,414 | 2,047 | 126 | 1,759 | 691 |
| Illinois to Indiana | Lines connecting ComEd to AEP along Lake Michigan | Crete-St. John 345 B | 1,092 | 790 | 7 | 223 | 26 | 5 |
| | | State Line-Wolf Lake 1 | 94 | 0 | 955 | 2 | 1 | 428 |
| Central PA to Central NY | Homer City-Watercure | Homer City-Watercure | 626 | 1,833 | 0 | 10 | 29 | 53 |
| NW PA to W NY | Erie West to Erie South, Erie E. to Erie SE 230 kV | Erie West, Erie South, Erie East | 14 | 613 | 42 | 2 | 269 | 31 |

Notes: PJM provided the total hours binding for each constraint. No assumptions were made about the constraint duration.

Sources: PJM. Day-Ahead Data: http://www.pjm.com/markets/energy-market/day-ahead.html. Real-Time Data: http://www.pjm.com/markets/energy-market/real-time.html.

**Table VIII-5. Day-Ahead and Real-Time Constraints in NYISO Binding More Than 5% of the Year (438 hours) During 2004-2006**

| Congestion Area | | | Day-Ahead Constraints | | | Real-Time Constraints | | |
|---|---|---|---|---|---|---|---|---|
| Geographic Area | Description of Historically Constrained Elements | Transmission Elements | 2004 Hours | 2005 Hours | 2006 Hours | 2004 Hours | 2005 Hours | 2006 Hours |
| Flows into Western NY | Dysinger East Interface | Dysinger East | 308 | 470 | 283 | 102 | 136 | 89 |
| Flows from Western to Eastern NY | Central East and Total East Interface | Hudson-Farragut | 64 | 80 | 771 | 0 | 0 | 24 |
| | | Leeds-Pleasant Valley | 201 | 534 | 905 | 70 | 130 | 299 |
| | | Central East | 704 | 938 | 1,823 | 200 | 321 | 594 |
| Westchester to NYC | Sprainbrook - Dunwoodie South | Rainey-Dunwoodie | 2,027 | 1,142 | 1,708 | 0 | 0 | 434 |
| | | W. 49th St. 345 kV | 1,468 | 2,126 | 1,291 | 0 | 0 | 209 |
| | | Rainey to Vernon 345 kV | 4,124 | 3,111 | 2,786 | 0 | 0 | 104 |
| | | Sprainbrook - Dunwoodie South | 144 | 2 | 0 | 0 | 673 | 117 |
| Westchester to Long Island | ConEd-LIPA Interface | HudAve E-Jamaica | 2,417 | 2 432 | 411 | 0 | 0 | 2 |
| | | Dun-Shore Rd | 5,599 | 6,219 | 7,807 | 5,040 | 5,196 | 4,932 |

Notes: For Day-Ahead, NYISO provided data on an hourly basis. This analysis assumes each constraint occurrence lasted one hour. For Real Time, NYISO provided constraint data approximately every 5 minutes. If the data showed a congestion cost for a 5-minute segment, the analysis assumed the constraint lasted for 5 minutes.

Source: NYISO, http://www.nyiso.com/public/market_data/power_grid_data.jsp.

The modeling directed by DOE for the Congestion Study projected that some of these constraints will continue to be problems in 2008, along with other additional constraints. DOE found that looking across the several Congestion Study scenarios, 12 constraints were of particular interest in the PJM footprint and 21 in New York. These constraints are listed in Tables VIII–6 and VIII–7 respectively. DOE's analysis indicates that five of the ten most problematic constraints in the Eastern Interconnection are in New York, and the other five are in the PJM footprint.

**Table VIII-6. Top Constraints in PJM Based on DOE Congestion Study Projections for 2008**

| Constraint Name |
|---|
| APS South Interface |
| INTERFACE= PJM - WESTERN |
| 148 - Cloverdale-Lexington 5 |
| 1-TRIPS,8MT STM -01PRNTY - 1 |
| 461 - Mt. Storm-Doubs 500 |
| INTERFACE= PJM - CENTRAL |
| 1130 - Wylie Ridge 345/500 X |
| 1530 - Elrama-Mitchell 138 |
| 78 - Black Oak-Bedington 500 |
| 1386 - Oglesby-Mazon 138 |
| RAMAPO 1000MW WHEEL |
| NFG 23 - Roseland-Cedar Grove |
| 130 - Cedar Grove-Clifton 23 |

**Table VIII-7. Top Constraints in NYISO Based on DOE Congestion Study Projections for 2008**

| Constraint Name |
|---|
| 7 I/F MOSES SOUTH CLOSE HI |
| 11 I/F UPNY - SENY CLOSE LO |
| 14 I/F WEST CENTRAL OP LO |
| 1TRIP Dun-ShoreRd SpBrk-EGC |
| 1TRIP Leeds-Pleasant Val HI |
| 1TRIP Reynld-GBush NScot-Alp |
| 1-TRIPS,HMP HRBR-DVNPT NK- 1 |
| 1TSPBKTRMT:DUN NO2R-S CREEK |
| 7 I/F CENTRAL EAST LO |
| Actual:DUN SO1R-E179 ST |
| Actual:E179 ST-HG 6 |
| Actual:FR-KILLS-WILOWBK2 |
| Actual:GOWNUS1R-GRENWOOD |
| Actual:GRENWOOD-VERNON-E |
| Actual:HUDAVE E-JAMAICA |
| Actual:V STRM P-JAMAICA |
| CP10_12_1-tips, ReacBus-Dvnp |
| CP10_20_E179St_Hg4_E179St_Hg |
| FARRGUT 1000MW WHEEL |
| NFG7010 - IMO - ADIRONDACK |
| NFG7105 - ADIRONDACK - IMO |
| ONTARIO-NEW YORK ST LAW INT |

The existence of constraints causing persistent congestion is further evidenced by regional differences in generation capacity factors within the PJM and NYISO footprints. In a regional-scale electricity market, generators producing electricity at lower costs will typically be used at higher capacity factors than generators with higher production costs, except when such efficient use of resources is not feasible due to transmission limitations and the need to operate some generation capacity close to load centers to ensure voltage stability in those areas.[60] Accordingly, the Department undertook an analysis to identify areas within or near the PJM footprint and New York State with underutilized lower cost generation, and to identify the constraints that limit flows of lower-priced electricity from generation-rich areas to generation-short areas with higher prices.

PJM data for 2004, 2005, and 2006 show that the utilization rate (or capacity factor) for large generators (>200MW) in the $30–40/MWh cost category in the western portion of PJM's footprint was 63, 61, and 67 percent on average respectively (Table VIII–8); DOE projections show a slightly higher figure for 2008 (also Table VIII–8). By comparison, the average capacity factor for generation in the same cost class in the eastern portion of PJM's footprint was 74, 79, and 77 percent in 2004, 2005, and 2006 respectively and is projected by DOE at over 79 percent for 2008. (See Table VIII–9.) In DOE's projections for 2008, similar differentials in capacity factor are seen between the western and eastern portions of PJM's footprint for higher cost groups of generators (i.e., $40–50/MWh, $50–60/MWh, $60–80/MWh, and $80–90/MWh). The western portion of PJM's footprint has no operating units above $100/MWh; the eastern portion does, and they are used when needed. (See Figure VIII–3.)

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[60] Regulations governing the mix of generation supplied by load-serving entities to consumers, such as State renewable portfolio standards, could also affect the capacity factors for higher cost generation, but do not appear relevant here.

**Table VIII-8. Capacity Factors for Large Generators in Western PJM (>200 MW) in $30-40/MWh Cost Class, 2004-2006, and Projected by DOE for 2008**

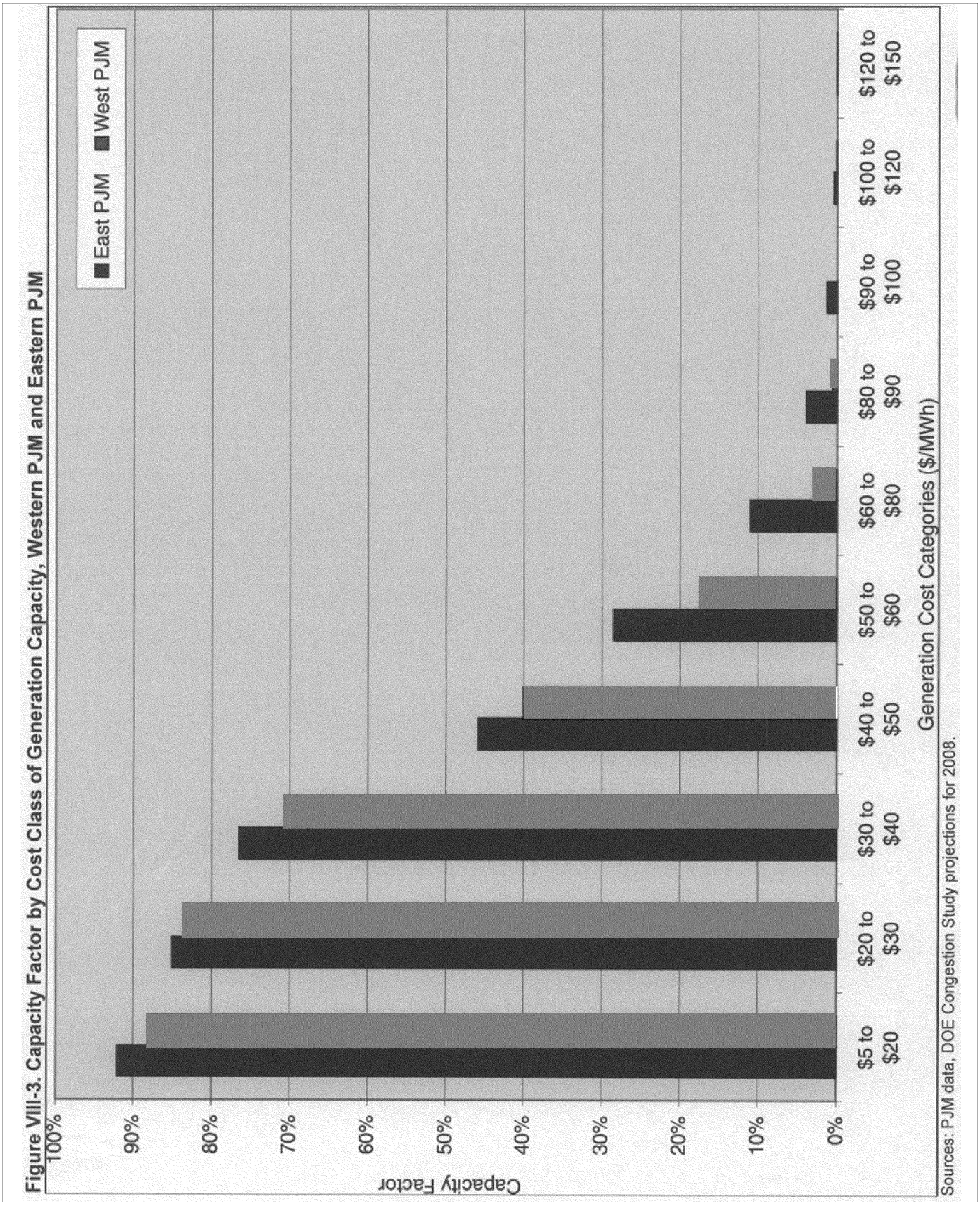
| Plant | Zone | Capacity (MW) | Actual Capacity Factor, 2004 | Actual Capacity Factor, 2005 | Actual Capacity Factor, 2006 | Simulated Capacity Factor, 2008 |
|---|---|---|---|---|---|---|
| Armstrong | APS | 343 | 69% | 67% | 61% | 57% |
| Cardinal | AEP | 1,800 | 68% | 71% | 69% | 77% |
| Conesville | AEP | 1,695 | 53% | 44% | 66% | 70% |
| Hatfield's Ferry | AEP | 1,466 | 60% | 62% | 69% | 70% |
| J M Stuart | DAY | 2,340 | 71% | 70% | 74% | 68% |
| Kanawha River | AEP | 390 | 58% | 61% | 62% | 63% |
| Muskingum River | AEP | 790 | 62% | 56% | 59% | 58% |
| Willow Island | APS | 235 | 29% | 29% | 34% | 39% |
| **Subtotal** | **PJM West** | **9,059** | **63%** | **61%** | **67%** | **68%** |

Sources: PJM data; 2008 projections for DOE Congestion Study.

**Table VIII-9. Capacity Factors for Large Generators in Eastern PJM (>200 MW) in $30-40/MWh Cost Class, 2004-2006, and Projected by DOE for 2008**

| Plant | Zone | Capacity (MW) | Actual Capacity Factor, 2004 | Actual Capacity Factor, 2005 | Actual Capacity Factor, 2006 | Simulated Capacity Factor, 2008 |
|---|---|---|---|---|---|---|
| Brandon | BGE | 1,300 | 75% | 75% | 81% | 77% |
| Chalk Point | PEPCO | 683 | 71% | 67% | 62% | 75% |
| Chesterfield | DOM | 1,250 | 66% | 75% | 73% | 73% |
| Dickerson | PEPCO | 546 | 69% | 70% | 64% | 78% |
| Keystone | PENELEC | 1,700 | 83% | 91% | 82% | 80% |
| Montour | PPL | 1,495 | 75% | 85% | 87% | 85% |
| Wagner | BGE | 324 | 64% | 78% | 59% | 84% |
| **Subtotal** | **PJM East** | **7,298** | **74%** | **79%** | **77%** | **79%** |

Sources: PJM data; 2008 projections for DOE Congestion Study.




These historical data and projections confirm that there are differences in capacity factors between the eastern and western portions of PJM's footprint, and that the eastern portion consistently relies on a more-expensive-to-run mix of

generation sources than the western portion. This is a direct result of transmission constraints that prevent lower-priced electricity from the western portion of the PJM footprint from reaching load centers in the eastern portion during the hours the constraints are binding.

DOE also examined the data from its projections for 2008 to identify the transmission constraints that most limited flows from the western portion of PJM's footprint (and from the eastern portion of the Midwest ISO's footprint) to serve loads in the eastern portion of PJM's footprint. The constrained facilities are listed in Table VIII–10, and the approximate locations of those constraints are shown in Figure VIII–4.

**Table VIII-10. Transmission Constraints Limiting the Ability To Use Generation in West PJM and East MISO To Serve PJM Loads in 2008**

| ISO | Constraint Number | Constraint | Constraint Type | Class | Congestion | Symbol in Map |
|---|---|---|---|---|---|---|
| PJM | 1 | 147 - Cloverdale-Lexington 5 | Line | Source & Sink | | — |
| PJM | 2 | 178 - Crete-E. Frankfort 345 | Line | Source | | — |
| PJM | 3 | 97 - Benton Harbor-Palisades | Line | Source | | — |
| PJM | 4 | 1-TRIPS,8MT STM -01 PRNTY - 1 | Line | Source & Sink | Top Constraint | — |
| PJM | 5 | 78 - Black Oak-Bedington 500 | Line | Source & Sink | Top Constraint | — |
| PJM | 6 | 180- Crete-St. John 345 B | Line | Source | | — |
| PJM | 7 | 314 - Homer City-Shelocta 23 | Line | Source & Sink | | — |
| PJM | 8 | 636O1SOCIALBLAIRSVL | Line | Source & Sink | | — |
| PJM | 9 | FG 1713 DICKERSN-PL VIEW 230 | Line | Source & Sink | | — |
| PJM | 10 | 460- Mt. Storm-Doubs 500 | Line | Source & Sink | | — |
| PJM | 11 | 650 - Seneca-Maple 138 | Line | Source & Sink | | — |
| PJM | 12 | 188 - Danvilie-East Danville | Line | Sink | | — |
| PJM | 13 | 1-TRIP EDISON-MDWRD PBRG-TRN | Line | Sink | | — |
| PJM | 14 | 299- Halifax-Person 230 | Line | Sink | | — |
| PJM | 15 | 70- Branchburg-Flagtown 230 | Line | Sink | | — |
| PJM | 16 | 751 - Warren-Falconer 115 | Line | Sink | | — |
| PJM | 17 | Croyden-Burlington | Line | Sink | | — |
| PJM | 18 | Mickleton-Delco Tap | Line | Sink | | — |
| PJM | 19 | N PHILADELPH WANEETA ACTUAL | Line | Sink | | — |
| PJM | 20 | 130- Cedar Grove-Clifton 23 | Line | Sink | Top Constraint | — |
| PJM | 21 | Juniata-Lewiston | Line | Sink | | — |
| PJM | 22 | NFG 23 - Roseland-Cedar Gro | Line | Sink | Top Constraint | — |
| PJM | 23 | 50- Axton 765/138 Xfm | Transformer | Source & Sink | | ⅄ |
| PJM | 24 | 1-TRIPS,08SGROVE-08SGROVE- 1 | Transformer | Source | | ⅄ |
| PJM | 25 | 1130- Wylie Ridge 345/500 X | Transformer | Source & Sink | Top Constraint | ⅄ |
| PJM | 26 | 317 - Homer City 345/230 Xfm | Transformer | Sink | | ⅄ |
| PJM | 27 | 690 - St. Clair 345/230 Xfm | Transformer | Sink | | ⅄ |
| PJM | 28 | 750- Waldwick-Hawthome 230 | Transformer | Sink | | ⅄ |
| PJM | 29 | 1228 - Clover 230/500 Xfm | Transformer | Sink | | ⅄ |
| PJM | 30 | APS South Interface | Interface | Source & Sink | Top Constraint | —— |
| PJM | 31 | INTERFACE= PJM - CENTRAL | Interface | Source & Sink | Top Constraint | —— |
| PJM | 32 | INTERFACE= PJM - EASTERN | Interface | Source & Sink | | —— |
| PJM | 33 | INTERFACE= PJM - WESTERN | Interface | Source & Sink | Top Constraint | —— |
| PJM / NYISO | 34 | FARRGUT 1000MW WHEEL | Wheeling | Source & Sink | | ⋓ |
| PJM / NYI5O | 35 | RAMAPO 1000MW WHEEL | Wheeling | Source & Sink | Top Constraint | ⋓ |

Source: DOE Congestion Study Projections for 2008.

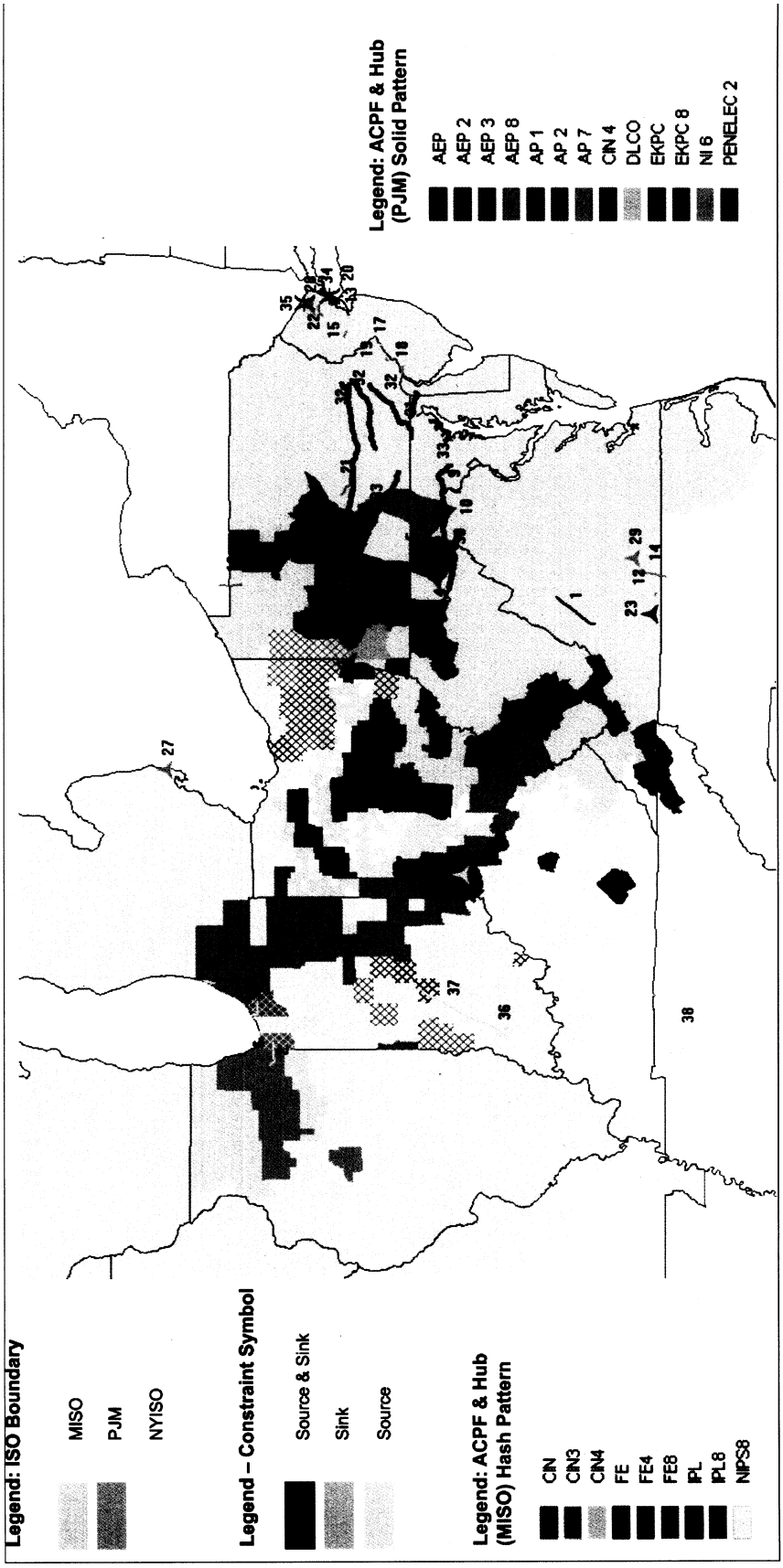



Figure VIII-4. Areas with Available Lower-Cost Generation in PJM and MISO and Transmission Constraints Limiting Electricity Transfers to Eastern PJM Load Centers

A somewhat similar situation exists in New York State. For purposes of this analysis, DOE divided the State into three geographic areas: Upstate West (NYISO zones A through E), Upstate East (NYISO Zones F through I), and

Downstate (NYISO Zones J and K). (See Figure VIII–5.) Downstate has almost no thermal capacity below $60/MW, whereas Upstate West has about 5750 MW and Upstate East has about 2600 MW at $60/MW or lower. (See Figure VIII–6.) In DOE's projections for 2008, however, the below-$60/MW thermal units are shown as operating at very high capacity factors already. (See Figure VIII–7.) The effects of transmission congestion start to become apparent in the $60–70/MW class, where lower-cost capacity in Upstate East is available but its output is not always deliverable to Downstate. Downstate has more than 14,250 MW of capacity with production costs of $70/MW or higher (up to more than $200/MW), whereas Upstate East and Upstate West combined have only about 5100 MW at $70/MW or higher. Further, according to both historical data and DOE's projections for 2008, the units in Downstate in all classes with production costs above $70/MW almost always operate at higher capacity factors than in the other two areas. (See Table VIII–11.)

