

SECTION 7 – CONGESTION

Congestion occurs when available, least-cost energy cannot be delivered to all loads for a period because transmission facilities are not adequate to deliver that energy. When the least-cost available energy cannot be delivered to load in a transmission-constrained area, higher cost units in the constrained area must be dispatched to meet that load.¹ The result is that the price of energy in the constrained area is higher than in the unconstrained area because of the combination of transmission limitations and the cost of local generation. Locational marginal prices (LMPs) reflect the price of the lowest-cost resources available to meet loads, taking into account actual delivery constraints imposed by the transmission system. Thus LMP is an efficient way to price energy when transmission constraints exist. Congestion reflects this efficient pricing.

Congestion reflects the underlying characteristics of the power system including the nature and capability of transmission facilities and the cost and geographical distribution of generation facilities. Congestion is neither good nor bad but is a direct measure of the extent to which there are differences in the cost of generation that cannot be equalized because of transmission constraints. A complete set of markets would require direct competition between investments in transmission and generation. The transmission system provides a physical hedge against congestion. The transmission system is paid for by firm load and, as a result, firm load receives the corollary financial hedge in the form of Auction Revenue Rights (ARRs) and/or Financial Transmission Rights (FTRs). While the transmission system and, therefore, ARRs/FTRs are not guaranteed to be a complete hedge against congestion, ARRs/FTRs do provide a substantial offset to the cost of congestion to firm load.²

The Market Monitoring Unit (MMU) analyzed congestion and its influence on PJM markets during 2009.

Overview

Congestion Cost

- **Total Congestion.** Total congestion costs decreased by \$1.397 billion or 66 percent, from \$2.117 billion in 2008 to \$719.0 million in 2009. Day-ahead congestion costs decreased by \$1.760 billion or 66 percent, from \$2.661 billion in 2008 to \$901.4 million in 2009. Balancing congestion costs increased by \$362.2 million or 67 percent, from -\$544.6 million in 2008 to -\$182.4 million in 2009. Total congestion costs have ranged from three percent to nine percent of PJM annual total billings since 2003. Congestion costs were three percent of total PJM billings in 2009. Total PJM billings in 2009 were \$26.550 billion, a 23 percent decrease from the \$34.306 billion billed in 2008.

¹ This is referred to as dispatching units out of economic merit order. Economic merit order is the order of all generator offers from lowest to highest cost. Congestion occurs when loadings on transmission facilities mean the next unit in merit order cannot be used and a higher cost unit must be used in its place.

² See the 2009 State of the Market Report for PJM, Volume II, Section 8, "Financial Transmission and Auction Revenue Rights," at "ARR and FTR Revenue and Congestion."

- **Monthly Congestion.** Fluctuations in monthly congestion costs continued to be substantial. In 2009, these differences were driven by varying load and energy import levels, different patterns of generation, weather-induced changes in demand and variations in congestion frequency on constraints affecting large portions of PJM load. Monthly congestion costs in 2009 ranged from \$23.9 million in September to \$149.3 million in January. With the exception of December, monthly congestion costs decreased every month from the previous year with the largest decrease occurring during June 2009.

Congestion Component of LMP and Facility or Zonal Congestion

- **Congestion Component of Locational Marginal Price (LMP).** To provide an indication of the geographic dispersion of congestion costs, the congestion component of LMP (CLMP) was calculated for control zones in PJM. Price separation between eastern, southern and western control zones in PJM was primarily a result of congestion on the AP South interface. This interface had the effect of increasing prices in eastern and southern control zones located on the constrained side of the affected facilities while reducing prices in the unconstrained western control zones.
- **Congested Facilities.** Congestion frequency continued to be significantly higher in the Day-Ahead Market than in the Real-Time Market in 2009.³ Day-ahead congestion frequency increased from 2008 to 2009 by 3,048 congestion event hours or four percent. In 2009, there were 77,793 day-ahead, congestion-event hours compared to 74,745 day-ahead, congestion-event hours in 2008. Day-ahead, congestion-event hours increased on PJM transmission lines and the reciprocally coordinated flowgates between PJM and the Midwest Independent Transmission System Operator, Inc. (Midwest ISO) while congestion frequency on internal PJM interfaces and transformers decreased. Real-time congestion frequency decreased from 2008 to 2009 by 6,995 congestion event hours. In 2009, there were 15,454 real-time, congestion-event hours compared to 22,449 real-time, congestion-event hours in 2008. Real-time, congestion-event hours increased on the reciprocally coordinated flowgates between PJM and the Midwest ISO, while interfaces, transmission lines and transformers saw decreases. The AP South interface was the largest contributor to congestion costs in 2009. With \$206.5 million in total congestion costs, it accounted for 29 percent of the total PJM congestion costs in 2009. The top five constraints in terms of congestion costs together contributed \$361.9 million, or 50 percent, of the total PJM congestion in 2009. The top five constraints included the AP South Interface, the West Interface, the 5004/5005 Interface, the Pleasant Valley – Belvidere line and the Kammer transformer.