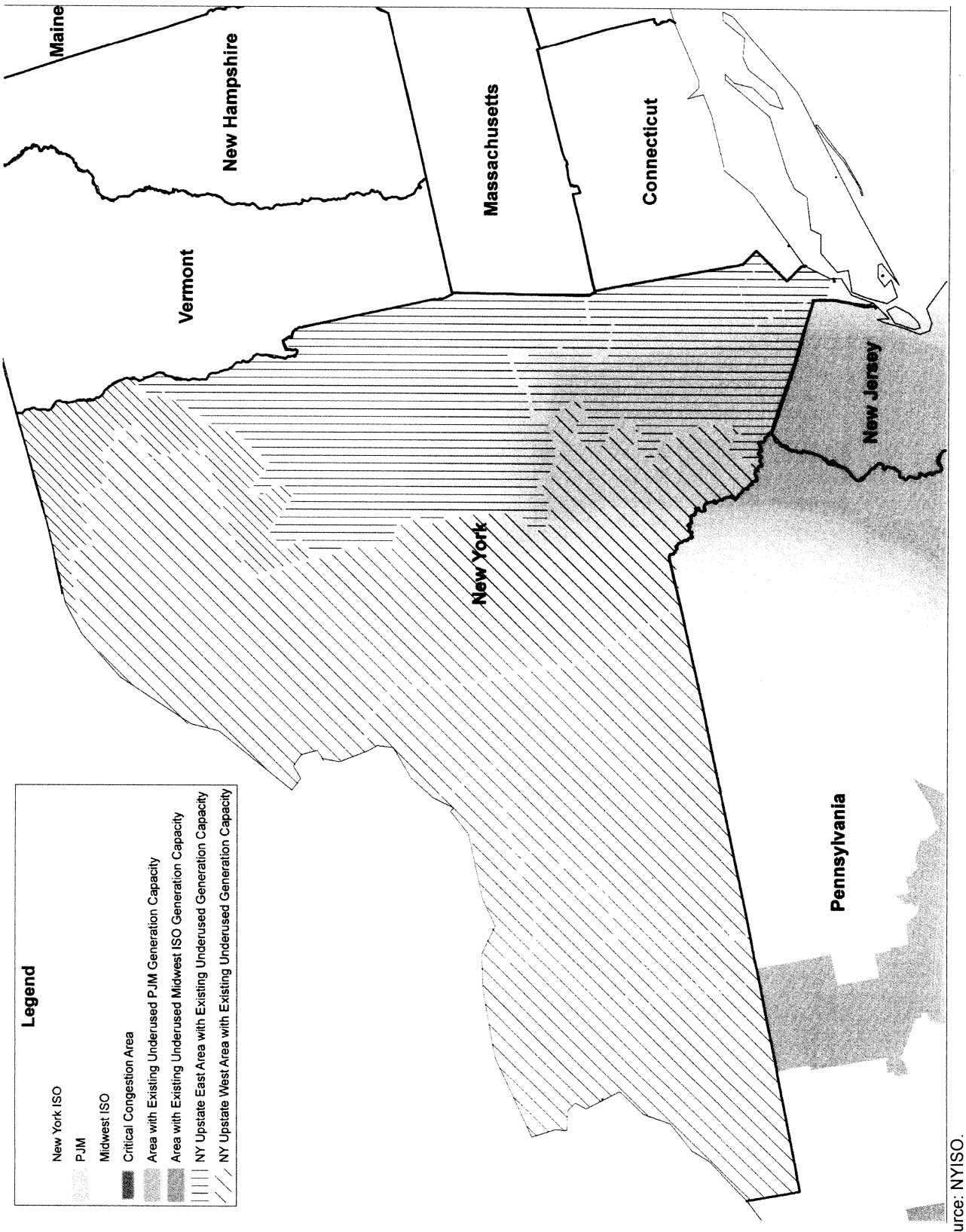
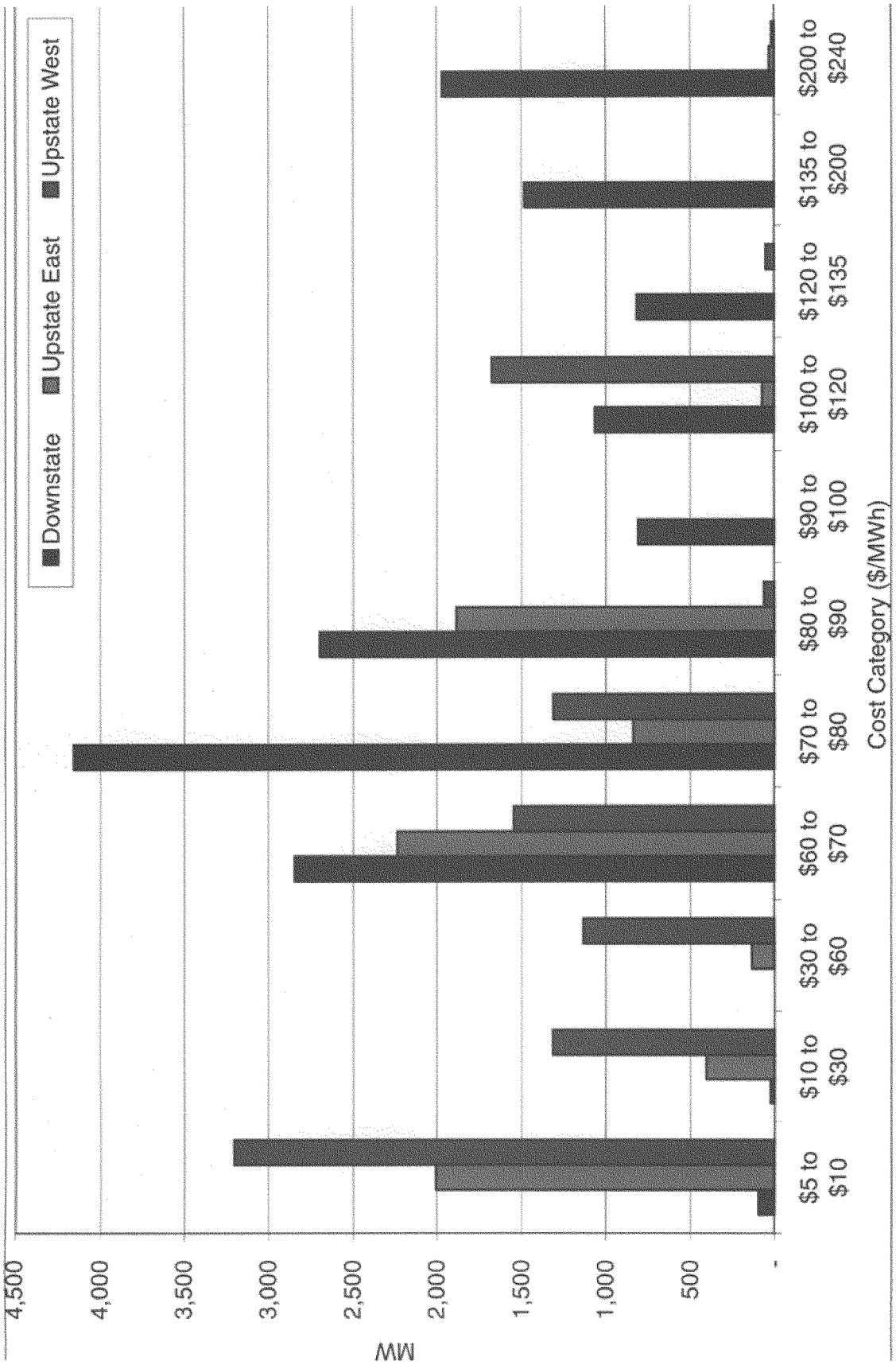



Figure VIII-5. Areas in New York with Available Lower-Cost Generation

Data source: NYISO.

**Figure VIII-6. New York State Installed Thermal Capacity by Region and by Production Cost Class**




Source: Input data for DOE Congestion Study, 2008 base case.

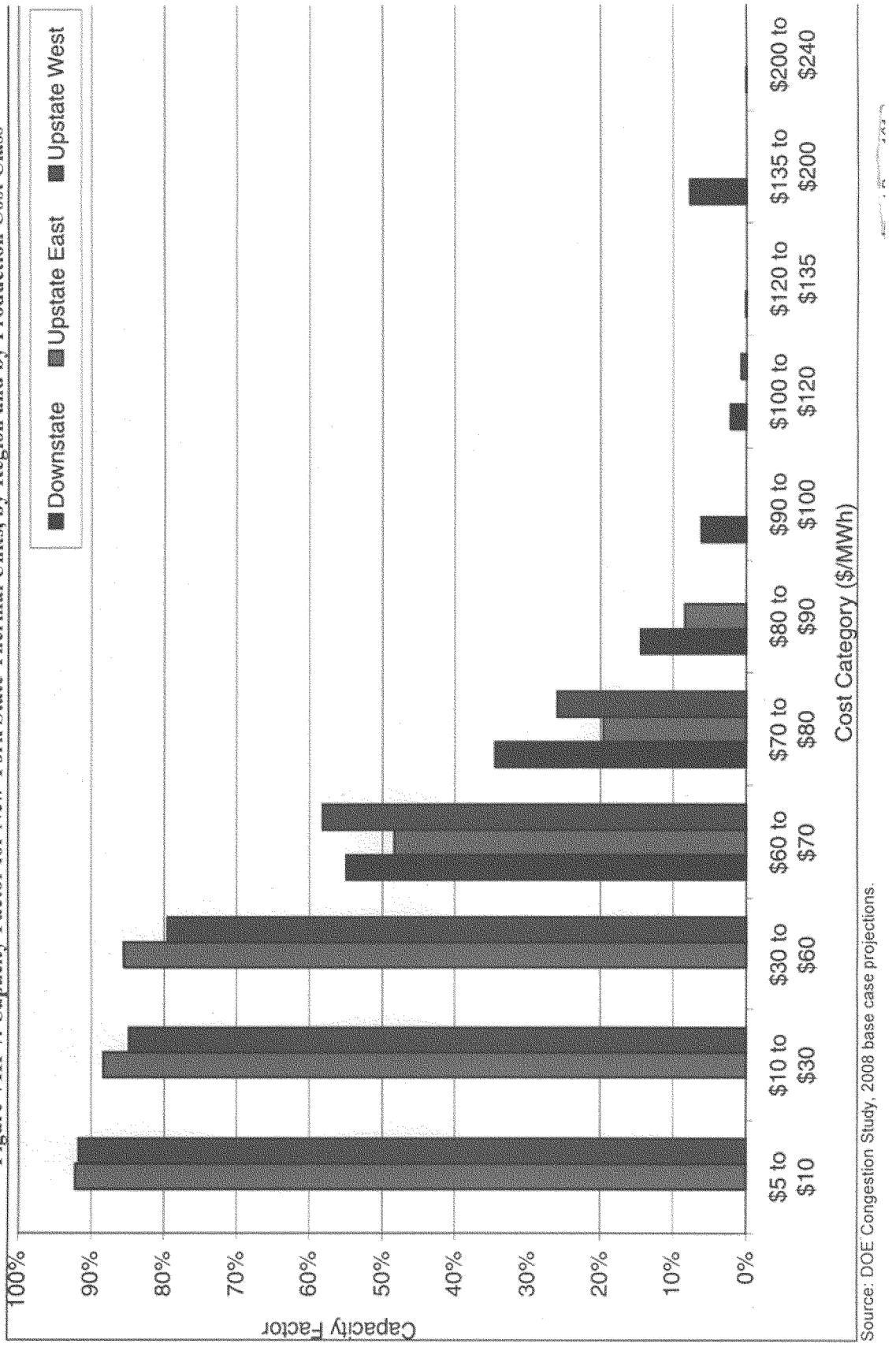


Figure VIII-7. Capacity Factor for New York State Thermal Units, by Region and by Production Cost Class
Downstate
Upstate East
Upstate West
Capacity Factor
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
$5 to $10
$10 to $30
$30 to $60
$60 to $70
$70 to $80
$80 to $90
$90 to $100
$100 to $120
$120 to $135
$135 to $200
$200 to $240
Cost Category ($/MWh)
Source: DOE Congestion Study, 2008 base case projections.

**Table VIII-11. Historical and Projected Capacity Factors for New York Power Plants, by Location and Cost per Megawatt**

| Cost Category ($/MW) | Capacity Factor (Percent) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Downstate Plants | | | Upstate East Plants | | | Upstate West Plants | | |
| | 2004 | 2005 | 2008 Simulated | 2004 | 2005 | 2008 Simulated | 2004 | 2005 | 2008 Simulated |
| $60-70 | 60 | 60 | 55 | 19 | 21 | 48 | 32 | 43 | 58 |
| $70-80 | 28 | 30 | 34 | 18 | 16 | 20 | 32 | 29 | 26 |
| $80-90 | 29 | 36 | 14 | 23 | 22 | 8 | 0 | 0 | 0 |
| $100-120 | 21 | 17 | 6 | 0 | 0 | 0 | 3 | 7 | 0 |
| $120-135 | 3 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| $135-200 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sources: Historical data from NYISO; projections for 2008 from DOE Congestion Study.

DOE reviewed both historical data and its projections for 2008 to identify the constraints that appear most critical in limiting the use of generation in upstate New York, Ontario, and Pennsylvania to serve downstate New York loads. The constraints thus identified are listed in Table VIII–12, and their approximate locations are shown in Figures VIII–8A and VIII–8B.

**Table VIII-12. Transmission Constraints Limiting the Ability To Use Generation in Upstate NYISO and Ontario to Serve NYISO Loads**

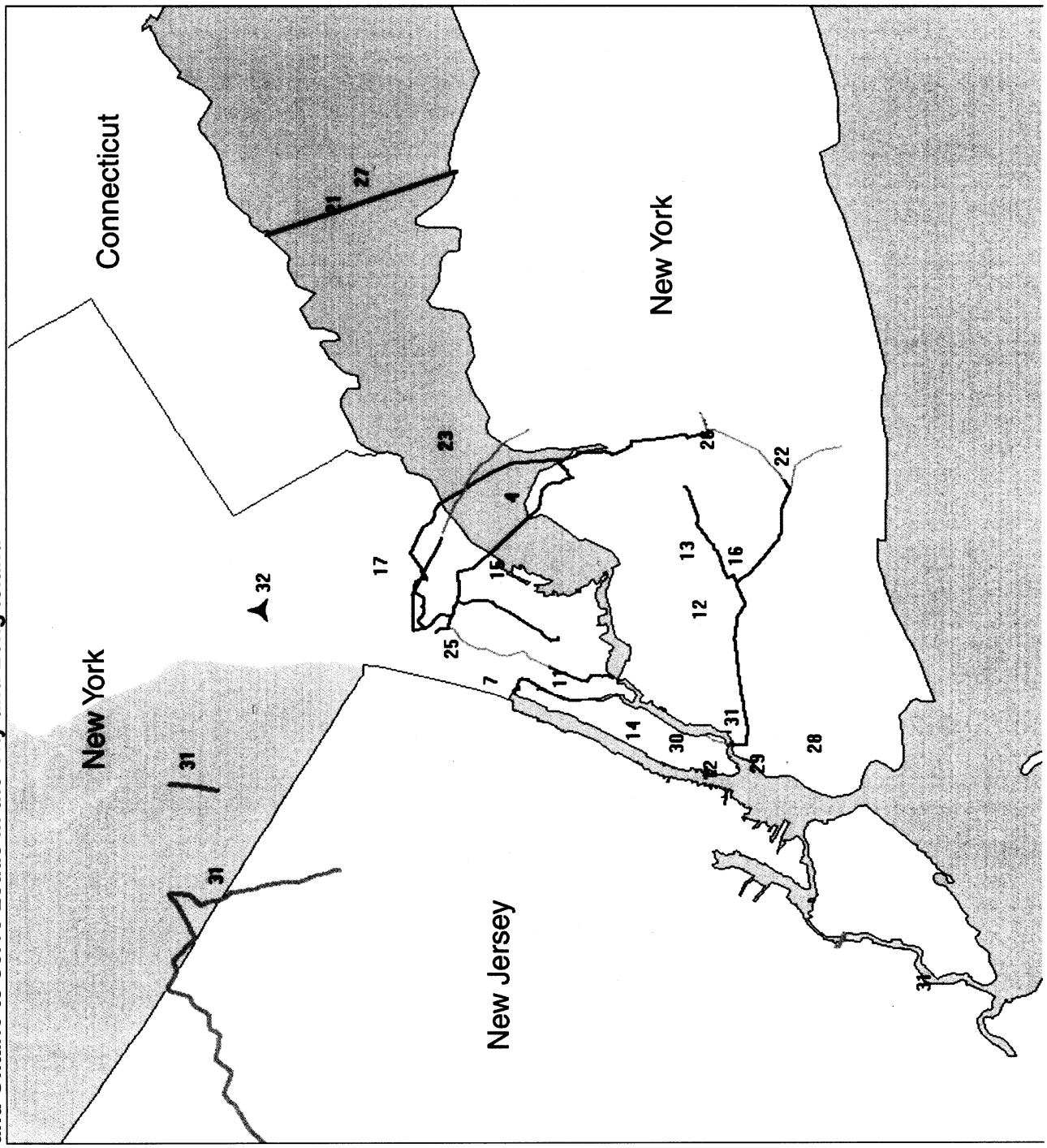
| ISO | Constraint Number | Flowgate Name | Constraint Type | Class | Congestion | Symbol in Map |
|---|---|---|---|---|---|---|
| NYISO | 1 | 111/F UPNY - SENY OPEN LO | Interface | Source & Sink | Top Constraint | —— |
| NYISO | 2 | 14 I/F WEST CENTRAL OP HI | Interface | Source & Sink | Top Constraint | —— |
| NYISO / IMO | 3 | 1454 - IMO-NYIS | Interface | Source & Sink | | —— |
| NYISO | 4 | 1TRIP Dun-ShoreRd SpBrk-EGC | Line | Source & Sink | Top Constraint | — |
| NYISO | 5 | 1TRIP Leeds-Pleasant Val HI | Line | Source & Sink | Top Constraint | — |
| NYISO | 6 | 1-TRIPSSCRIBA -VOLNEY - 1 | Line | Source & Sink | | — |
| NYISO | 7 | 1TSPBKTRMT:DUN SOI R-E179 ST | Line | Source & Sink | | — |
| NYISO | 8 | 7 I/F CENTRAL EAST LO | Interface | Source & Sink | Top Constraint | —— |
| NYISO | 9 | 7 I/F MOSES SOUTH OPEN HI | Interface | Source & Sink | Top Constraint | —— |
| NYISO | 10 | 8 I/F DYSINGER-EAST OPEN LO | Interface | Source & Sink | | —— |
| NYISO | 11 | Actual:E179 ST-HG 6 | Line | Source & Sink | Top Constraint | — |
| NYISO | 12 | Actual:HUDAVE E-JAMAICA | Line | Source & Sink | Top Constraint | — |
| NYISO | 13 | Actual:L SUCSPH-JAMAICA | Line | Source & Sink | | — |
| NYISO | 14 | Actual:RAINEY8W-VERNON-W | Line | Source & Sink | | — |
| NYISO | 15 | Actual:SPRBROOK-TREMONT | Line | Source & Sink | | — |
| NYISO | 16 | Actual:V STRM P-JAMAICA | Line | Source & Sink | Top Constraint | — |
| NYISO | 17 | CP1O_12_1-tips, ReacBus-Dvnp | Line | Source & Sink | Top Constraint | — |
| NYISO | 18 | CP1O_20_E1 79St.Hg4_E179StHg | Line | Source & Sink | Top Constraint | — |
| NYISO / IMO | 19 | NFG7O1O - IMO- ADIRONDACK | Line | Source & Sink | Top Constraint | — |
| NYISO / IMO | 20 | NFG71O5 - ADIRONDACK - IMO | Line | Source & Sink | Top Constraint | — |
| NYISO | 21 | NORHR138 138-NRTHPT P 138- 1 | Line | Source & Sink | | — |
| NYISO | 22 | BARRET VALLEY STREAM ACTUAL | Line | Sink | | — |
| NYISO | 23 | 1-TRIPS,HMP HRBR-DVNPT NK- 1 | Line | Sink | Top Constraint | — |
| NYISO | 24 | 1-TRIPS,SHORE RD-L SUCS -1 | Line | Sink | | — |
| NYISO | 25 | Actual:DUN SO1R-E179 ST | Line | Sink | Top Constraint | — |
| NYISO | 26 | VALLEY STRM - E GARDEN CTY | Line | Sink | | — |
| NYISO / ISONE | 27 | NFG9155 - NYIS-ISONE | Interface | Sink | | —— |
| NYISO | 28 | 1TGOWNGOTN:GOWANUSS-GOTHLS S | Line | Sink | | — |
| NYISO | 29 | 1TGOWSGOTS:GOWANUSN-GOTHLS N | Line | Sink | | — |
| NYISO | 30 | 1-TRIPS,E15ST 46-FARRAGUT- 1 | Line | Sink | | — |
| NYISO | 31 | 16 I/F TOTAL EAST LO | Interface | Sink | | —— |
| NYISO | 32 | 1-TRIPS,E VIEW1 -EASTVIEW- 1 | Transformer | Source & Sink | | ⅄ |
| NYISO / PJM | 33 | FARRGUT 1000MW WHEEL | Wheeling | Source & Sink | Top Constraint | ⋊ |
| NYISO / PJM | 34 | RAMAPO 1000MW WHEEL | Wheeling | Source & Sink | | ⋊ |

Sources: NYISO data; DOE Congestion Study Projections for 2008.

**Figure VIII-8A. Transmission Constraints Limiting the Ability to Use Generation in Upstate New York and Ontario to Serve Downstate New York Loads**


Source: DOE Congestion Study, 2008 base case projections.

**Figure VIII-8B. Transmission Constraints in New York City Area Limiting the Ability to Use Generation in Upstate New York and Ontario to Serve Loads in the City and Long Island**




Source: DOE Congestion Study, 2008 base case projections.

Further, PJM notes in its comments that total congestion costs in its growing footprint rose from $65 million in 1999 to more than $2.09 billion in 2005.[61] (See Table VIII–13.) These figures are similar to the results from the Department's modeling for 2008, which show that the top constraints in this region account for $1.57 billion (20 percent) of the $8 billion of total congestion rent for the entire Eastern Interconnection. The Department's projections for 2008 show that the top constraints in New York account for $0.98 billion (12 percent) of the $8 billion of total congestion rent for the entire Eastern Interconnection. As discussed in Section VII.A.2 above, while financial transmission rights protect load-serving entities in PJM and NYISO from paying congestion costs or congestion rents, congestion costs and congestion rents are nonetheless useful indicators of the persistence and pervasiveness of congestion within a transmission system.

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**Table VIII-13. Total Annual PJM Congestion Costs, 1999-2005 (Million Dollars)**

| | Congestion Charges | Percent Increase Over Previous Year | Total PJM Billing | Percent of PJM Billing |
|---|---|---|---|---|
| 1999 | $65 | NA | NA | NA |
| 2000 | 132 | 103 | $2,300 | 6 |
| 2001 | 271 | 106 | 3,400 | 8 |
| 2002 | 453 | 67 | 4,700 | 10 |
| 2003 | 464 | 2 | 6,900 | 7 |
| 2004 | 750 | 62 | 8,700 | 9 |
| 2005 | 2,092 | 179 | 22,630 | 9 |
| **Total** | **$4,163** | | **$48,630** | **9** |

Source: PJM State of the Market Report, 2005.

Thus, the Department has documented the existence of persistent congestion into and within the Mid-Atlantic Critical Congestion Area, as well as the constraints causing that persistent congestion. As discussed in Section II.A above, whenever there is persistent congestion, buyers must rely on power from less-preferred generating sources, a smaller range of generators is able to serve load, and grid operators have fewer options for dealing with adverse circumstances or unanticipated events, all of which adversely affects consumers. Therefore, the Department finds under FPA section 216(a)(2) that there are ''constraints or congestion that adversely affects consumers'' in the Mid-Atlantic Critical Congestion Area.

*C. Determination That Designation of a Mid-Atlantic Area National Corridor Would Be Warranted*

Given the presence of constraints or congestion that adversely affects consumers in the Mid-Atlantic Critical Congestion Area, the Secretary has the discretion to consider designation of a National Corridor. As discussed above in Section II.A, the Secretary will determine whether to exercise his discretion based on the totality of the information developed, taking into account relevant considerations, including the considerations identified in FPA section 216(a)(4), as appropriate. In this section, the Department discusses the considerations that it believes warrant designation of the Mid-Atlantic Area National Corridor.

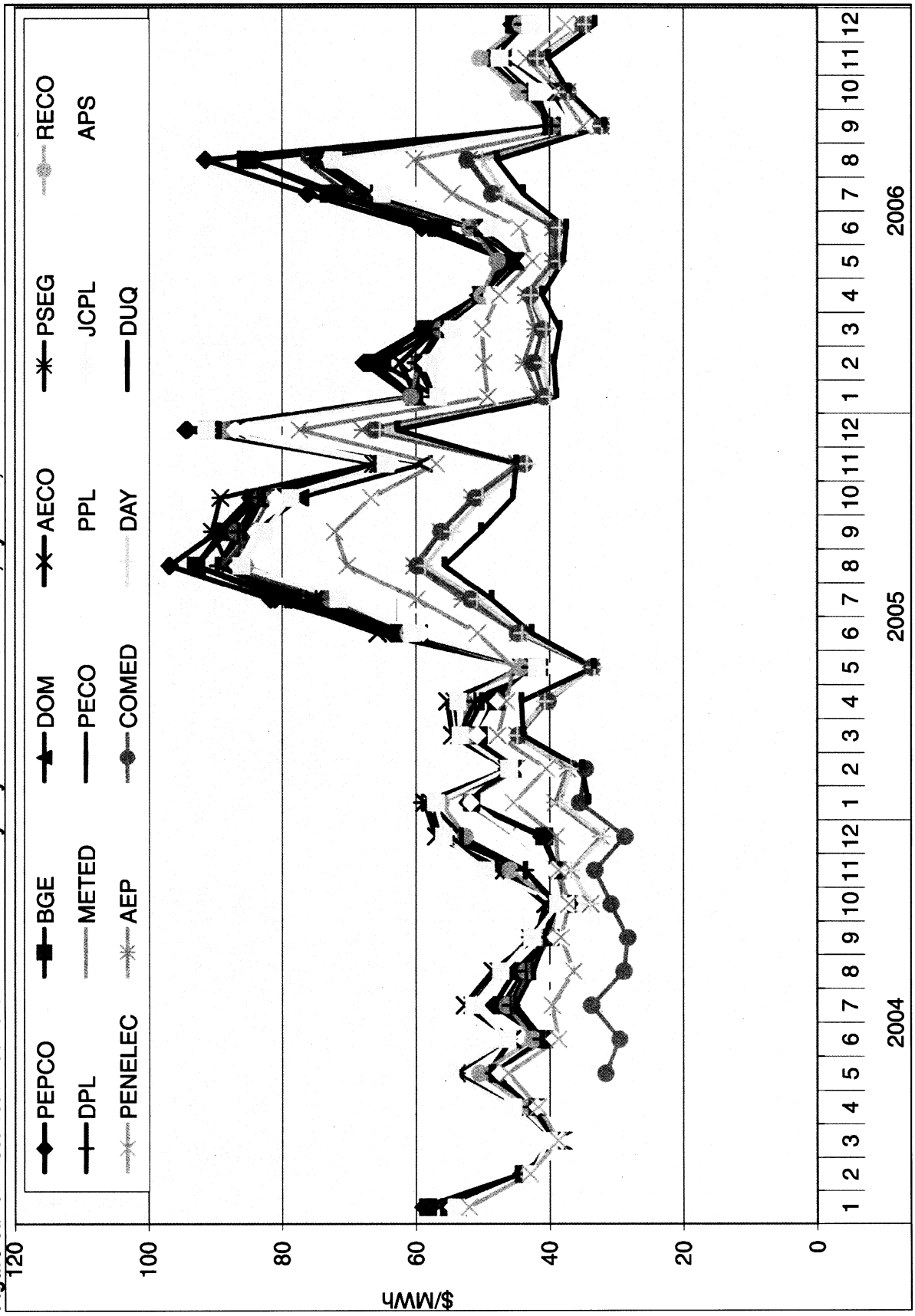
1. Economic Development Considerations

Data from January 2004 through December 2006 confirm that despite the fact that PJM has been operating as a single market, transmission constraints result in major and persistent disparities in wholesale electricity prices within the market. (See Figure VIII–9.) As a result of these fundamental price disparities, electricity consumers in the eastern portion of PJM's footprint consistently end up paying higher electricity bills than consumers in the western portion.[62]

[61] Whenever a constraint is binding in real time, PJM assesses a transactional congestion charge to those customers whose power is transmitted over the constraint. The charge is the difference in LMP on either side of the constraint multiplied times the amount of power transmitted.

[62] In this analysis, the eastern portion of PJM's footprint includes the service areas of Pepco, Baltimore Gas & Electric Company, Dominion, Atlantic City Electric, PSEG, Rockland Electric Co., Delmarva Power, Jersey Central Power & Light, Met-Ed, PECO, and PPL Electric Utilities. The western portion of PJM's footprint includes the service areas of AEP, Commonwealth Edison (ComEd), The Dayton Power & Light Company (DP&L), and Duquesne Light Company (Duquesne).

Figure VIII-9. Historical Round-the-Clock Monthly Day-Ahead LMPs in PJM, by Zone, 2004-2006




Note: The incomplete price data shown in 2004 and 2005 are the result of new members joining the PJM market: Commonwealth Edison joined in May 2004, American Electric Power and Dayton Power and Light joined in October 2004, Duquesne joined in January 2005, and Dominion joined in May 2005.
Data source: PJM.

As shown in Figure VIII–10[63], the price disparity in monthly average day-ahead LMPs between the Pepco and Duquesne zones was as much as $45/MWh from August 2005 through October 2005 and again in August 2006. More generally, consistently higher prices were experienced in the zones of eastern PJM that serve Washington, DC, Baltimore,[64] Philadelphia, and northern New Jersey. Further, the basic price disparity between the eastern and western parts of PJM's footprint occurred regardless of the time of day. A similar pattern was observed when the data were divided into on-peak and off-peak periods, and when data from PJM's real-time market for the same period were examined.[65] As one might expect, the price disparity widened considerably when the electricity supply system was working close to its physical limits, as on hot summer days. Figure VIII–11 shows hourly day-ahead LMPs for August 8, 2005, when the differential reached its maximum ($270/MWh) for that calendar year.

[63] Note that the incomplete price data shown in Figure VIII–10 in 2004 and 2005 are the result of new members joining the PJM market: ComEd joined in May 2004; AEP and DP&L joined in October 2004; Duquesne joined in January 2005; and Dominion joined in May 2005.

[64] According to a staff report published by the Maryland Public Service Commission (MPSC): Maryland offers a first-hand look at the pricing impacts of congestion. Frederick County is a key congestion point on the west-to-east transmission import path. Three years ago, locational marginal prices (LMPs) for electricity in Maryland west of that point averaged $2.90 per megawatt-hour (MWh) less than prices in Maryland east of that point. By 2006, that gap had risen to $9.43 per MWh. The gap is likely to continue to increase until additional generation becomes available to serve central and southern Maryland and the Eastern Shore, or additional transmission capacity becomes available to import electricity into those regions.

MPSC Staff Report, Electric Supply Adequacy Report of 2007, p. 3 (Jan. 2007) (MPSC Report). The report continues ''Maryland is directly affected by transmission congestion, particularly since it and neighboring states (including the District of Columbia) have to import a large proportion of their energy needs. * * * LMPs in Maryland are among the very highest in PJM.'' *Id.,* p. 11.

[65] *See* Appendix A for additional detail. Appendix A is available at *http://nietc.anl.gov.*

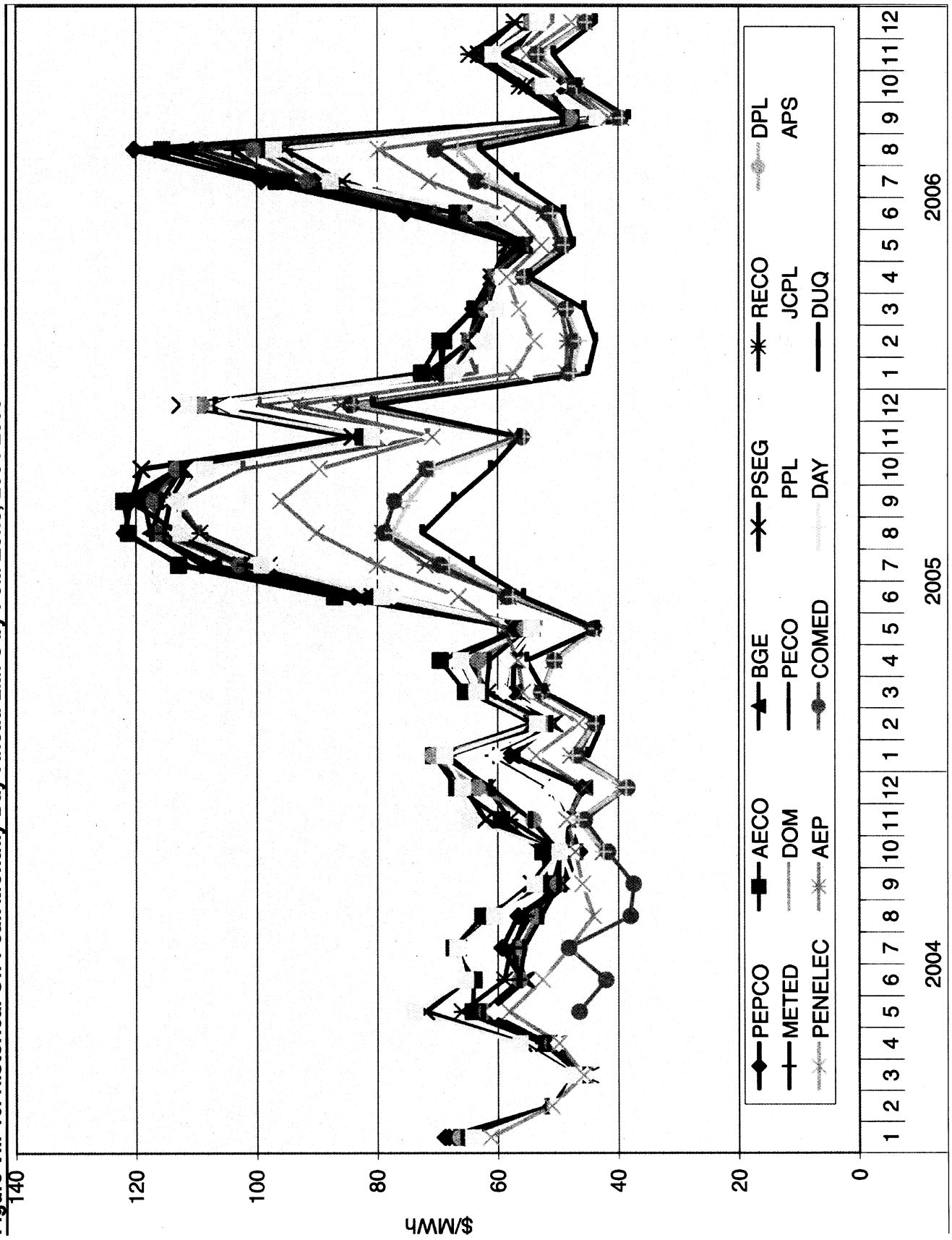
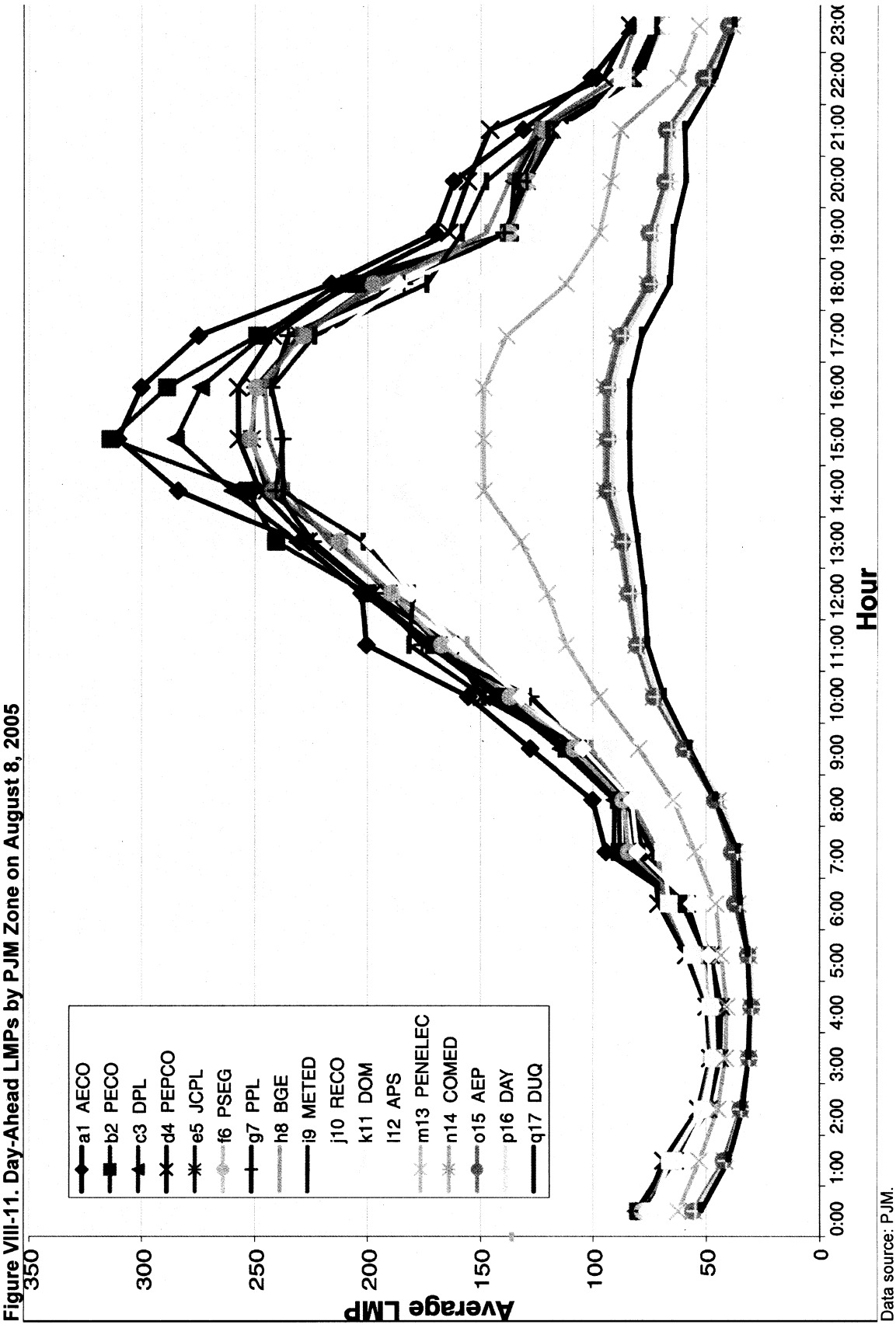



Figure VIII-10. Historical On-Peak Monthly Day-Ahead LMPs by PJM Zone, 2004-2006

Data source: PJM.




For the area served by NYISO, historical electricity price data from 2004 through 2006 show a persistent pattern of substantially lower wholesale electricity prices in the day-ahead market for the western and upstate

zones than in New York City and Long Island. (See Figure VIII–12.) As a result of this persistent disparity, electricity consumers in the area north of New York City, the City itself, and on Long Island end up paying higher electricity bills than consumers in the rest of the State of New York.

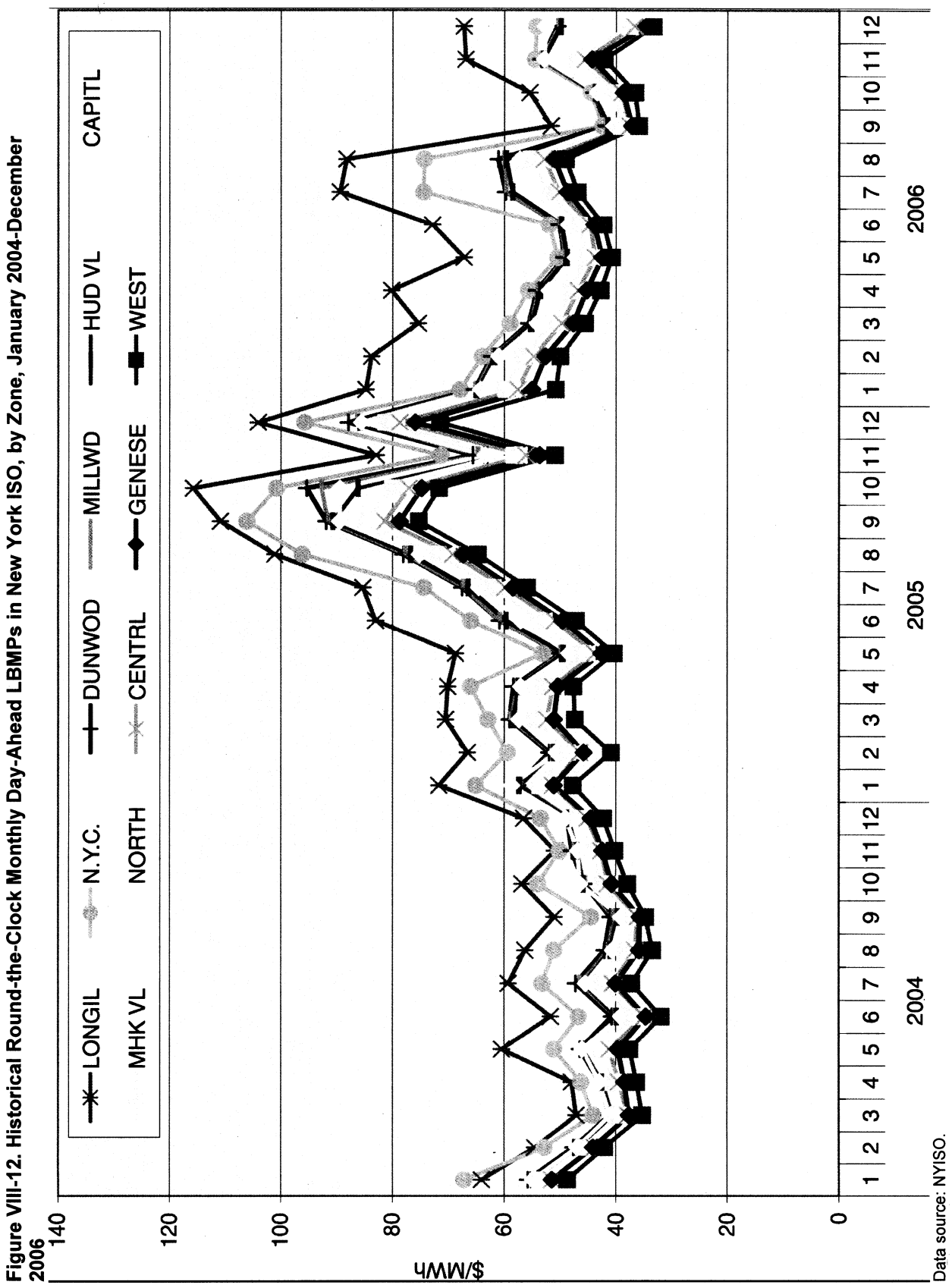
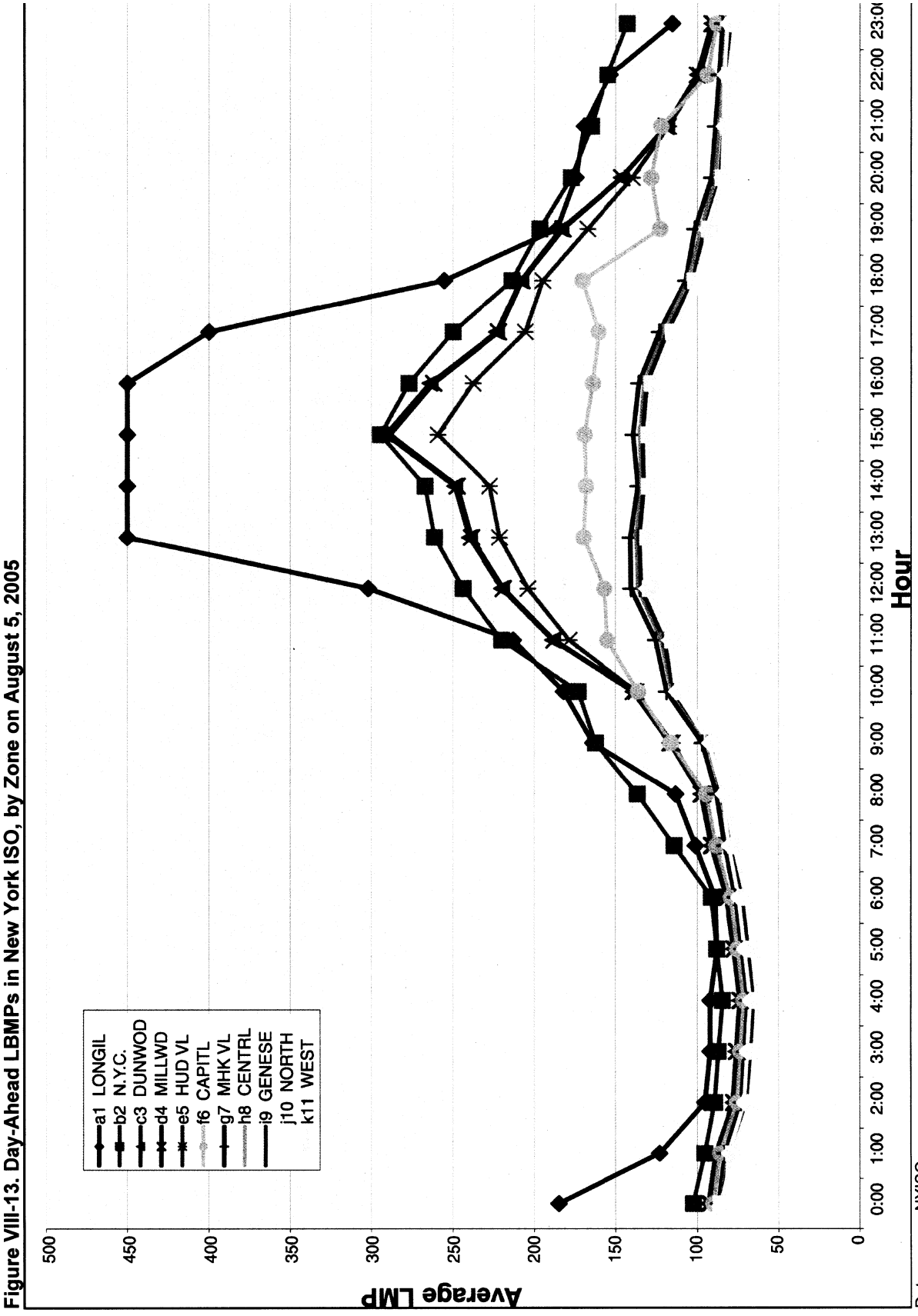



**Figure VIII-12. Historical Round-the-Clock Monthly Day-Ahead LBMPs in New York ISO, by Zone, January 2004-December 2006**

As shown in Figure VIII–12, the difference in monthly average wholesale day-ahead prices between the highest and lowest zones was as much as $44/MWh. A similar pattern is seen if one looks only at the day-ahead on-peak

hours and only at the day-ahead off-peak hours, sometimes with a re-ordering of the zones with intermediate prices. Similar price patterns are also seen in the real-time data.[66] As one might expect, the price disparity widened considerably when the electricity supply system was working close to its physical limits, as on hot summer days. Figure VIII–13 shows hourly day-ahead LBMPs for August 5, 2005, when the differential reached its maximum ($325/MWh) for that calendar year.