³ In the 2008 and in the 2009 *State of the Market Report for PJM*, in order to have a consistent metric for real-time and day-ahead congestion frequency, real-time congestion frequency is measured using the convention that an hour is constrained if any of its component five-minute intervals is constrained. Comparisons to previous periods use the new standard for both current and prior periods.

- **Zonal Congestion.** In 2009, the ComEd Control Zone experienced the highest congestion costs of the control zones in PJM. However, in 2009, the average congestion component of LMP in ComEd was -\$5.09 for day-ahead and -\$5.61 for real time. The negative congestion components in ComEd resulted in -\$262.8 million in load congestion payments, -\$487.0 million in generation congestion credits, and -\$4.5 million in explicit congestion charges. The net positive congestion number in ComEd is an example of how accounting congestion can be a misleading measure of congestion when it results from generation congestion credits which are more negative than load congestion payments. In fact, congestion reduces prices in ComEd, and load incurs lower charges and generation receives lower credits as a result. The \$219.7 million in net congestion costs in the ComEd Control Zone represented a 22.7 percent decrease from the \$284.2 million in congestion costs the zone experienced in 2008. The Pleasant Valley – Belvidere line, the Dunes Acres – Michigan City flowgate, the Kammer transformer, the East Frankfort – Crete line, and the AP South interface contributed \$113.3 million, or 52 percent of the total ComEd Control Zone congestion costs (Table 7-45). The Dominion Control Zone had the second highest congestion cost in PJM in 2009. The \$112.9 million in congestion costs in the Dominion Control Zone represented a 65 percent decrease from the \$322.6 million in congestion costs the zone had experienced in 2008. The AP South interface contributed \$69.0 million, or 61 percent of the total Dominion Control Zone congestion cost.

Economic Planning Process

- **Transmission and Markets.** As a general matter, transmission investments have not been fully incorporated into competitive markets. The construction of new transmission facilities can have significant impacts on energy and capacity markets, but there is no market mechanism in place that would require direct competition between transmission and generation to meet loads in an area. While the RPM construct does provide that qualifying transmission upgrades may be submitted as offers, there have been no such offers. More generally, network transmission is not built based directly on market signals because the owners of network transmission are compensated through a non market mechanism, typically under traditional regulation. PJM has taken a first step towards integrating transmission investments into the market through the use of economic evaluation metrics. Economic evaluation metrics can be used to determine whether there are positive economic benefits associated with an investment in transmission that might warrant the investment even when it is not required for reliability. The goal of transmission planning should ultimately be the incorporation of transmission investment decisions into market driven processes as much as possible.
- **Process Revision.** After multiple filings in a proceeding concerning PJM's proposed economic metrics for evaluating transmission investments (Docket No. ER06-1474), the United States Federal Energy Regulatory Commission (FERC) approved in early 2009 an approach with predefined formulas for determining whether a transmission investment passes the cost-benefit test including explicit accounting for changes in production costs, the costs of complying with environmental regulations, generation availability trends and demand-response trends.⁴

⁴ 126 FERC ¶ 61,152.

Conclusion

Congestion reflects the underlying characteristics of the power system, including the nature and capability of transmission facilities, the cost and geographical distribution of generation facilities and the geographical distribution of load. Total congestion costs decreased by \$1.397 billion or 66 percent, from \$2.117 billion in 2008 to \$719.0 million in 2009. Day-ahead congestion costs decreased by \$1.760 billion or 66 percent, from \$2.661 billion in 2008 to \$901.4 million in 2009. Balancing congestion costs increased by \$362.2 million or 67 percent, from -\$544.6 million in 2008 to -\$182.4 million in 2009. Congestion costs were significantly higher in the Day-Ahead Market than in the balancing market. Congestion frequency was also significantly higher in the Day-Ahead Market than in the Real-Time Market. Day-ahead congestion frequency increased from 2008 to 2009 by 3,048 congestion event hours. In 2009, there were 77,793 day-ahead, congestion-event hours compared to 74,745 day-ahead, congestion-event hours in 2008. Real-time congestion frequency decreased from 2008 to 2009 by 6,995 congestion event hours. In 2009, there were 15,454 real-time, congestion-event hours compared to 22,449 real-time, congestion-event hours in 2008.