[66] *See id.*




In addition, the constraints in New York result in consumers in downstate New York paying disproportionate generation capacity costs. If local load-serving entities were to contract for their electricity supply needs across New

York without regard to the location of the generation capacity, reliability could be imperiled because there would be no assurance that all of the electricity required could actually be delivered to the load centers when needed. To avoid such situations, the New York State Reliability Council has established locational ICAP requirements, according to which generation capacity must be located within New York City sufficient to meet 80 percent of the City's forecast annual peak load. Similarly, 99 percent of Long Island's forecast annual peak load must be located on the Island. Load-serving entities are free to buy their electricity supplies from distant sources when those sources are accessible, but the load-serving entities must also ensure that they have adequate local capacity available at all times. The locational ICAP system enables reliability requirements to be met, but at additional cost to consumers.

To ensure that the locational ICAP requirements are met, NYISO operates an ICAP market. The ICAP market involves the sale of generation capacity, unlike NYISO's day-ahead and real-time markets, which involve the sale of energy. Load-serving entities that have not met their full ICAP requirements through contracts with local generators must participate in NYISO's ICAP market. The ICAP market consists of periodic auctions for three areas: New York City, Long Island, and the New York Control Area (which is all of NYISO).

The amount of capacity that a generator is qualified to provide through the ICAP market is determined by an Unforced Capacity (UCAP) methodology, which accounts for the possibility of forced outages, thus the prices set in the ICAP market are referred to as UCAP prices. As shown in Figure VIII–14, UCAP prices for New York City and Long Island were consistently higher than UCAP prices for the entire New York Control Area over the 26-month period from September 2004 to October 2006, sometimes dramatically so. The substantial differentials between the State-wide UCAP prices and UCAP prices in New York City and Long Island represent a premium the load-serving entities in the City and on Long Island (and their retail customers) must pay to ensure reliability by maintaining local generation capacity instead of improving the transmission system sufficiently to be able to rely more extensively on distant generation sources. This premium is in addition to the higher costs the load-serving entities and their customers pay for electric energy because they are relying to a greater extent on generation sources with higher production costs.[67]

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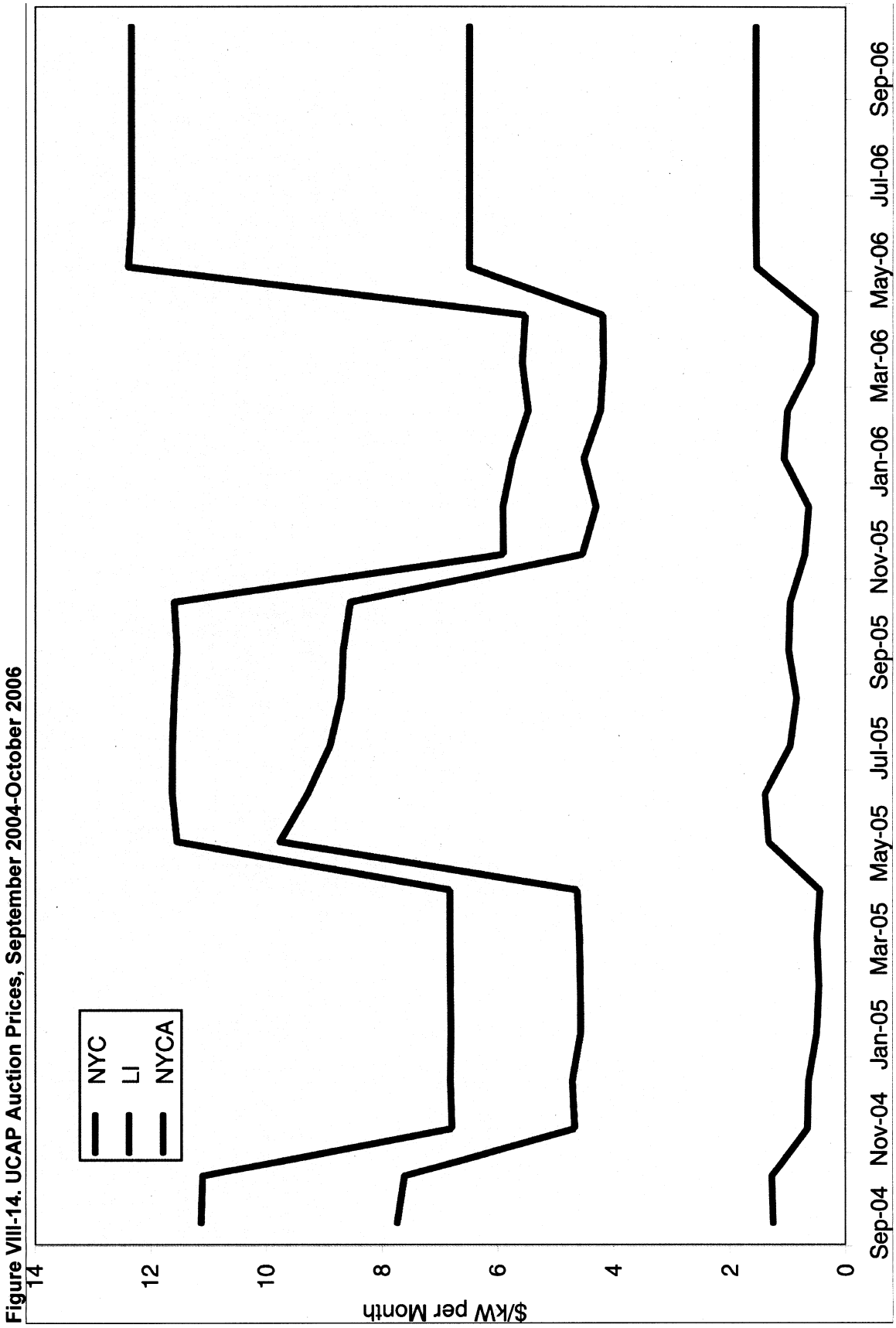
[67] DOE does not mean to imply that large load centers, such as New York City, Long Island, or the major cities in the eastern portion of PJM's footprint could rely entirely on distant generation if sufficient transmission capacity were available. DOE recognizes that some level of local generation is needed to maintain voltage support and stability.




The data detailed above indicate that consumers in the Mid-Atlantic Critical Congestion Area now pay high electricity prices because their electricity suppliers are unable to access low-cost supplies due to insufficient

transmission capacity. Reasonably priced electricity supplies are vital to the economic and social well-being of any metropolitan area. High electricity prices add to the cost of living or doing business in the area, and retard the area's economic growth and competitiveness. Further, one of the considerations identified in FPA section 216(a)(4) is whether ''the economic vitality and development of the corridor, or the end markets served by the corridor, may be constrained by lack of adequate or *reasonably priced electricity.*'' FPA section 216(a)(4)(A); 16 U.S.C. 824p(a)(4)(A) (emphasis added).

Therefore, the Department believes that economic development considerations warrant designation of a National Corridor for the Mid-Atlantic Critical Congestion Area.

2. Reliability Considerations

The constraints limiting delivery of electricity to the eastern portion of PJM's footprint pose a threat to reliability given the steady growth in electricity demand in that area, the area's aging generation fleet with recent retirements of significant amounts of capacity, the slow pace of development of new local generation capacity in that area, and the uncertainties associated with increasing demand response.

Weather-normalized summer peak load for the PJM footprint as a whole is projected to grow at an average rate of 1.6 percent per year for the period 2006 through 2016. However, projected annual growth varies widely among the utilities in PJM's footprint, ranging from 0.7 percent to 2.4 percent, and much of the most rapid growth is concentrated in the eastern portion, and particularly in the Baltimore-Washington-Northern Virginia area.[68]

Between 2003 and 2006, a total of 582 MW of generating capacity in the Baltimore-Washington-northern Virginia area was retired or put on a restricted-use status for environmental reasons.[69] About 200 MW has been added in the area since 2000, and about 20 MW is now under construction. An additional 5600 MW is now proposed for the area, but only 14 MW of it would go into service before 2009, and about 5000 MW is associated with three new nuclear units that would not become available before 2015 or 2016.[70] PJM estimates that 2500 MW of net new generation would need to be installed east of its Loudon substation in northern Virginia to avoid the need for additional transmission in the western portion of its footprint.[71]

Further, while efforts are being made to increase the participation of demand-side resources in the PJM wholesale electricity markets, it does not appear that such efforts are capable of producing near-term results on the scale needed to forestall the need for additional transmission.[72]

Thus, PJM asserts:

> additional transmission capability is essential in [the western portion of PJM's footprint] to maintain reliable and economic service to the Baltimore-Washington-Northern Virginia urban load center. Unless a major new, high-voltage transmission circuit is constructed * * * by 2011, existing 500 kV transmission facilities serving this critical load center will become overloaded, in violation of NERC and PJM reliability and planning criteria * * * Additional transmission capability [in the eastern portion of PJM's footprint] will be needed, in this instance by 2014, to avoid numerous projected violations of NERC and PJM reliability and planning criteria in northern New Jersey.[73]

With regard to New York, since its submission of comments on the Congestion Study, NYISO has published a new Reliability Needs Assessment (2007 RNA) as part of its Comprehensive Reliability Planning Process.[74] The 2007 RNA indicates that the constraints limiting delivery of electricity to southeast New York pose a threat to reliability by 2011, given the growth in electricity demand and the projected retirement of generating units.

NYISO notes that load in southeast New York has been growing by over two percent per year.[75] NYISO estimates that between 2007 and 2009, 1,674.8 MW of generating capacity in New York will be retired, and only 1,203.9 MW of capacity will be added.[76] NYISO describes the effects of these factors on the already constrained transmission system as follows:

> By 2011, the NYCA load forecast estimates that approximately two thirds of the NYCA load will be located in load Zones G through K which is downstream of the UPNY–SENY [Upstate New York-Southeast New York] transmission interface. In addition, approximately 52% of the NYCA load will be located in load Zones J and K, downstream of the Dunwoodie-South transmission interface, which is a slight increase from current load levels.
>
> The demands that are increasingly being placed on the transmission system in conjunction with other system changes, consisting primarily of generating units retirements * * *, load growth, neighboring system changes and the lack of new capacity or transmission resources downstream of the UPNY–SENY interface, have and will continue to result in voltage criteria violations at much lower transfer levels than have previously occurred. The result is that over time, transfers into and through SENY will increasingly be limited by voltage constraints rather than thermal constraints. This reduced capability of the bulk power system to make power transfers into SENY due to these voltage constraints, coupled with continuing load growth in SENY results in a resource adequacy criterion violation by 2011.[77]

The data detailed above indicate that consumers in the Mid-Atlantic Critical Congestion Area face threats to reliability if existing congestion problems are not addressed. Reliable electricity supplies are vital to the economic and social well-being of any metropolitan area. Electricity supply disruptions may come in many forms, ranging from brief disturbances in power quality and localized outages to large-scale, cascading blackouts. The exact cost of electric supply disruptions is difficult to quantify and varies depending upon the specific circumstances. However, such disruptions can impose enormous costs on consumers and may also, under

[68] Comments of PJM, p. 28.

[69] *Id.,* p. 30. In Maryland, recently enacted environmental legislation will cause: Owners of at least two Maryland coal-fired power plants to consider whether it is possible, or worthwhile, to install the necessary [control] equipment. Any existing Maryland coal plants that may have to be retired will exacerbate the existing reliability challenges and increase the possibility of supplies during peak periods not being able to meet the demand for electricity. The consequences could include periods of voltage reductions and/or rolling outages during peak periods to keep the system from collapsing.

MPSC Report, p. 23.

[70] Comments of PJM, p. 32.

[71] *Id.,* p. 38.

[72] PJM says that:

> [F]or purposes of long-term planning for total system adequacy, substituting [demand response] for incremental transmission capability would require, at best, several times the equivalent amount of new generation that would be needed to offset the new transmission capacity. [Demand response] does not produce a steady stream of MW equivalent output because it is normally cycled over a given time period (i.e., load would be switched off and on to ensure minimal impact to the [demand response] provider, rather than switched off for the entire duration of the system need). Also, [demand response] is produced in a variety of diverse programs, which also result in divergent measurements. Within PJM, [demand response] participants may be price responsive, contractually obligated, or directly controlled. Each category of [demand response] results in a variation of the expected amount, or ''output,'' of [demand response] that is provided when called upon, thereby further complicating the difficulty of determining, for long-term planning purposes, the transmission or generation MW that are equivalent to a stated amount of [demand response].

*Id.,* pp. 38–40.

[73] *Id.,* pp. 5–6.

[74] *See* NYISO, Comprehensive Reliability Planning Process 2007 Reliability Needs Assessment (March 16, 2007).

[75] *Id.,* p. 10.

[76] *Id.,* p. 7.

[77] *Id.,* p. 10.

certain circumstances, pose dangers to public health and safety.

For example, estimates of the total cost of the eastern blackout of August 14, 2003 range between $4 billion and $10 billion (U.S. $) for the United States; in Canada, the same event led to a reduction in gross domestic product of 0.7 percent in August, a net loss of 18.9 million work hours, and manufacturing shipments in Ontario were down $2.3 billion (Canadian $).[78]

Further, one of the considerations identified in FPA section 216(a)(4) is whether ''the economic vitality and development of the corridor, or the end markets served by the corridor, may be constrained by *lack of adequate* or reasonably priced electricity.'' FPA section 216(a)(4)(A); 16 U.S.C. 824p(a)(4)(A) (emphasis added).

Therefore, the Department believes that reliability considerations warrant designation of a National Corridor for the Mid-Atlantic Critical Congestion Area.

3. Supply Diversity and Energy Independence Considerations

Much of the existing generation fleet in the eastern portion of PJM's footprint is fueled by oil or natural gas. For example, about 28 percent of the installed generation capacity in Maryland and the District of Columbia is either solely oil-fired or capable of using both oil and natural gas as fuels, as is 35 percent of the installed capacity in Delaware. Further, more than 75 percent of the generation capacity that has been added in recent years in Delmarva, Maryland, the District of Columbia, and New Jersey has been fueled by natural gas.[79] By contrast, the overall generation mix in PJM's footprint is 41 percent coal and 9 percent oil; coal provides more than 56 percent of total output from PJM units. Further,

> More than 6000 MW of additional coal-fired generation, some utilizing clean-coal technology, is currently under construction or active in PJM's interconnection queue. All of this capacity is or will be located far from the Baltimore-Washington-Northern Virginia load centers. Moreover, approximately 12,000–15,000 MW of additional wind-powered generation is either under construction or under active study in PJM's interconnection queue. With the exception of one plant under construction on the New Jersey coast, all of these facilities are or will be located west of the [eastern] load centers.[80]

Accordingly, one of the consequences of transmission congestion in the eastern portion of PJM's footprint is that it prolongs and exacerbates the area's existing use of oil and natural gas as generation fuels.

Most of the existing generation fleet in the downstate portion of New York is fueled by oil or natural gas. On a State-wide basis, about 39 percent of the electricity used in New York in 2005 came from oil or gas units, and 32 percent came from coal or hydroelectric capacity.[81] The absence of transmission facilities that would enable more hydro-, wind-, or coal-based electricity to reach the downstate load centers prolongs the area's current relatively high dependence on oil and natural gas as fuel sources.

Oil and natural gas are relatively high in price and must be purchased in markets that are highly volatile and subject to unanticipated international trends and adverse events. Inadequate transmission capacity leaves consumers in the Mid-Atlantic Critical Congestion Area exposed, perhaps increasingly, to the higher prices and higher price volatility associated with these generation fuels, with a resulting impact on business certainty, especially for industrial consumers. Lack of adequate transmission capacity also limits the Mid-Atlantic Critical Congestion Area's access to generation fueled by domestic sources that could displace generation fueled by foreign sources. Thus, economic growth may be jeopardized and energy independence is compromised. Further, one of the considerations identified in FPA section 216(a)(4) is whether ''(i) economic growth in the corridor, or the end markets served by the corridor, may be jeopardized by reliance on limited sources of energy; and (ii) a diversification of supply is warranted.'' FPA section 216(a)(4)(B); 16 U.S.C. 824p(a)(4)(B). Another consideration identified in that statute is whether ''the energy independence of the United States would be served by the designation.'' FPA section 216(a)(4)(C); 16 U.S.C. 824p(a)(4)(C).

Therefore, the Department believes that supply diversity and energy independence considerations warrant designation of a National Corridor for the Mid-Atlantic Critical Congestion Area.

4. National Defense and Homeland Security Considerations

The Mid-Atlantic Critical Congestion Area is home to 55 million people (19 percent of the Nation's 2005 population)[82] and is responsible for $2.3 trillion of gross state product (18 percent of the 2005 gross national product).[83] Given the large number of military and other facilities in the Mid-Atlantic Critical Congestion Area that are extremely important to the national defense and homeland security, as well as the vital importance of this populous area to the Nation as an economic center, any deterioration of the electric reliability or economic health of this area would constitute a serious risk to the well-being of the Nation. Further one of the considerations identified in FPA section 216(a)(4) is whether ''the designation would enhance national defense and homeland security.'' FPA section 216(a)(4)(E); 16 U.S.C. 824p(a)(4)(E).

Therefore, the Department believes that national defense and homeland security considerations warrant designation of a National Corridor for the Mid-Atlantic Critical Congestion Area.

*D. Boundaries of the Draft Mid-Atlantic Area National Corridor*

In this section, the Department first explains how it determined the general extent of the draft Mid-Atlantic Area National Corridor using a source-and-sink approach. Then the Department explains how it delineated specific boundaries for the draft Mid-Atlantic Area National Corridor.

1. General Extent of the Draft Mid-Atlantic Area National Corridor

In order to set the boundaries of the draft Mid-Atlantic Area National Corridor, DOE used the general source-and-sink approach described in Section III above. The sink areas are the locations of the consumers adversely affected by the persistent congestion documented in Section VIII.B above. Specifically, the sink areas are the areas downstream of the constraints identified in Section VIII.B above, from metropolitan New York City south along the Atlantic coast to northern Virginia.

[78] U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, p. 1 (April 2004).

[79] Comments of PJM, p. 51.

[80] *Id.,* pp. 52 and 78.

[81] NYISO presentation prepared for Sept. 11, 2006, meeting with DOE.

[82] U.S. Census Bureau, Population Estimates Program, *http://factfinder.census.gov/*

[83] *See* Bureau of Economic Analysis, National Economic Accounts, *http://www.bea.gov/bea/dn/home/gdp.htm.*

With regard to selecting source areas, as discussed in Section III above, the Department was guided by the considerations identified in FPA section 216(a)(4). In particular, the Department focused on the considerations of ensuring adequate supplies of reasonably priced power,[84] diversifying supply,[85] and furthering energy independence.[86] Applying those considerations, DOE selected as source areas locations of substantial amounts of existing, under-used economic generation capacity, as well as locations with the potential for substantial development of wind generation capacity. The existing under-used economic generation capacity could readily ensure adequate supplies of reasonably priced power if additional transmission capacity were made available. In addition, increased access to this under-used economic generation capacity, which is predominantly coal-fired, as well as to the wind generation capacity would help diversify supply and increase energy independence for the Mid-Atlantic Critical Congestion Area. Figure VIII–15 indicates the locations of the source areas in upstate New York, western New York, western Pennsylvania, western Maryland, West Virginia, Ohio, Indiana, and Kentucky.[87]

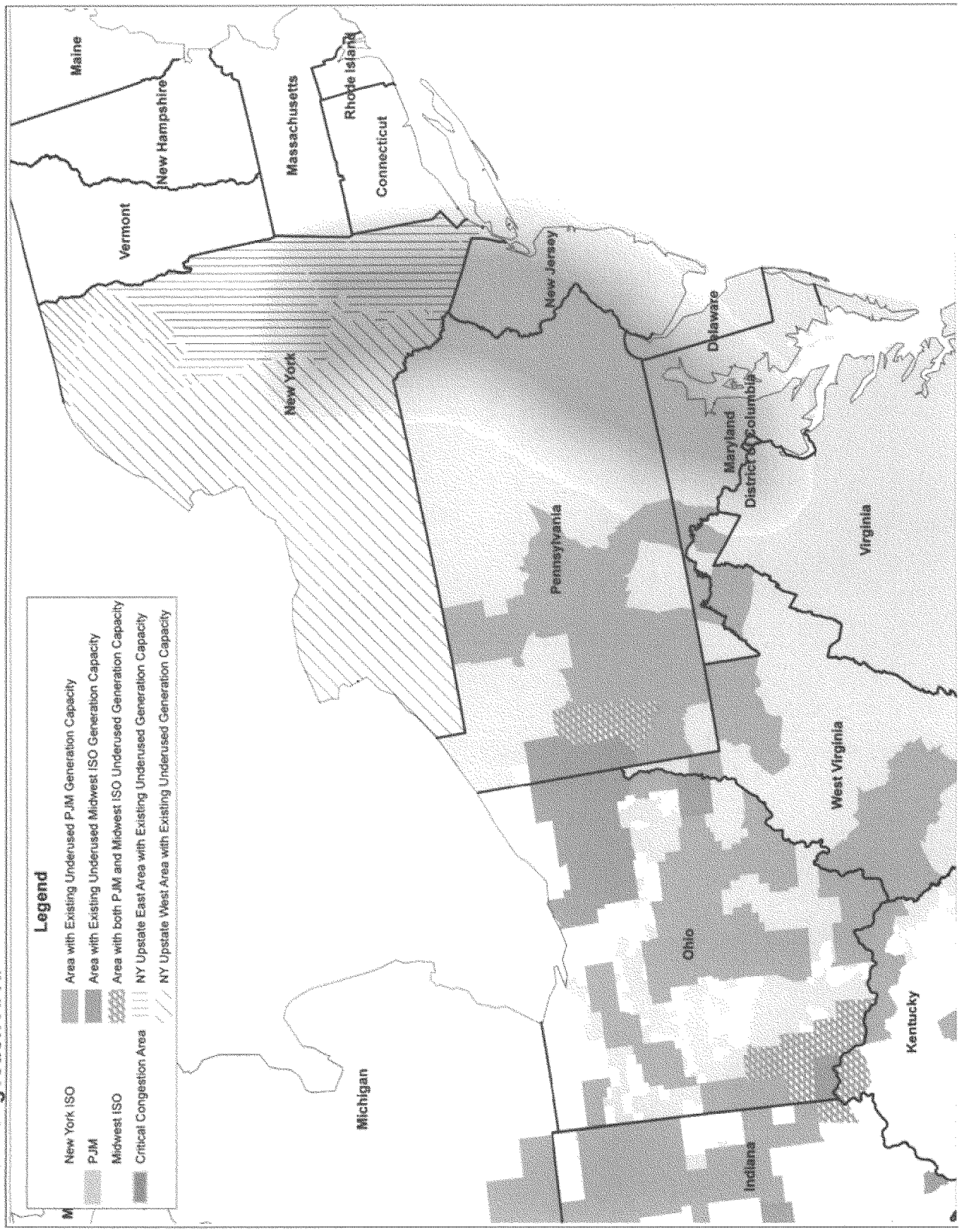
[84] *See* FPA sec. 216(a)(4)(A).

[85] *See* FPA sec. 216(a)(4)(B).

[86] *See* FPA sec. 216(a)(4)(C).

[87] The existing, under-used economic generation capacity used to establish the source areas was identified through the analysis summarized in Appendix A (available at *http://nietc.anl.gov*). The potential wind generation capacity used to establish the source areas was identified through State-level maps of potential wind resources. Those maps are provided in Appendix B, which is available at *http://nietc.anl.gov*.

**Figure VIII-15. Approximate Locations of Existing Non-Renewable Low-Cost Generation Sources in Relation to Mid-Atlantic Critical Congestion Area**




Note: For the locations of potential renewable generation resources by state, see Appendix B.
Source: U.S. Department of Energy, 2007.

Having identified the source and sink areas, DOE next sought to determine which transmission constraints most limit the delivery of electricity from the source areas to the sink areas. The results of this inquiry are shown in Figure VIII–16.

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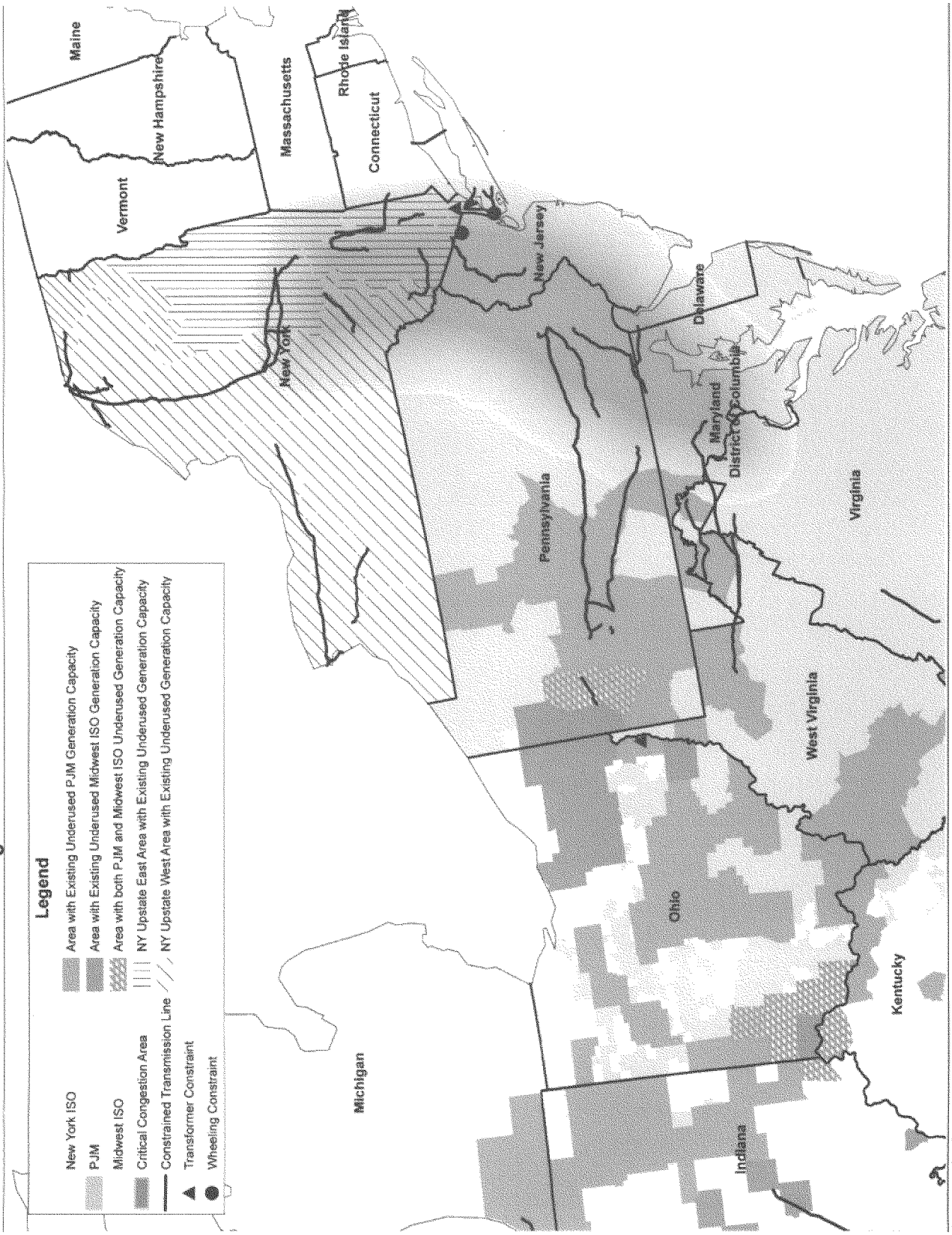



In the PJM footprint, the major obstacles to increased west-to-east flows are three groups of heavily loaded large high-voltage transmission lines. One group extends from northern West Virginia and western Maryland into

northern Virginia and central Maryland; a second group extends from western Pennsylvania into central Pennsylvania; and the third is a cluster of lines located mostly in eastern Pennsylvania but also extending into northeastern Maryland, northern Delaware, and northern New Jersey. The net effect of these constraints is to prevent the delivery of increased amounts of electricity in bulk from the source areas in the Midwest to the load centers in the Baltimore-Washington-Northern Virginia area, Philadelphia, Wilmington, the Delmarva peninsula, and the urban centers in central and northern New Jersey.[88]

Somewhat similarly, providers of electricity to consumers in the New York City area have limited access to the source areas in upstate New York and in the western part of the State, due to several clusters of transmission constraints within New York State.[89] Conceivably, New York City's needs might be satisfied to some degree through increased transmission access to PJM, but that could exacerbate the existing and projected congestion problems in the PJM footprint—unless it were done as part of some larger, well-coordinated plan between PJM and NYISO and their respective members. The constraints of particular interest in New York State are: a group between New York City and the existing substations at Marcy and Edic (near the city of Utica); a group to the south and east of the city of Massena; and a group in the western part of the State, between the cities of Buffalo and Syracuse.[90]

Thus, within PJM's footprint, the draft National Corridor encompasses the problematic existing west-to-east transmission lines; further, the draft National Corridor is broad enough, north-to-south, to encompass a range of potential projects and a range of potential routes to facilitate additional west-to-east flows. In addition, the draft National Corridor includes the sink areas as well, because it is frequently the case that the full potential benefits associated with a major new line will not be gained unless key improvements are made in the area to which the electricity is to be delivered. Somewhat similarly, the draft National Corridor extends far enough into the source areas to encompass a number of possible strong points on the transmission network that serves those areas.

In New York, the draft National Corridor extends northward from the area immediately north of New York City to the vicinity of Utica; then it divides into two legs, one to the Massena area and one to the Buffalo area. As with the section in the PJM footprint, this section of the draft National Corridor is broad enough to encompass a range of potential projects and a range of potential routes, and it includes the sink areas as well to encompass appropriate upgrades there. Further, as shown in Figure VIII–17, there are several important transmission constraints between New York City and Long Island. As a result, no solutions to New York City's congestion problems should be planned without considering Long Island, and thus the draft National Corridor includes Long Island.

[88] Figures VIII–15 and -16 present results of additional analysis, using outputs from the simulation of 2008 generation and power flows prepared for the Congestion Study. For additional detail, see Appendix A (available at *http://nietc.anl.gov*).

[89] These constraints also happen to limit access to additional generation capacity located outside New York State, in Quebec, Ontario, and Michigan.

[90] *See* Appendix A (available at *http://nietc.anl.gov*) for additional detail.

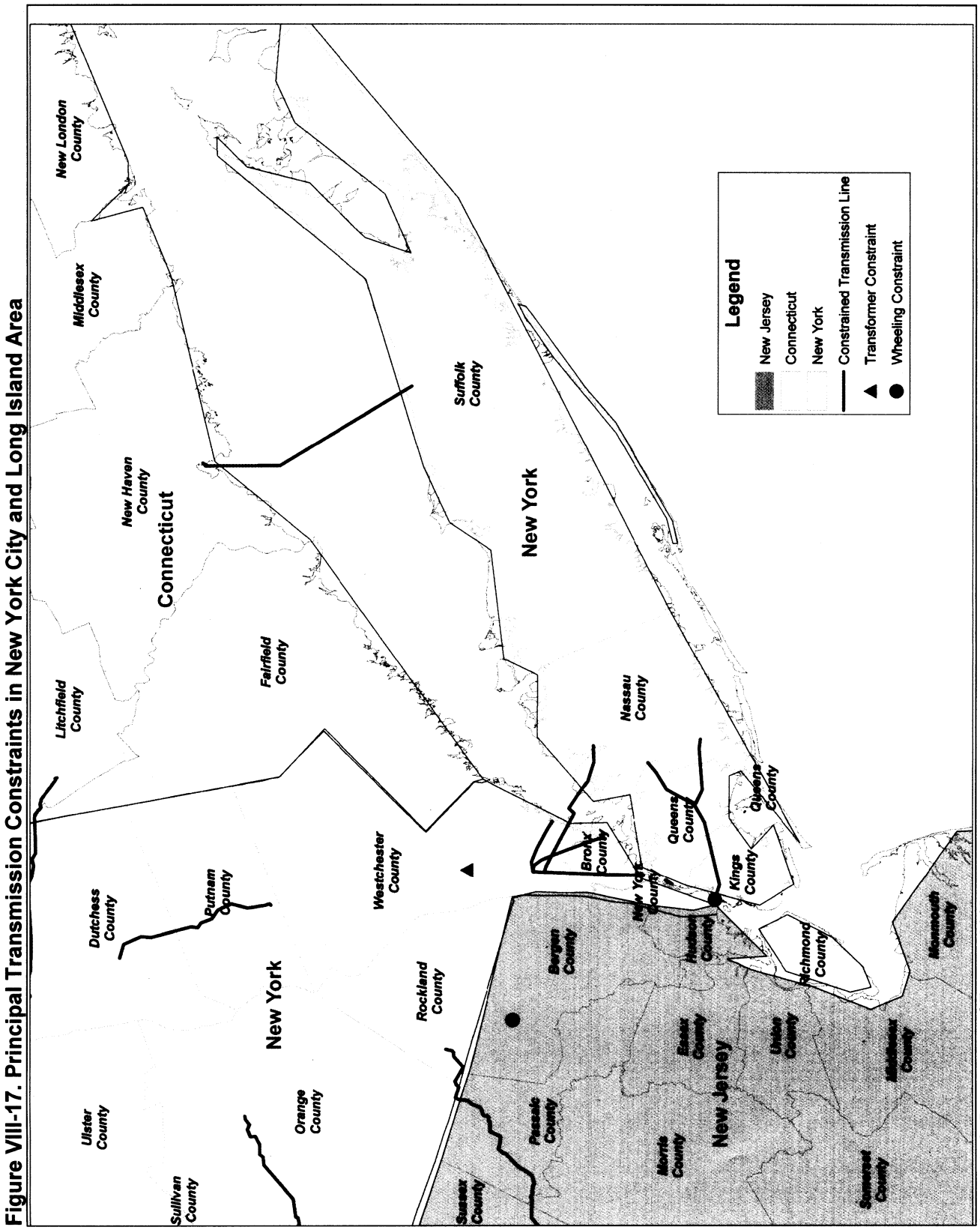



Figure VIII-17. Principal Transmission Constraints in New York City and Long Island Area

Source: U.S. Department of Energy, 2007.

Finally, although for ease of presentation the discussion thus far has focused on a draft National Corridor in the PJM footprint and a draft National Corridor in New York, the two areas are contiguous along a part of the shared border between the PJM and NYISO footprints. Accordingly, the draft National Corridor for the Mid-Atlantic Critical Congestion Area is a single Corridor—the draft Mid-Atlantic Area National Corridor—covering part of the

PJM footprint and part of New York, partly because some of the transmission planning that is needed should involve both PJM and NYISO, and also because transmission projects may be proposed that would cross their common boundary.

2. Specific Boundaries of the Draft Mid-Atlantic Area National Corridor

Having identified the sink and source areas on which to base the draft Mid-Atlantic Area National Corridor, as well as the constraints that must be encompassed in the National Corridor, DOE then delineated the specific boundaries of the draft Mid-Atlantic Area National Corridor. Again, for ease of presentation, the Department will discuss the draft Mid-Atlantic Area National Corridor in terms of a section within the PJM footprint and a section in New York; however, the Department notes that it is a single draft Mid-Atlantic Area National Corridor that is under consideration.

For the section within the PJM footprint, DOE first identified some general boundary points, and then linked certain of these points by means of straight lines to form a polygon. It would be impractical, however, to treat the polygon as this section of the draft Mid-Atlantic Area National Corridor, because that would not enable precise, easily identified boundaries in all areas. Accordingly, if the polygon includes some part of a county (or a city not included within a county), the Department has included all of that county or city in the draft National Corridor. This approach enlarges the draft Mid-Atlantic Area National Corridor but, in addition to establishing readily identifiable boundaries, helps ensure that the draft National Corridor encompasses a range of potential projects and a range of potential routes, as discussed in Section III above.

The western margin of the section of the polygon within the PJM footprint, in functional terms, is the eastern edge of the existing 765 kV transmission network in the Midwest, beginning with the South Canton substation, located near Canton, Ohio, continuing on to other substations to the south located on one side or the other of the Ohio River (which forms the boundary between Ohio and West Virginia), and ending with the John Amos substation near Charleston, West Virginia. Tapping into this network with new west-to-east transmission lines would enable access to generation capacity throughout the source areas.

The eastern margin of the section of the polygon within the PJM footprint is a straight line from the Calvert Cliffs substation in southern Maryland due east to the Atlantic shoreline, and then generally northward following the Atlantic shoreline and then up the Hudson River to the northeastern corner of New Jersey. The area around the Calvert Cliffs substation is of interest because if additional nuclear generating capacity is developed at the Calvert Cliffs nuclear plant or at nearby Virginia plants, additional transmission capacity would be needed to enable the electricity output to be moved from the Calvert Cliffs substation (or other relevant substations within the polygon) to the load centers in the sink area. If the nuclear capacity is not developed, the sink area could still benefit from development of additional west-to-east transmission capacity across the PJM footprint.

The Department has extended the draft National Corridor to the actual shoreline not because major new transmission lines are likely to be sited in such areas, but rather because these areas are sink areas, and transmission upgrades in some locations within these areas may be needed to gain the full benefit of improving their access to the source areas.

The southern margin of the section of the polygon within the PJM footprint is a straight line between the John Amos substation and the Calvert Cliffs substation.

The northern margin of the section of the polygon within the PJM footprint is: a straight line between the South Canton substation and the Susquehanna substation (which is the northernmost 500 kV substation in eastern PJM); a straight line from the Susquehanna substation due north to the Pennsylvania-New York border; the Pennsylvania-New York border east and southeast to the border between Pennsylvania and New Jersey; and then the border between New York and New Jersey southeast to the northeast corner of New Jersey.

Connecting the points described above produces the polygon shown in Figure VIII–18. Defining the draft National Corridor boundaries as including all of the partially enclosed cities or counties, as shown in Figure VIII–19, establishes the portion of the draft Mid-Atlantic Area National Corridor within the PJM footprint.

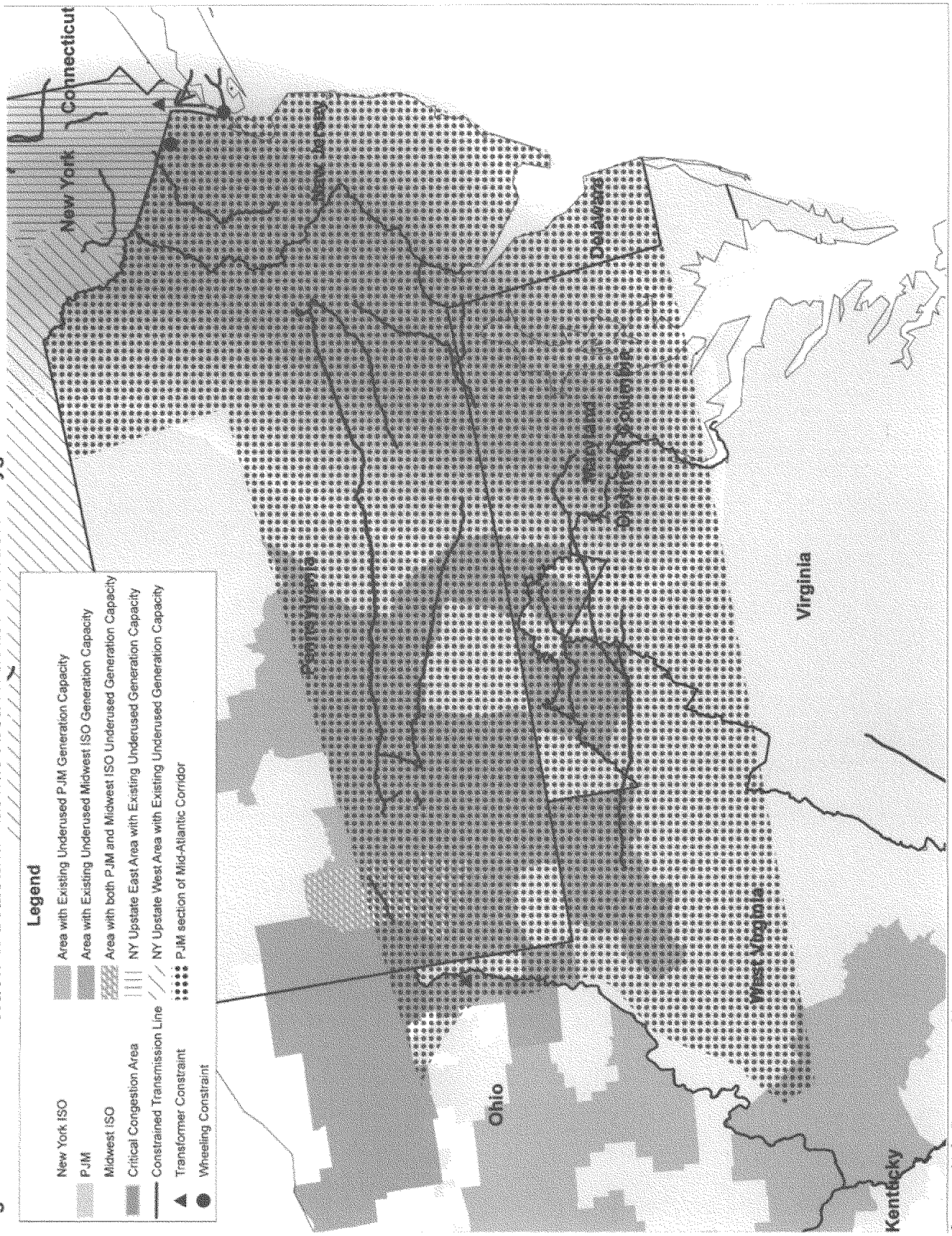
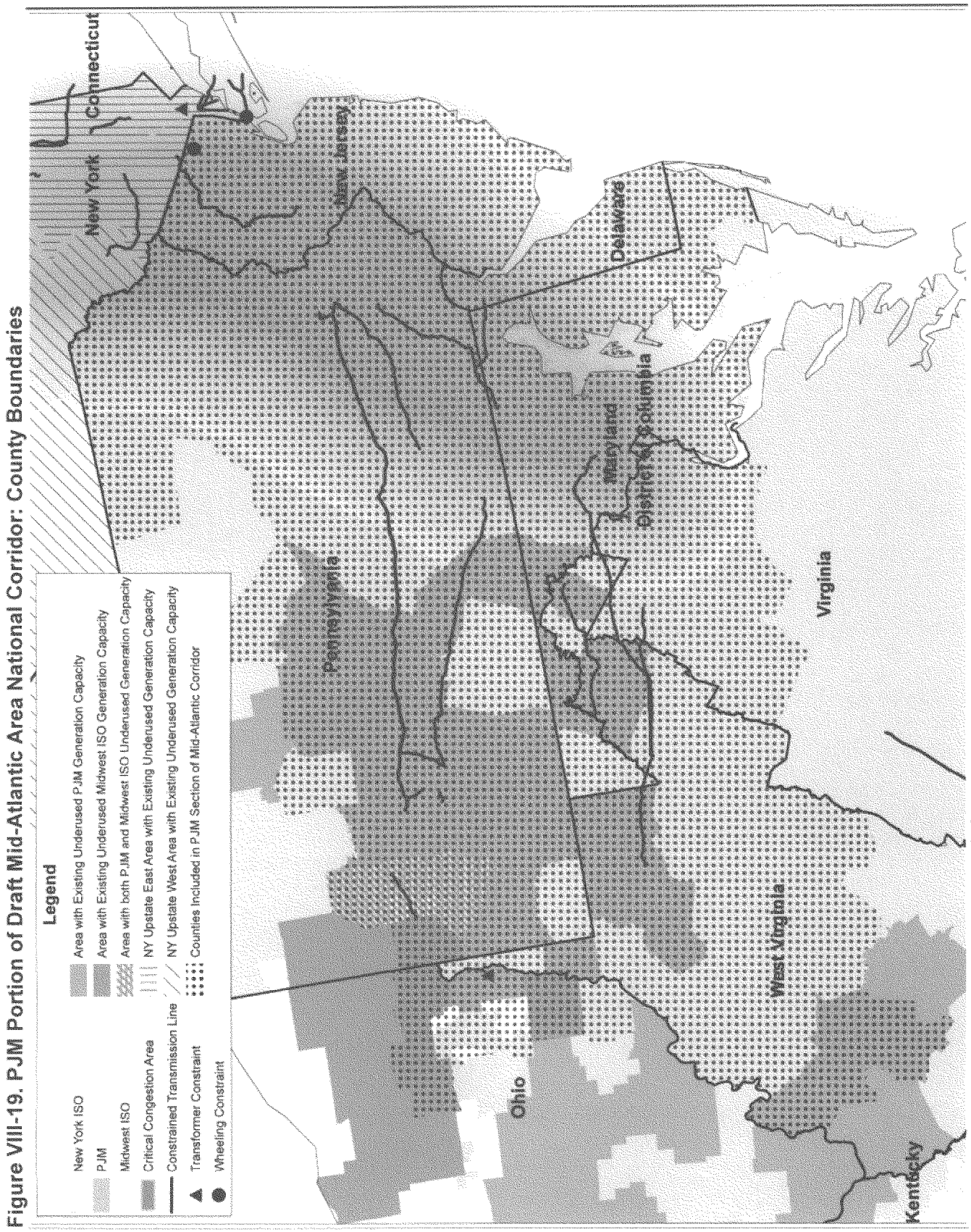



Figure VIII-18. PJM Portion of Draft Mid-Atlantic Area National Corridor: Polygon

Source: U.S. Department of Energy, 2007.