ARRs and FTRs served as an effective, but not total, hedge against congestion. ARR and FTR revenues hedged more than 100 percent of the total congestion costs in the Day-Ahead Energy Market and the balancing energy market within PJM for the 2008 to 2009 planning period. For the first seven months of the 2009 to 2010 planning period, ARR and FTR revenue hedged 94 percent of the total congestion costs within PJM.⁵ FTRs were paid at 100 percent of the target allocation for the 2008 to 2009 planning year and 98 percent of the target allocation level for the first seven months of the 2009 to 2010 planning period. Revenue adequacy for a planning period is not final until the end of the period.

There are other ways to evaluate the effectiveness of ARRs as a hedge. The value of ARRs and ARRs converted to self scheduled FTRs was 3.5 percent of total energy charges to load for the first three quarters of 2009. FTRs acquired through FTR auctions had a net negative value, probably largely as a result of lower than expected congestion.

One constraint accounted for over a quarter of total congestion costs in 2009 and the top five constraints accounted for half of total congestion costs. The AP South interface was the largest contributor to congestion costs in 2009.

The congestion metric requires careful review. Net congestion, which includes both load congestion payments and generation congestion credits, is not a good measure of the congestion costs paid by load from the perspective of the wholesale market.⁶ While total congestion costs represent the overall charge or credit to a zone, the components of congestion costs measure the extent to which load or generation bear total congestion costs. Load congestion payments, when positive, measure the total congestion cost to load in an area. Load congestion payments, when negative, measure the total congestion credit to load in an area. Negative load congestion payments result when load is on the lower priced side of a constraint or constraints. For example, congestion across the AP South interface means lower prices in western control zones and higher prices in eastern and

⁵ See the 2009 State of the Market Report for PJM, Volume II, Section 8, "Financial Transmission and Auction Revenue Rights," at Table 8-28, "ARR and FTR congestion hedging: Planning periods 2008 to 2009 and 2009 to 2010."

⁶ The actual congestion payments by retail customers are a function of retail ratemaking policies and may or may not reflect an offset for congestion credits.

southern control zones. Load in western control zones will benefit from lower prices and receive a congestion credit (negative load congestion payment). Load in the eastern and southern control zones will incur a congestion charge (positive load congestion payment). The reverse is true for generation congestion credits. Generation congestion credits, when positive, measure the total congestion credit to generation in an area. Generation congestion credits, when negative, measure the total congestion cost to generation in an area. This is a cost only in the sense that revenues to generators in the area are lower, by the amount of the congestion cost, than they would have been if they had been paid LMP without a congestion component, the system marginal price. Negative generation congestion credits result when generation is on the lower priced side of a constraint or constraints. For example, congestion across the AP South interface means lower prices in the western control zones and higher prices in the eastern and southern control zones. Generation in the western control zones will receive lower prices and incur a congestion charge (negative generation congestion credit). Generation in the eastern and southern control zones will receive higher prices and receive a congestion credit (positive generation congestion credit).

As an example, total congestion costs in PJM for 2009 were \$719.0 million, which was comprised of load congestion payments of \$253.3 million, negative generation credits of \$515.1 million and negative explicit congestion of \$49.4 million (see Table 7-2).

Congestion

Congestion Accounting

Transmission congestion can exist in PJM's Day-Ahead and Real-Time Energy Market. Transmission congestion charges in the Day-Ahead Energy Market can be directly hedged by FTRs. Balancing market congestion charges can be hedged by FTRs to the extent that a participant's energy flows in real time are consistent with those in the Day-Ahead Energy Market.⁷

Total congestion charges are equal to the net congestion bill plus explicit congestion charges, incurred in both the Day-Ahead Energy Market and the balancing energy market.

The net congestion bill is calculated by subtracting generating congestion credits from load congestion payments. The logic is that increased congestion payments by load are offset by increased congestion revenues to generation, for the area analyzed. Whether the net congestion bill is an appropriate measure of congestion for load depends on who pays the load congestion payments and who receives the generation congestion credits. The net congestion bill is an appropriate measure of congestion for a utility that charges load congestion payments to load and credits generation congestion credits to load. The net congestion bill is not an appropriate measure of congestion in situations where load pays the load congestion payments but does not receive the generation credits as an offset.