For the section of the draft Mid-Atlantic Area National Corridor within New York, DOE has adopted a somewhat simpler approach based more directly on county boundaries. DOE has identified four areas within New York

for inclusion in the draft Mid-Atlantic Area National Corridor.

The first area is New York City and Long Island. This area is included because it is a sink area.

Second is a central upstate area, extending from New York City northward to include an area around the city of Saratoga Springs, and westward to include an area around the city of Utica. This central upstate area encompasses a number of the existing constraints that limit the delivery of additional electricity in bulk from the source areas to the sink areas. Although easing the constraints in this area could provide benefits in the sink areas, these benefits could be limited unless some of the key constraints further to the north and to the west were also addressed. Therefore, the Department has included the following two additional areas in the draft National Corridor.

The draft National Corridor includes an area to the south and east of the city of Massena, New York. This area encompasses several transmission constraints that may frequently prevent electricity flows from the source areas to the sink areas.

Finally, the draft National Corridor includes an area between the city of Buffalo and the city of Syracuse. This area is a major electricity pathway that is frequently constrained, preventing electricity flows from the source areas to the sink areas.

The resulting New York section of the draft Mid-Atlantic Area National Corridor, based on the boundaries of the affected counties, is shown in Figure VIII–20. The entire draft Mid-Atlantic Area National Corridor is shown in Figure VIII–21.

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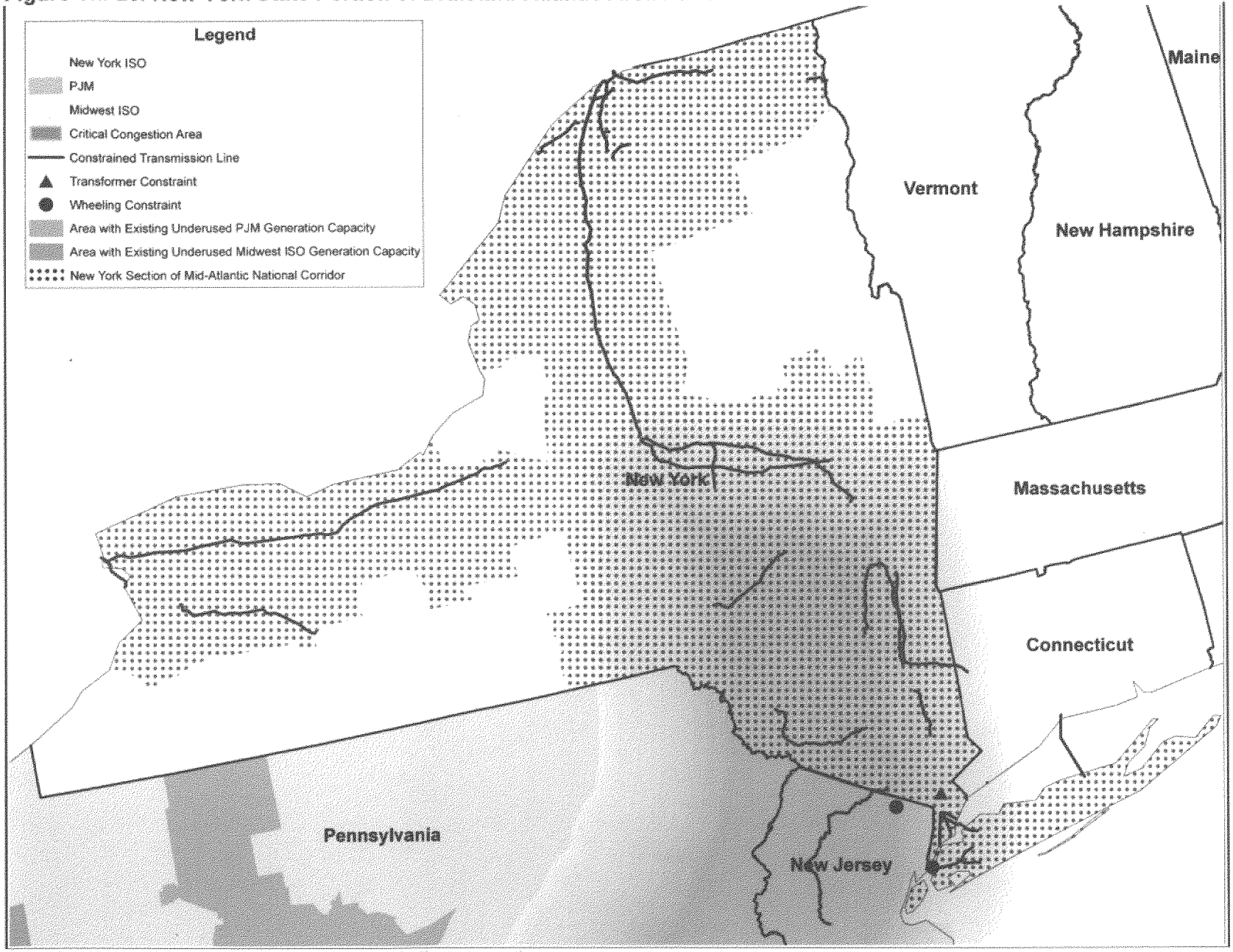
Figure VIII-20. New York State Portion of Draft Mid-Atlantic Area National Corridor




Note: Corridor borders are based on boundaries of affected counties.
Source: U.S. Department of Energy, 2007.

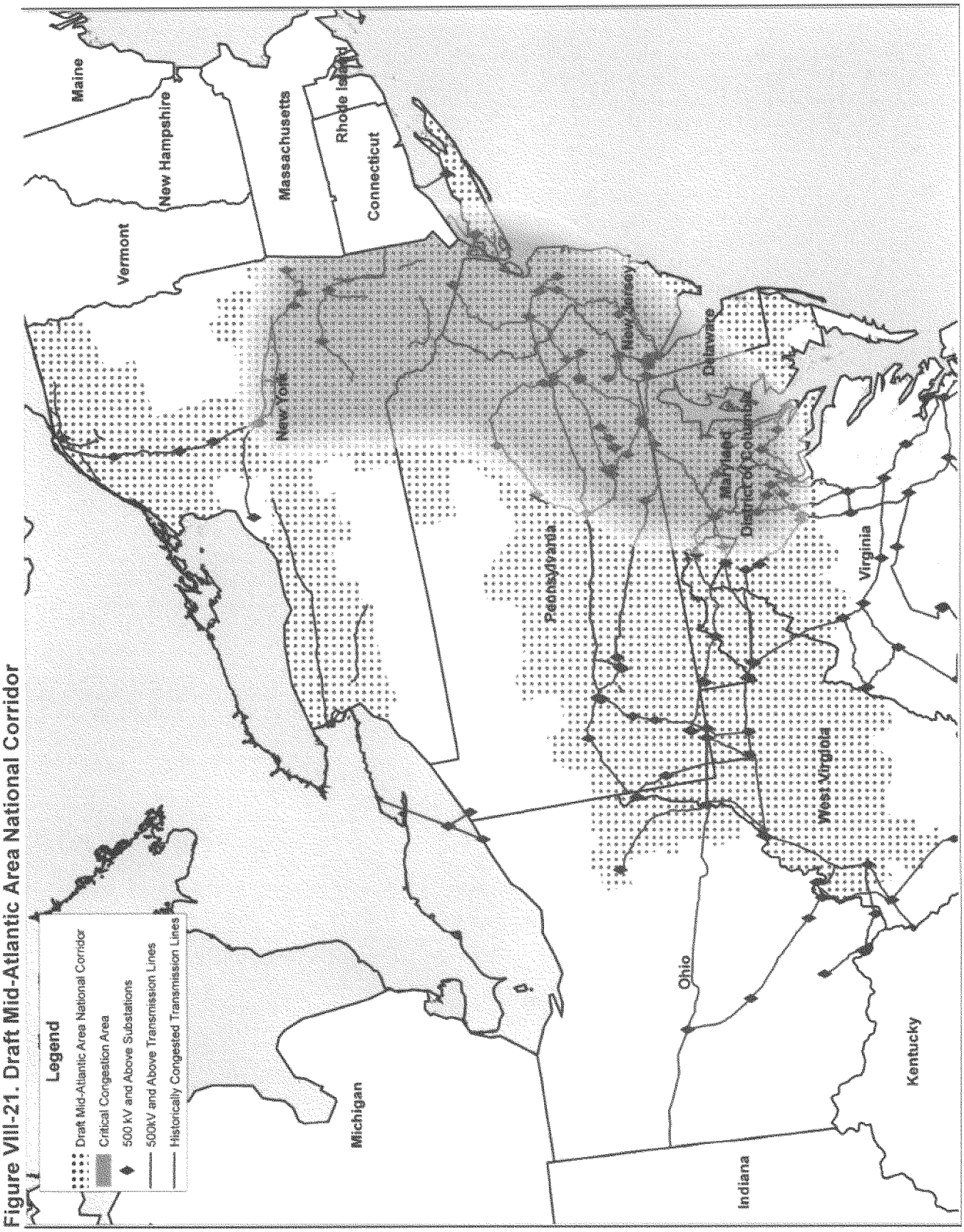



Figure VIII-21. Draft Mid-Atlantic Area National Corridor

Note: County boundaries are shown.
Source: U.S. Department of Energy, 2007.

The list of the counties and cities that comprise the draft Mid-Atlantic Area National Corridor is as follows:

Delaware

Counties: All are included—Kent, New Castle, and Sussex.

District of Columbia

City: Washington.

Maryland

Counties: All are included except Somerset. Those included are Allegany, Anne Arundel, Baltimore, Calvert, Caroline, Carroll, Cecil, Charles, Dorchester, Frederick, Garrett, Harford, Howard, Kent, Montgomery, Prince George's, Queen Anne's, St. Mary's, Talbot, Washington, Wicomico, and Worcester.

City: Baltimore.

New Jersey

Counties: All are included—Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Sussex, Union, and Warren.

New York

Counties: Albany, Bronx, Broome, Cayuga, Chenango, Clinton, Columbia, Delaware, Dutchess, Erie, Franklin, Fulton, Genesee, Greene, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Otsego, Putnam, Queens, Renssalaer, Richmond, Rockland, St. Lawrence, Saratoga, Schenectady, Schoharie, Seneca, Suffolk Sullivan, Ulster, Wayne, Westchester, and Wyoming.

Ohio

Counties: Belmont, Carroll, Columbiana, Harrison, Jefferson, and Stark.

Pennsylvania

Counties: Adams, Allegheny, Armstrong, Beaver, Bedford, Berks, Blair, Bradford, Bucks, Butler, Cambria, Centre, Chester, Clearfield, Clinton, Columbia, Dauphin, Delaware, Fayette, Franklin, Fulton, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Mifflin, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Pike, Schuylkill, Snyder, Somerset, Susquehanna, Union, Wayne, Washington, Westmoreland, Wyoming, and York.

Virginia

Counties: Arlington, Clarke, Culpeper, Fairfax, Fauquier, Frederick, Loudon, Madison, Page, Prince William, Rappahannock, Rockingham, Shenandoah, Stafford and Warren.

Cities: Alexandria, Harrisonburg, Fairfax, Falls Church, Manassas, Manassas Park, and Winchester.

West Virginia

Counties: Barbour, Berkeley, Braxton, Brooke, Calhoun, Clay, Doddridge, Gilmer, Grant, Hampshire, Hancock, Hardy, Harrison, Jackson, Jefferson, Lewis, Marion, Marshall, Mineral, Monongalia, Morgan, Nicholas, Ohio, Pendleton, Pleasants, Pocahontas, Preston, Randolph, Ritchie, Roane, Taylor, Tucker, Tyler, Upshur, Webster, Wetzel, Wirt, and Wood.

## IX. Draft Southwest Area National Corridor

### *A. Alternatives and Recommendations*

In response to the Congestion Study, the Department received a number of National Corridor alternatives and recommendations for the Southern California Critical Congestion Area.

SCE recommended a National Corridor to encompass the general anticipated route of a transmission line it is proposing to build between the Palo Verde hub in Arizona and Palm Springs, California (Devers-Palo Verde 2 or DPV2). EEI supported SCE's recommended National Corridor, citing the need to remedy the existing and growing congestion problems in the Southern California Critical Congestion Area as well as the need for utilities in the State to meet renewable energy requirements.

San Diego Gas and Electric Company (SDG&E) recommended a National Corridor to encompass the general anticipated route of a transmission line it is proposing to build through Imperial County, California to San Diego, California (Sunrise Powerlink).

The Nevada Hydro Company, Inc. (Nevada Hydro) recommended a National Corridor to encompass the general anticipated route of a transmission line associated with its proposed Lake Elsinore Advanced Pumped Storage project (LEAPS) in southern California.

Los Angeles Department of Water and Power (LADWP) noted that the Congestion Study had not mentioned LADWP's proposed Green Path North project (Green Path), which it regards as very important to relieving congestion, maintaining reliability in the area west of Devers, and diversifying generation sources by increasing access to 2000 MW of potential geothermal power in the Imperial Valley region. LADWP stated, ''DOE may wish to consider the Green Path North project as a [National Corridor].''

The California Independent System Operator (CAISO) [91] recommended designation of a National Corridor in southern California, citing the current congestion problem in that area as well as the increased congestion expected as a result of high load growth and the potential development of significant wind generation in the Tehachapi area. CAISO stated that the boundaries of a National Corridor in southern California depend on the success of current planned transmission projects. Thus, according to CAISO, if either DVP2 or Sunrise Powerlink were to fail to materialize, there would be a critical need for another transmission link to one of the major substations in the southern part of the Southwest region and/or the Imperial Valley area. CAISO also recommended consideration of a National Corridor that would connect the broader Tehachapi area to the Los Angeles Basin.

CEC agreed with the classification of southern California as a Critical Congestion Area and noted that ''the San Diego region's transmission problems are acute and graphically illustrate the importance of adequate transmission.'' CEC commented that ''California interests could be served by the Federal [National Corridor] planning and permitting processes under certain limited conditions, given the State's history of impediments in developing needed transmission capacity.'' However, CEC stated that the focus of the Congestion Study was too narrow to accommodate State laws and policies on renewable portfolio standards.[92] CEC further commented that because the Department has not discussed how it intends to address environmental assessments in the National Corridor designation process, it remains concerned whether DOE will designate a National Corridor in a manner that adequately considers California's environmental resources, legislation concerning State designation of electric transmission corridors, and use of existing rights of way.[93]

IID acknowledged that the Congestion Study correctly identified the presence of congestion on the intertie between IID's control area and SCE's control area (Path 42). However, IID noted that it has already identified two feasible solutions to mitigate congestion on Path 42, and

[91] CAISO is the ISO serving most of California.

[92] *See* DOE response, Section II.A above.

[93] *See* DOE response, Section III above.

is working on a 500 kV transmission project that would connect with SDG&E's Sunrise Powerlink to alleviate congestion elsewhere in southern California. IID believed that in light of these projects, as well as other efforts underway, it may not be necessary to designate a National Corridor in southern California at this time.

CPUC recommended against any National Corridor designations in southern California at this time. Noting that skepticism about California's siting of infrastructure may have contributed to the identification of southern California as a Critical Congestion Area, CPUC argued that California stakeholders, including CPUC, CAISO, CEC, and the transmission owners, have worked closely together to achieve significant progress in transmission expansion, completing $1.8 billion worth of transmission projects between 2000 and 2004. CPUC noted that it would soon be considering the adoption of a proposed decision that would grant a rebuttable presumption in a CPUC siting proceeding to a CAISO determination that a proposed project is needed.[94]

CPUC further asserted that specific progress is being made in southern California: DPV2 is in the final stages of permitting; [95] a final permitting decision on Sunrise Powerlink is expected the fourth quarter of 2007 or early in the first quarter of 2008; and the permitting processes for three segments of a transmission project related to wind development in the Tehachapi region (Antelope Segments 1, 2, and 3) are close to completion.[96] CPUC stated that National Corridor designation is unwarranted unless there is evidence that State and regional processes are not addressing the problem in a timely manner.[97] CPUC also argued that the Congestion Study exaggerated the significance of congestion into southern California.[98]

After reviewing the alternatives and recommendations provided,[99] the Department believes that designation of a National Corridor for the Southern California Critical Congestion Area may be warranted. In the following sections, the Department will detail its factual finding of the existence of constraints or congestion that adversely affects consumers in the Southern California Critical Congestion Area and explain the considerations that it believes warrant designation of a National Corridor for this area. Finally, the Department will delineate and explain the specific boundaries of the draft National Corridor.

*B. Finding of Constraints or Congestion That Adversely Affects Consumers*

The Congestion Study identified southern California as a Critical Congestion Area, based on evidence of historical, persistent congestion caused by numerous well-known transmission constraints into and within southern California. The congestion caused by these constraints is projected to continue or worsen unless it is addressed through remedial actions. In conducting the Congestion Study, the Department identified and assessed these constraints based on a review of the extant transmission studies and expansion plans available prior to the publication of the Congestion Study.

DOE has assessed these constraints at two levels. In the Congestion Study, DOE assessed congestion at the WECC Path [100] level. (See Figures IX–1, –2, and –3, which are taken from the Congestion Study.) More recently, DOE has reviewed congestion data provided by the Western Area Power Administration (WAPA), and branch group congestion data reported by CAISO. ''Branch groups,'' as defined by CAISO, consist of major groups of lines between CAISO and other areas, plus two large internal paths, WECC Path 15 and WECC Path 26. (See Figure IX–4).

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[94] Since submission of its comments on the Congestion Study, CPUC issued a decision that created a rebuttable presumption in favor of certain economic evaluations by the CAISO. *See* Opinion on Methodology for Economic Assessment of Transmission Projects, CPUC D.06–11–018 (Nov. 9, 2006).

[95] Since submission of its comments on the Congestion Study, CPUC approved construction of the portion of DPV2 within California. *See* Opinion Granting a Certificate of Public Convenience and Necessity, CPUC D.07–01–040 (Jan. 25, 2007). The Arizona Commission has not yet ruled on SCE's application for the portion of the project that would be located in Arizona.

[96] Since submission of its comments on the Congestion Study, CPUC approved construction of Antelope Segments 1, 2 and 3. *See* Opinion Granting a Certificate of Public Convenience and Necessity, CPUC D.07–03–012 (Mar. 1, 2007); and Opinion Granting a Certificate of Public Convenience and Necessity, CPUC D.07–03–045 (Mar. 15, 2007). In its comments on the Congestion Study, CPUC also notes the progress of two other projects, which are not subject to its jurisdiction, that would alleviate congestion in southern California: The Desert Southwest Project sponsored by a number of municipal utilities and LEAPS pending at FERC.

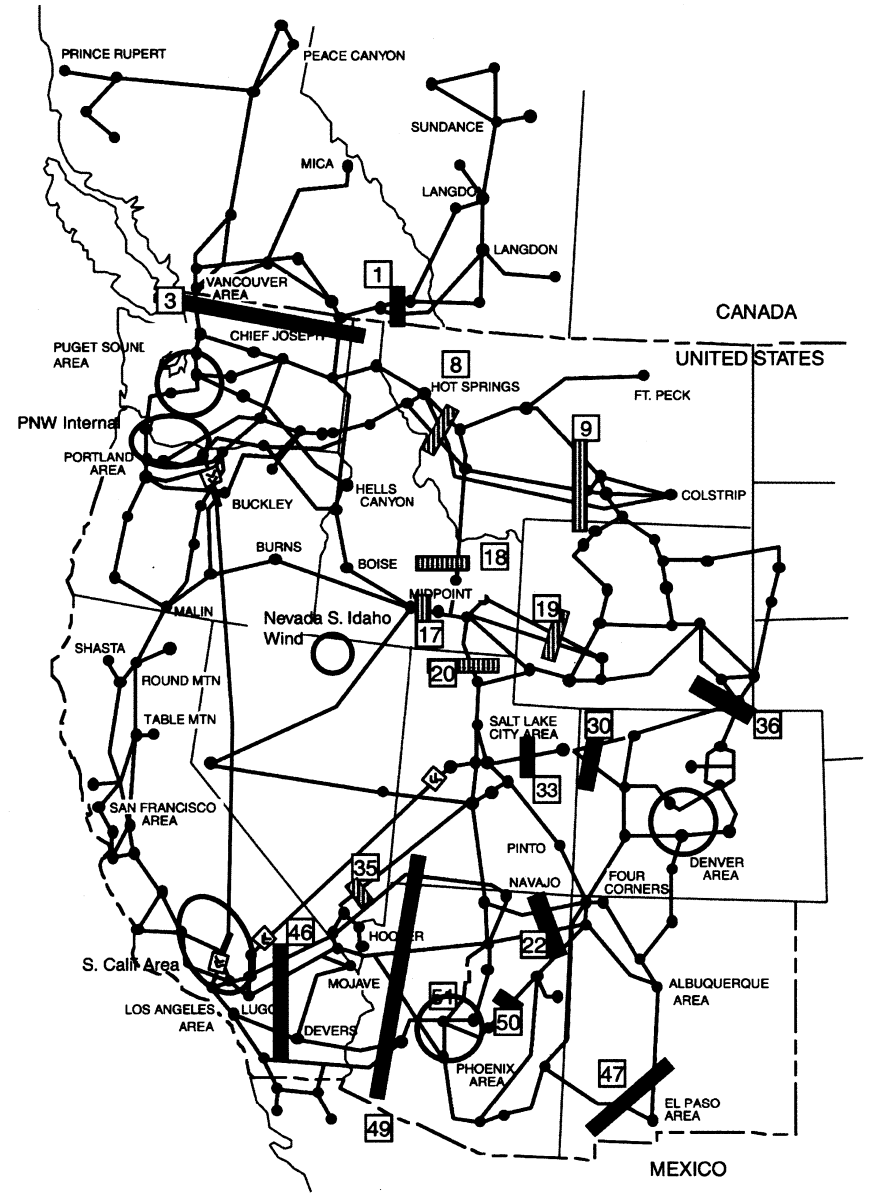
[97] *See* DOE response, Section II.D above.

[98] *See* DOE response, Section VII.C above. CPUC also argued that instead of designating National Corridors in California, the Department should make certain designations of energy corridors on Federal land under EPAct section 368. The Department will address these comments in the ongoing section 368 proceeding.

[99] ACC commented on the Phoenix-Tucson Congestion Area of Concern identified in the Congestion Study as well as the Tucson to Nogales corridor, but did not comment on the Southern California Critical Congestion Area. ACC also emphasized the need for the Department to consult with it prior to designating any National Corridors in Arizona. *See* DOE response, Section IV.B above.

[100] WECC is responsible for coordinating and promoting electric system reliability in all or part of the 14 western States and British Columbia, Canada. To facilitate analysis of grid operations, WECC and its members have defined and numbered a total of 67 major transmission paths in the Western Interconnection. A ''path'' frequently consists of several related transmission elements from one important area of the grid to another, as opposed to a single transmission line.

**Figure IX-1. Congestion on Western Transmission Paths Identified by Others Prior to DOE Congestion Study**




**Congested Transmission Paths**

**Transmission line (or lines).** Solid red or hashed bars "bundle" the lines they cross or touch into a numbered transmission path.

[#] The number alongside each bar is the WECC number for that path.

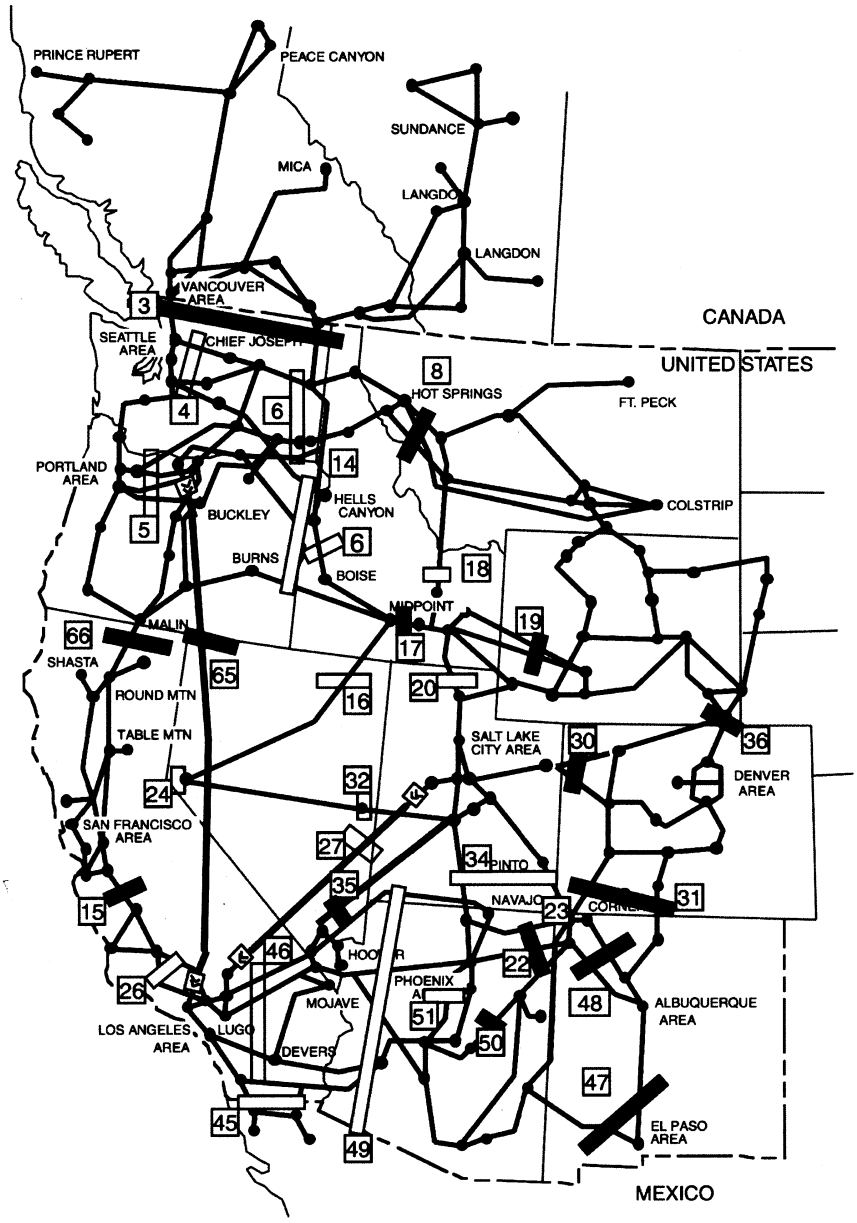
Congestion on the path, based on current or near-term conditions.

Subregional areas with significant existing congestion.

Congestion that would result from future development of generation capacity in the Rocky Mountain area.

Source: DOE Congestion Study, p. 32.

**Figure IX-2. Congestion on Western Transmission Paths As Identified from Historical Data, 1999-2005**




**Transmission line (or lines).** White or colored bars "bundle" the lines they cross or touch into a numbered transmission path.

[#] The number alongside each bar is the WECC number for that path.

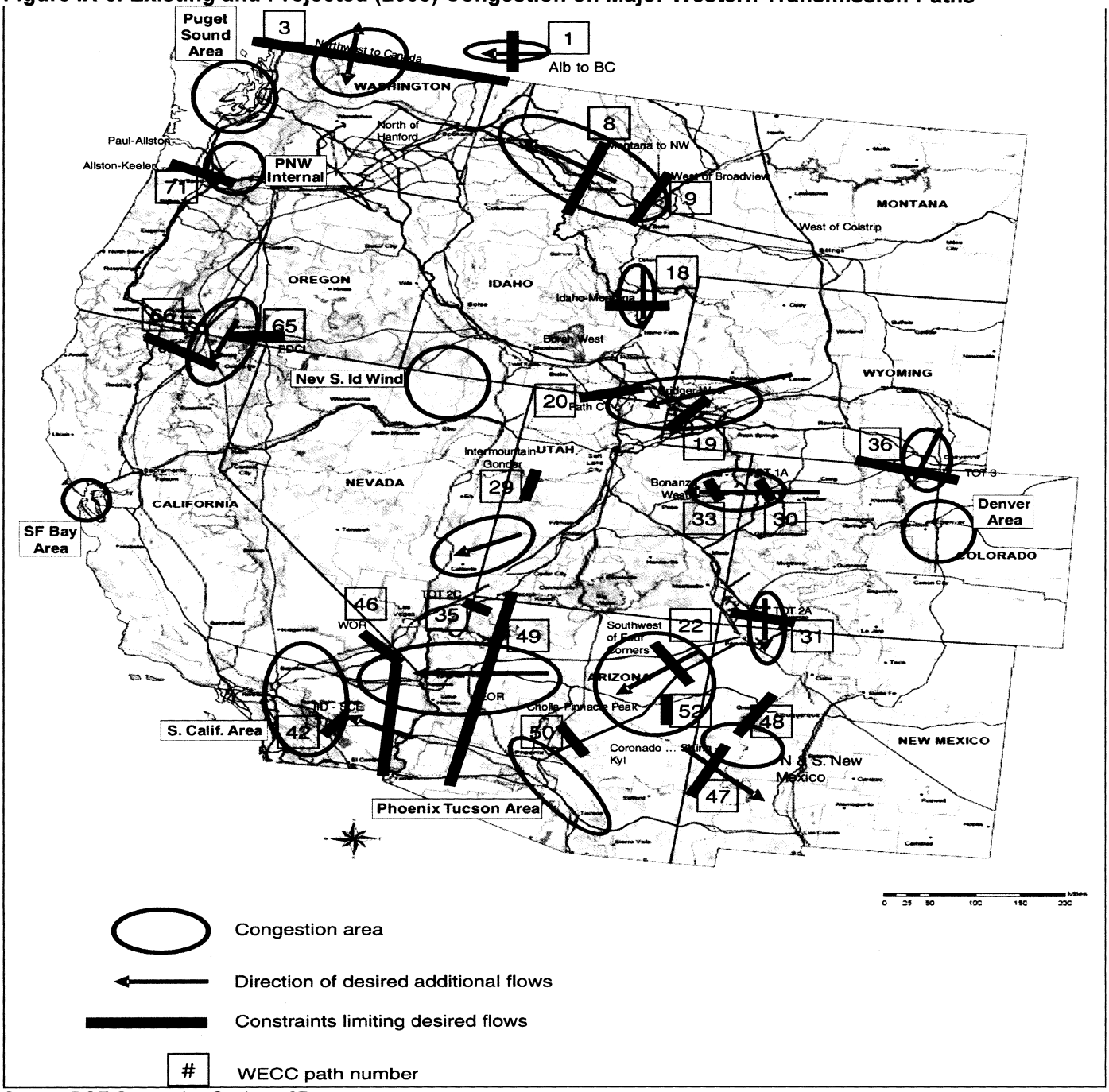
Actual Flow > 75% of OTC greater than 50% of time on path

Actual Flow > 75% of OTC between 25% and 50 % of time on path

Actual Flow > 75% of OTC between 0% and 25% of time on path

Source: DOE Congestion Study, p. 33.

**Figure IX-3. Existing and Projected (2008) Congestion on Major Western Transmission Paths**




Source: DOE Congestion Study, p. 37.

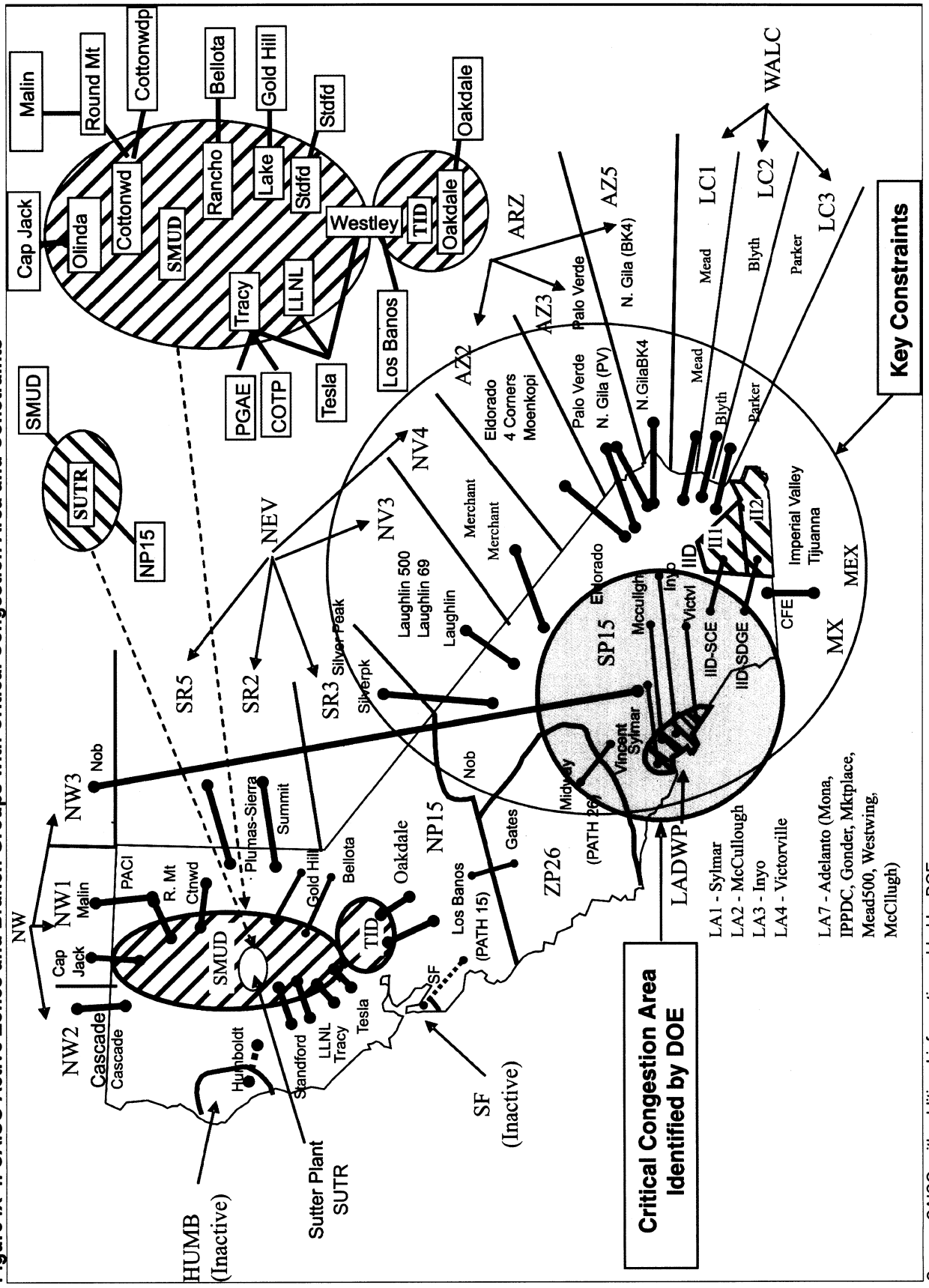



**Figure IX-4. CAISO Active Zones and Branch Groups with Critical Congestion Area and Constraints**

Source: CAISO, with additional information added by DOE.

The historical review performed for the Congestion Study confirmed the presence of congestion in years 1999 through 2005 on Path 26 (Northern—Southern California), Path 45 (San Diego County—Baja California Norte), Path 46

(West of the Colorado River), Path 49 (East of the Colorado River), and Path 65 (Pacific DC Inter-tie). Path 65 exceeded 75 percent of its flow limit 32 percent of the time and Paths 26, 45, and 49 exceeded 75 percent of their flow limits between 15 to18 percent of the time. The modeling performed for the Congestion Study projected that several of these constraints will continue to cause congestion in 2008. These include Paths 42, 45, 49, and 65. Of these, Path 42 IID-SCE (near Riverside, California) had a projected U75 of 84 percent and a projected U90 of 65 percent.

CAISO data document the presence of congestion on paths going into southern California. The CAISO footprint is divided into three zones. Based on the branch groups, CAISO manages congestion into and out of these zones through operation of a day-ahead and an hour-ahead market.[101] At the CAISO branch group level, constraints were binding and thus produced congestion in both markets in calendar years 2004, 2005, and 2006. (See Table IX–1.)

**Table IX-1. Congested Hours and Average Congestion Prices on CAISO Branch Groups into or within Southern California, 2004-2006**

| Cost Category ($/MW) | Day-Ahead Market | | | | | | Hour-Ahead Market | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percentage of Hours Being Congested (%) | | | Average Congestion Price ($/MWh) | | | Percentage of Hours Being Congested (%) | | | Average Congestion Price ($/MWh) | | |
| | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 |
| **ADLANTOSP_BG** | | **10%** | **4%** | | **$17** | **$4** | | | **2%** | | **$53** | **$28** |
| **BLYTHE_BG** | **8%** | **5%** | **4%** | **$77** | **$108** | **$2** | **1%** | | **0%** | **$49** | **$96** | **$10** |
| CFE_BG | | | 0% | | | $0 | | | 0% | $30 | $20 | $0 |
| **ELDORADO_BG** | **3%** | **6%** | **9%** | **$4** | **$9** | **$11** | **4%** | **4%** | **4%** | **$12** | **$13** | **$14** |
| IID-SCE_BG | | 0% | 0% | | $49 | $2 | | | 0% | | $33 | $50 |
| IID-SDGE_BG | | | 0% | | | $30 | | | 0% | | | $30 |
| **MEAD_BG** | **5%** | **8%** | **13%** | **$3** | **$2** | **$4** | **5%** | **4%** | **8%** | **$23** | **$22** | **$20** |
| **NOB_BG** | **12%** | **9%** | **10%** | **$3** | **$2** | **$4** | **7%** | **6%** | **10%** | **$11** | **$17** | **$23** |
| **PALOVRDE_BG** | **22%** | **23%** | **15%** | **$6** | **$6** | **$9** | **7%** | **8%** | **8%** | **$17** | **$20** | **$29** |
| PARKER_BG | 0% | 1% | 4% | $4 | $3 | $3 | 0% | | 0% | $7 | | $20 |
| **PATH26_BG** | **0%** | **0%** | **5%** | **$22** | | **$3** | **0%** | | **4%** | **$35** | **$65** | **$15** |
| SILVERPK_BG | 0% | 0% | 0% | $11 | | $0 | | | 1% | $5 | | $1 |

Notes: Branch groups with congestion in the Day-Ahead market of 5% or more of the hours in a given year are shown in bold. CAISO reports congestion data in both import and export directions. The table above shows values only for flows into Southern California.

Sources: CAISO *Annual Report on Market Issues and Performance*, 2005, 2006, and CAISO database for 2006.

In the day-ahead market, the Adelanto, Blythe, Eldorado, Mead, and Palo Verde branch groups had the most binding hours of all the CAISO branch groups. The Palo Verde and Mead branch groups were the most congested in 2006 with binding hours of 15 and 13 percent respectively. Congestion on Palo Verde, in terms of binding hours, diminished somewhat in 2006 as compared to 2004 and 2005, but the congestion prices increased. On Mead, both binding hours and congestion prices were higher in 2006 than in 2004 and 2005. On Path 26, the congestion price diminished after its capacity limit was raised in late June 2005, but the number of binding hours increased. As shown in Table IX–1, these same branch groups are also congested in CAISO's hour-ahead market. The aggregate annual congestion revenues for several of these branch groups are shown in Table IX–2, and range from $122,000 to $17 million in 2006.

[101] Unlike PJM's and NYISO's LMP day-ahead and hour-ahead markets, energy is not traded in CAISO's day-ahead and hour-ahead markets. Instead, market participants submit desired transmission schedules along with bids for adjusting those schedules. Transactions scheduled over congested inter-zonal interfaces are assessed a congestion charge based on these adjustment bids. The day-ahead and hour-ahead markets do not account for intra-zonal congestion, which CAISO must manage during real-time operations.

**Table IX-2. Congestion Revenue for Selected CAISO Branch Groups, 2004-2006**

| BRANCH_GRP | Day-Ahead Market Congestion Revenue ($) | | | Hour-Ahead Market Congestion Revenue ($) | | | Total Congestion Cost ($)* | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 |
| BLYTHE_BG | 975,233 | 8,747,667 | 112,032 | 12,583 | 757 | 10,574 | 987,816 | 8,748,424 | 122,606 |
| ELDORADO_BG | 1,365,194 | 4,608,008 | 6,650,407 | 301,208 | 134,467 | 25,289 | 1,666,402 | 4,742,475 | 6,675,696 |
| MEAD_BG | 1,116,635 | 1,046,698 | 2,977,319 | 415,245 | 102,866 | 253,438 | 1,531,880 | 1,149,564 | 3,230,757 |
| PALOVRDE_BG | 21,632,116 | 19,665,658 | 16,974,558 | 81,093 | 105,354 | 95,990 | 21,713,209 | 19,771,012 | 17,070,548 |
| PARKER_BG | 7,739 | 28,397 | 158,489 | 10,809 | 2 | 1,887 | 18,548 | 28,399 | 160,376 |
| PATH26_BG | 454,330 | 0 | 3,209,426 | 23,445 | 28,205 | 123,558 | 477,775 | 28,205 | 3,332,984 |

*CAISO reports congestion data for both imports and exports. Values shown above are for flows into Southern California only.

Source: CAISO.

CAISO data also demonstrate the existence of congestion on paths within southern California. When congestion arises in real time within one of the three CAISO zones, CAISO must engage in redispatch. CAISO draws from three sources for this redispatch: Reliability-must-run (RMR) units; [102] long-start thermal units lined up day-ahead in return for minimum load cost compensation (MLCC); and other generators whose bids are accepted out of sequence (OOS). The Department recognizes that the magnitude of RMR, MLCC, and OOS costs is, in part, a function of CAISO's market design, and that CAISO is in the process of replacing its zonal congestion management system with an LMP congestion management system. Nevertheless, RMR, MLCC, and OOS costs are indicators of the presence and persistence of intra-zonal congestion. RMR, MLCC, and OOS costs were incurred in 2004, 2005, and 2006.[103] CAISO states further that ''[m]ost of the major points of intra-zonal congestion in 2005 were located in the CAISO's southern congestion zone (SP15).'' [104]

Data from WAPA also demonstrate that routes into SP15 via the Blythe, Gene, Marketplace, and Mead substations are frequently congested, as indicated by numerous denials of requests to reserve capacity for transfers of power into SP15. (See Table IX–3).

**Table IX-3. Number and Capacity of Reservations Denied between WAPA and Select Points in SP15, 2004-2006**

| | Number of Reservations Denied | | | Capacity of Reservations Denied (MW) | | |
|---|---|---|---|---|---|---|
| | 2004 | 2005 | 2006 | 2004 | 2005 | 2006 |
| Blythe | 2 | 10 | 32 | NA | 184 | 1,653 |
| Gene | 10 | 22 | 4 | NA | 784 | 306 |
| Marketplace | 8 | 3 | 188 | 288 | 109 | 8,366 |
| Mead | 150 | 461 | 289 | 3,324 | 17,866 | 13,051 |

Data source: WAPA.

Thus, the Department has documented the existence of persistent congestion into and within the Southern California Critical Congestion Area, as well as the constraints causing that persistent congestion. As discussed in Section II.A above, whenever there is persistent congestion, buyers must rely on power from less-preferred generating sources, a smaller range of generators is able to serve load, and grid operators have fewer options for dealing with adverse circumstances or unanticipated events, all of which adversely affects consumers. Therefore, the Department finds under FPA section 216(a)(2) that there are ''constraints or congestion that adversely affects consumers'' in the Southern California Critical Congestion Area.

### *C. Determination That Designation of a Southwest Area National Corridor Is Warranted*

Given the presence of constraints or congestion that adversely affects consumers in the Southern California Critical Congestion Area, the Secretary has the discretion to consider designation of a National Corridor. As

[102] RMR units are generally local generators that would otherwise not be commercially viable, but are needed because transmission constraints prevent the use of other generating units. RMR units generally operate subject to cost-of-service contracts that ensure they will remain in business, available to operate when needed.

[103] *See* CAISO, 2006 Annual Report on Market Issues and Performance, p. 6–4, 6–5 (April 2006) (''Total estimated intra-zonal congestion costs for 2004, 2005, and 2006 were $426 million, $222 million, and $207 million, respectively. These costs have been declining over the period due to installation of appropriately located new generation and transmission upgrades.'').

[104] CAISO, 2005 Annual Report on Market Issues and Performance, p. 6–2 (April 2006); *see also* CAISO, 2004 Annual Report on Market Issues and Performance, p. 6–13 (April 2005) (CAISO 2004 Annual Report) (in 2004, ''the bulk of OOS dispatches of incremental energy (96 percent) are for locational constraints within the CAISO's southern zone (SP15)'').

discussed above in Section II.A, the Secretary will determine whether to exercise his discretion based on the totality of the information developed, taking into account relevant considerations, including the considerations identified in FPA section 216(a)(4), as appropriate. In this section, the Department discusses the considerations that it believes warrant designation of the Southwest Area National Corridor.

1. Reliability Considerations

In recent years, southern California's electricity supply capability, combined with what supplies can be imported from external sources, has been barely enough to meet peak electricity demand. In the summer of 2005, CAISO declared two Stage 2 Emergencies in southern California (July 21 and 22) and a transmission emergency occurred on August 25 that resulted in the curtailment of 900 MW of firm load. In the summer of 2006, rolling blackouts were avoided during a period of extremely hot weather only through a combination of good fortune, extraordinary efforts by the utilities, CAISO, and the Bonneville Power Administration, and timely cooperation by electricity consumers to reduce electricity demand.

In its comments to DOE, CAISO noted that load in southern California has been growing at a rate of approximately 1.5 percent annually, which translates into a total of approximately 657 MW of new load that needs to be served each year. CAISO notes that this rate of load growth, combined with the threat of extreme weather conditions, such as a 1-in-10-year heat wave, could mean that by 2015, the loss of a single critical transmission path could necessitate the curtailment of approximately 1,500 MW of load. CAISO notes that the San Diego area is projected to be deficient in overall generation capacity by the year 2010 due to severe import limits. CAISO also notes looming reliability problems on the South of Lugo path, a major CAISO internal path that serves the Los Angeles Basin. CAISO states that in the event of a double-line contingency on that path at peak load, anywhere from 500 to 1,000 MW of load would need to be curtailed.

Since submission of its comments on the Congestion Study, CAISO has published additional analyses that identify potential reliability problems in southern California. In its assessment for the summer of 2007, CAISO concludes that there is a 23 percent chance of entering into a Stage 1 emergency in the area south of Path 26 (SP26), and a 12 percent chance of entering into a Stage 2 emergency.[105] Further, according to CAISO's 2007 Transmission Plan, a number of transmission enhancements are needed in the Devers area to mitigate existing or projected reliability violations.[106]

Similarly, LADWP stated in its comments to the Department that ''Zone SP26 is a large load center that is currently experiencing reliability problems because of transmission constraints. * * * Zone SP26 will likely continue its dependence on imports, so transmission improvements are needed to avoid future violations of reliability standards. * * *''

In its comments to DOE, SDG&E described the San Diego area's situation as follows:

> The San Diego region has only two points of interconnection to the interstate electric transmission grid: A 500 kV line at SDG&E's Miguel substation that delivers power from the east, and a series of 230 kV lines connecting at the San Onofre Nuclear Generating Station (''SONGS'') switchyard to the north. Taken together, these two paths are capable of serving only a portion of the peak-load requirements of the SDG&E local reliability area. Neither of these paths is capable of serving the full peak-load requirements of the SDG&E local reliability area if the other is out of service. In fact, these two paths are barely sufficient to serve the average load of the region. As a result of growing loads in southern California, coupled with the addition of new generation in the desert southwest, the import capability into the San Diego area is often fully utilized.
>
> To put the San Diego constraints in perspective, there are more than forty-five 500 kV transmission lines in the state of California. The two major utilities serving the Los Angeles area have more than thirty 500 kV AC transmission lines as well as two +/−500 kV DC lines. Phoenix, America's sixth largest city, has eight 500 kV transmission lines and six 345 kV transmission lines. By comparison, among the large electric service areas in the State and the west, San Diego is extremely under-served in terms of high voltage access to the rest of the grid. [footnotes omitted]

The data detailed above indicate that consumers in the Southern California Critical Congestion Area face threats to reliability if existing congestion problems are not addressed. Reliable electricity supplies are vital to the economic and social well-being of any metropolitan area. Electricity supply disruptions may come in many forms, ranging from brief disturbances in power quality and localized outages to large-scale, cascading blackouts. The exact cost of electric supply disruptions is difficult to quantify and varies depending upon the specific circumstances. However, such disruptions can impose enormous costs on consumers and may also, under certain circumstances, pose dangers to public health and safety.

For example, on Saturday, August 10, 1996, a blackout affected several western States, including much of California, for several hours. CEC conducted a survey to gauge the effects and implications of the blackout. The outage affected slightly less than half of California's residential electricity customers, 20 percent of the commercial customers, and 25 percent of the industrial customers. Forty-one percent of the commercial respondents and 31 percent of the industrial respondents said that the outage was ''very disruptive'' to their operations. The losses reported ranged from $40 to $5 million.[107]

Another California analysis provides further insights:

> Blackouts impose a wide range of costs on the economy, but these costs are incredibly difficult to quantify. The primary costs are direct and roughly proportional to the duration of the outage and the amount of undelivered power, including lost production and idled labor. Frequently, however, actual losses are much greater than this. For example, when production systems are shut down, it can take hours or days to restart them and return to full productivity. Often, information technology equipment and even basic manufacturing equipment is damaged when power is suddenly lost; and industries dependent on climate control (from bioscience labs to supermarkets) are threatened with damaged research or spoiled goods. Finally, power interruptions frequently result in lost data, which can be costly and sometimes impossible to reproduce.
>
> Loss of power can also impose longer-term costs by damaging external relationships and customer interactions. For example, a power interruption for an internet-based business can compromise security and harm its reputation, leading to lower sales in the future * * *. For a brick-and-mortar business, inadequate lighting and lack of power to security systems increase the potential likelihood of vandalism and theft. Loss of climate control and telecommunications capabilities makes it especially difficult for restaurants and retail establishments to attract and retain customers. However, all of these factors still only point to direct costs. Indirect costs multiply the impact several times over as the effects of a power interruption ripple through the economy; for example, lost sales by a

[105] CAISO, 2007 Summer Loads and Resources Operations Assessment, p. 3 (March 7, 2007).

[106] CAISO, 2007 Transmission Plan, Table 2–4, item 7; Table 2–5, item 8; and Table 2–6, items 1 and 3 (Jan. 2007).

[107] CEC, A Survey of the Implications to California of the August 10, 1996 Western States Power Outage, p. 43 (June 1997).

retailer can lead to reduced orders to suppliers, and so forth.[108]

Further, one of the considerations identified in FPA section 216(a)(4) is whether ''the economic vitality and development of the corridor, or the end markets served by the corridor, may be constrained by *lack of adequate* or reasonably priced electricity.'' FPA section 216(a)(4)(A); 16 U.S.C. 824p(a)(4)(A) (emphasis added).

Therefore, the Department believes that reliability considerations warrant designation of a National Corridor for the Southern California Critical Congestion Area.

2. Supply Diversity Considerations

Much of the existing generation fleet on which southern California relies is fueled by natural gas. During 2005, about 38 percent of the electricity generated within California was produced from units fueled by natural gas, as compared with 20 percent from coal, 17 percent from large hydro, and 14 percent from nuclear.[109] California's total annual consumption of natural gas, approximately 2.2 trillion cubic feet, would make this State the tenth largest natural-gas consuming ''country'' in the world. The State's industrial and electricity-generation sectors consume the most natural gas, approximately 66 percent of the total amount. Natural gas used for electricity generation is the largest contributor to the State's growing demand rate, one percent per year.[110] One of the consequences of congestion in southern California is that it prolongs and exacerbates the area's dependence on natural gas.

Natural gas is relatively high in price and must be purchased in markets that are highly volatile and subject to unanticipated international trends and adverse events. Inadequate transmission capacity leaves consumers in the Southern California Critical Congestion Area exposed, perhaps increasingly, to the higher prices and higher price volatility associated with this generation fuel, with a resulting impact on business certainty, especially for industrial consumers. Thus, economic growth may be jeopardized.

Moreover, the Department takes note that CPUC has adopted an interim Emissions Performance Standard, which is a facility-based emissions standard requiring that all new long-term commitments for base-load generation to serve California consumers be with power plants that have emissions no greater than a combined cycle gas turbine plant. In addition, the State of California has established standards requiring load-serving entities to meet 20 percent of their electricity needs through renewable-based generation capacity (wind, geothermal, and solar) by 2010, and 33 percent by 2020. In order to meet these goals and to provide for steady economic growth, consumers in the Southern California Critical Congestion Area will need additional transmission access to a range of sources of supply, particularly renewable energy.

Further, one of the considerations identified in FPA section 216(a)(4) is whether ''(i) economic growth in the corridor, or the end markets served by the corridor, may be jeopardized by reliance on limited sources of energy; and (ii) a diversification of supply is warranted.'' FPA section 216(a)(4)(B); 16 U.S.C. 824p(a)(4)(B).

Therefore, the Department believes that supply diversity considerations warrant designation of a National Corridor for the Southern California Critical Congestion Area.

3. National Defense and Homeland Security Considerations

The Southern California Critical Congestion Area is home to 20.7 million people (7.0 percent of the Nation's 2005 population) [111] and produces about $950 billion of gross state product (7.7 percent of the 2005 gross national product).[112] Given the large number of military and other facilities in the Southern California Critical Congestion Area that are extremely important to the national defense and homeland security, as well as the vital importance of this populous area to the Nation as an economic center, any deterioration of the electric reliability or economic health of this area would constitute a serious risk to the well-being of the Nation. Further one of the consideration identified in FPA section 216(a)(4) is whether ''the designation would enhance national defense and homeland security.'' FPA section 216(a)(4)(E); 16 U.S.C. 824p(a)(4)(E).

Therefore, the Department believes that national defense and homeland security considerations warrant designation of a National Corridor for the Southern California Critical Congestion Area.

*D. Boundaries of the Draft Southwest Area National Corridor*

In this section, the Department first explains how it determined the general extent of the draft Southwest Area National Corridor using a source-and-sink approach. Then, the Department explains how it delineated specific boundaries for the draft Southwest Area National Corridor.

1. General Extent of the Draft Southwest Area National Corridor

In order to set the boundaries of the draft Southwest Area National Corridor, DOE used the general source-and-sink approach described above in Section III. The sink areas are the locations of the consumers adversely affected by the persistent congestion documented in Section IX.B above. Specifically, the sink areas are the urban areas downstream of the constraints identified in Section IX.B above, including the cities of Los Angeles, San Bernardino, Riverside, Anaheim, San Diego, and other nearby municipalities.

With regard to selecting source areas, as discussed in Section III above, the Department was guided by the considerations identified in FPA section 216(a)(4). In particular, the Department focused on the considerations of ensuring adequate supplies of power [113] and diversifying supply.[114] Applying those considerations, DOE identified as source areas locations with substantial amounts of existing, under-used generation capacity (see Table IX–4), and locations with potential for substantial development of wind, geothermal, or solar generation capacity.[115] The existing, under-used generation could readily provide additional power to the sink areas if the required transmission capacity were available. In addition, improved transmission access to the areas with renewable-based generation potential would diversify supply. Figure IX–5 indicates the locations of the source

[108] Bay Area Economic Forum, The Bay Area— A Knowledge Economy Needs Power, pp. 25–26 (April 2001).

[109] CEC Report, Net System Power: A Small Share of California's Power Mix in 2005, Pub. No. CEC–300–2006–009–F, p. 4 (April 2006).

[110] CEC Staff Report, Natural Gas Assessment Update: Executive Summary, Pub. No. CEC–600–2005–003, p. iv (Feb. 2005).

[111] U.S. Census Bureau, State & County QuickFacts, *http://quickfacts.census.gov/qfd/states/00000.html* and *http://quickfacts.census.gov/qfd/states/06/06073.html.*

[112] *See* Northwest Midwest Institute, Total Gross State Product by State, 2001–2005, *http://www.nemw.org/gsp.htm.* Total gross state product attributable to southern California in 2005 was estimated by prorating the State total for 2005 according to the estimated 2005 population in seven California counties: Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, and San Diego.

[113] *See* FPA sec. 216(a)(4)(A).

[114] *See* FPA sec. 216(a)(4)(B).

[115] The potential wind, geothermal, and solar generation capacity used to establish the source areas was identified through State-level maps of potential wind, geothermal, and solar resources. Those maps are provided in Appendix B, which is available at *http://nietc.anl.gov.*

areas in southern California and western Arizona.

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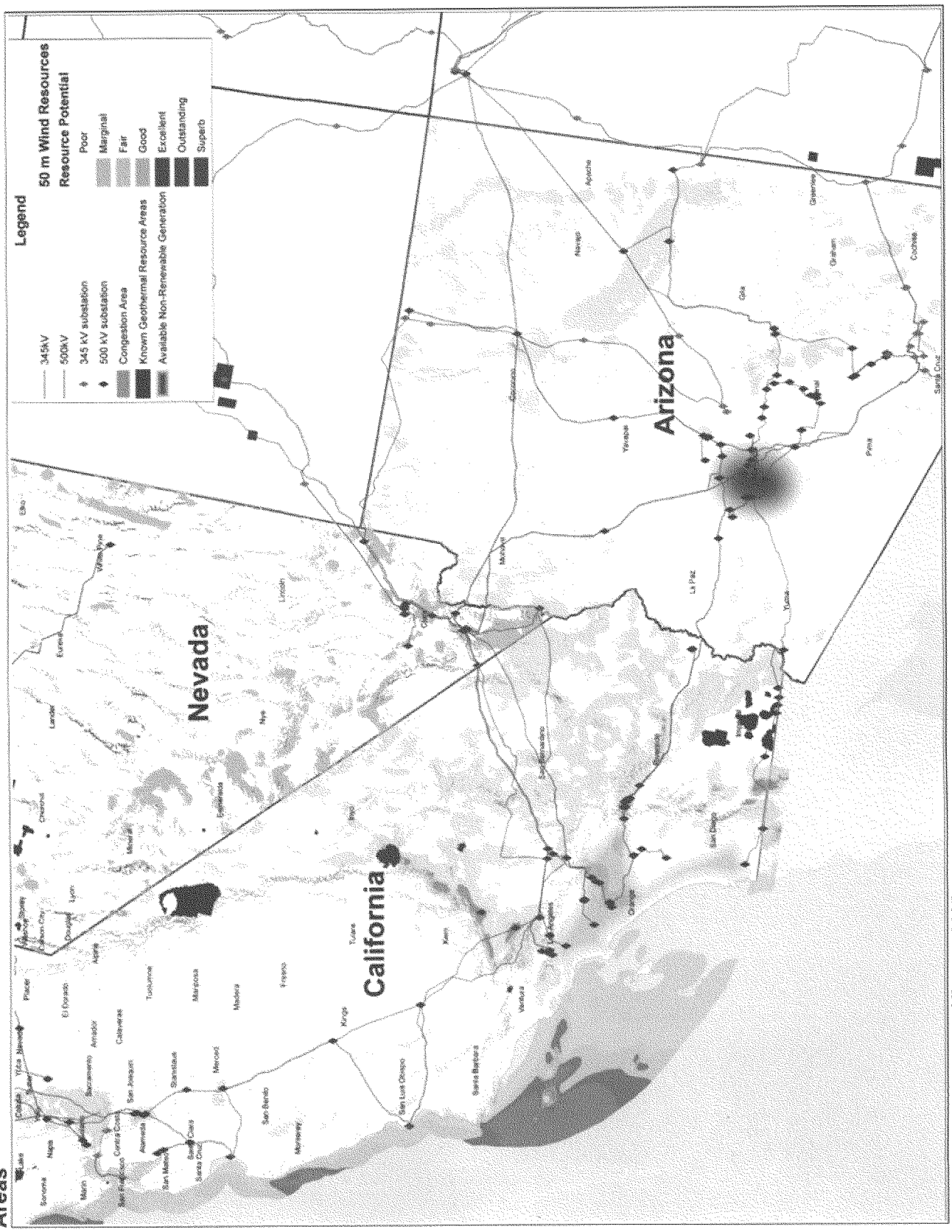
**Table IX-4. Comparison of Capacity Factors for Selected Recently-Constructed Gas-Fired Combined-Cycle Plants in Arizona and California, July and December 2005**

| Plant Name | Capacity Factor, July 2005 | Capacity Factor, December 2005 |
|---|---|---|
| **Arizona Plants** | | |
| Desert Basin Power | 63.1% | 43.1% |
| Griffith Energy | 58.9% | 19.0% |
| Mesquite Gen. Station | 85.9% | 80.8% |
| Red Hawk | 67.7% | 32.3% |
| South Point Energy Center | 81.5% | 33.3% |
| West Phoenix | 59.8% | 25.8% |
| **California Plants** | | |
| Delta Energy Center | 90.6% | 94.7% |
| Elk Hills Power | 96.8% | 99.4% |
| High Desert Power Project | 59.6% | 38.7% |
| Los Medanos Energy Ctr | 77.0% | 83.0% |
| Sunrise Power Co | 70.5% | 75.8% |
| Sutter Energy Center | 48.5% | 66.3% |
| Valley (CA) | 57.2% | 53.5% |

Data source: U.S. EPA CEMS, CEMS Hourly Unit Generation & Emissions Expanded.

**Figure IX-5. Southern California Critical Congestion Area and Potential Gas-fired, Wind and Geothermal Generation Source Areas**




Source: U.S. Department of Energy, 2007.

Having identified the source and sink areas, DOE sought to delineate a draft National Corridor that would connect those areas, encompass all of the relevant constraints contributing to congestion in southern California, and

encompass a range of potential transmission projects and a range of potential routes. The Department is also including the sink areas in the draft Southwest Area National Corridor, because it is frequently the case that local upgrades to the transmission system and related facilities are needed in such areas in order to achieve the full benefits of developing major new high-voltage transmission lines. Further, the Department has included the source areas in the draft Southwest Area National Corridor.

Finally, the draft Southwest Area National Corridor includes the several substations and related transmission facilities between Los Angeles and the Hoover Dam area southeast of Las Vegas, Nevada. This area and the area around Palo Verde, Arizona are the two principal portals from the east for transferring bulk power into southern California. From both a transmission planning perspective and an operational perspective, it is useful to think of these two pathways as closely related. Adding facilities or changing the operating rules on one is almost certain to require changes in the other so as to maintain an appropriate balance between them.[116]

2. Specific Boundaries of the Draft Southwest Area National Corridor

After determining the general area to be covered by the draft National Corridor, DOE addressed the question of establishing its specific boundaries. DOE relied on county boundaries to determine the perimeter of the draft Southwest Area National Corridor. That is, if a portion of the general area identified in Section IX.D.1 above (i.e., the source areas, the sink areas, and the areas in between encompassing the constraints of concern) is located within a county, then the entire county is assumed to be within the draft National Corridor, and the outer perimeter of the group of counties thus identified defines the draft National Corridor as whole. This approach establishes boundaries that are precise and identifiable. Moreover, this approach helps ensure that the draft National Corridor encompasses a range of potential projects and a range of potential routes, as discussed in Section III above. The resulting draft Southwest Area National Corridor is shown in Figure IX–6.

[116] For example, CAISO states that the Southern California Import Transmission (SCIT) operating nomogram: Places limits on imports into southern California based on a variety of conditions. They include power flows on five major paths into southern California, actual flow East of the River (EOR), and system inertia from generation within southern California. When the SCIT nomogram becomes binding, the CAISO must increment additional generation from a limited number of units in southern California to mitigate flows. Intra-zonal congestion initiating the SCIT nomogram often is due to the large quantity of low cost energy from imports from Arizona or Mexico being used to serve southern California load.

CAISO 2004 Annual Report, p. 6–3.

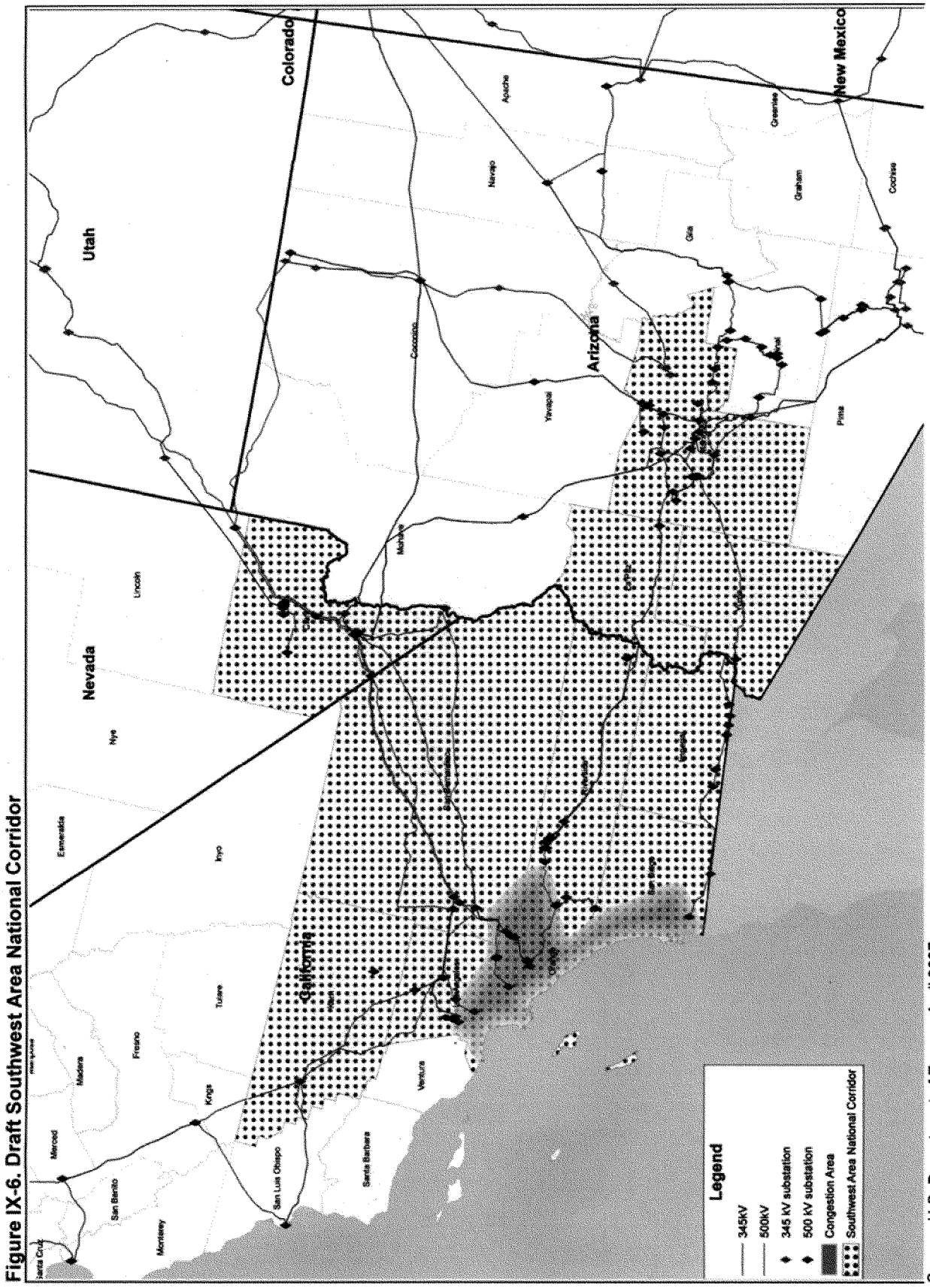



Figure IX-6. Draft Southwest Area National Corridor

Source: U.S. Department of Energy, April 2007.

The counties that comprise the draft Southwest Area National Corridor are as follows:

California

Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, and San Diego.

Arizona

La Paz, Maricopa, and Yuma.

Nevada

Clark.

The Secretary of Energy has approved the publication of this notice.

Issued in Washington, DC, on April 25, 2007.

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