In the 2009 analysis of total congestion costs, load congestion payments are netted against generation congestion credits on an hourly basis, by billing organization, and then summed for

⁷ The terms *congestion charges* and *congestion costs* are both used to refer to the costs associated with congestion. The term, *congestion charges*, is used in documents by PJM's Market Settlement Operations.

the given period.⁸ A billing organization may offset load congestion payments with its generation portfolio or by purchasing supply from another entity via a bilateral transaction.

Load Congestion Payments and Generation Congestion Credits are calculated for both the Day-Ahead and Balancing Energy Markets.

- **Day-Ahead Load Congestion Payments.** Day-ahead load congestion payments are calculated for all cleared demand, decrement bids and Day-Ahead Energy Market sale transactions. (Decrement bids and energy sales can be thought of as scheduled load.) Day-ahead load congestion payments are calculated using MW and the load bus CLMP, the decrement bid CLMP or the CLMP at the source of the sale transaction, as applicable.
- **Day-Ahead Generation Congestion Credits.** Day-ahead generation congestion credits are calculated for all cleared generation and increment offers and Day-Ahead Energy Market purchase transactions. (Increment offers and energy purchases can be thought of as scheduled generation.) Day-ahead generation congestion credits are calculated using MW and the generator bus CLMP, the increment offer's CLMP or the CLMP at the sink of the purchase transaction, as applicable.
- **Balancing Load Congestion Payments.** Balancing load congestion payments are calculated for all deviations between a PJM member's real-time load and energy sale transactions and their day-ahead cleared demand, decrement bids and energy sale transactions. Balancing load congestion payments are calculated using MW deviations and the real-time CLMP for each bus where a deviation exists.
- **Balancing Generation Congestion Credits.** Balancing generation congestion credits are calculated for all deviations between a PJM member's real-time generation and energy purchase transactions and the day-ahead cleared generation, increment offers and energy purchase transactions. Balancing generation congestion credits are calculated using MW deviations and the real-time CLMP for each bus where a deviation exists.
- **Explicit Congestion Charges.** Explicit congestion charges are the net congestion charges associated with point-to-point energy transactions. These charges equal the product of the transacted MW and CLMP differences between sources (origins) and sinks (destinations) in the Day-Ahead Energy Market. Balancing energy market explicit congestion charges equal the product of the deviations between the real-time and day-ahead transacted MW and the differences between the real-time CLMP at the transactions' sources and sinks.

The congestion charges associated with specific constraints are the sum of the total day-ahead and balancing congestion costs associated with those constraints. The congestion charges in each zone are the sum of the congestion charges associated with each constraint that affects prices in the zone. The network nature of the transmission system means that congestion costs in a zone are frequently the result of constrained facilities located outside that zone.

⁸ This analysis does not treat affiliated billing organizations as a single organization. Thus, the generation congestion credits from one organization will not offset the load payments of its affiliate. This may overstate or understate the actual load payments or generation credits of an organization's parent company.

Congestion costs can be both positive and negative. The CLMP is calculated with respect to the system reference bus LMP, also called the system marginal price (SMP). When a transmission constraint occurs, the resulting CLMP is positive on one side of the constraint and negative on the other side of the constraint and the corresponding congestion costs are positive or negative. For each transmission constraint, the CLMP reflects the cost of a constraint at a pricing node and is equal to the product of the constraint shadow price and the distribution factor at the respective pricing node. The total CLMP at a pricing node is the sum of all constraint contributions to LMP and is equal to the difference between the actual LMP that results from transmission constraints, excluding losses, and the SMP. If an area experiences lower prices because of a constraint, the CLMP in that area is negative.⁹

Total Calendar Year Congestion

Congestion charges have ranged from 3 percent to 9 percent of annual total PJM billings since 2003.¹⁰ Table 7-1 shows total congestion by year from 2003 through 2009. Total congestion charges were \$719 million in calendar year 2009, a 66 percent decrease from \$2.117 billion in calendar year 2008.¹¹

Table 7-1 Total annual PJM congestion (Dollars (Millions)): Calendar years 2003 to 2009

	Congestion Charges	Percent Change	Total PJM Billing	Percent of PJM Billing
2003	\$464	NA	\$6,900	7%
2004	\$750	62%	\$8,700	9%
2005	\$2,092	179%	\$22,630	9%
2006	\$1,603	(23%)	\$20,945	8%
2007	\$1,846	15%	\$30,556	6%
2008	\$2,117	15%	\$34,306	6%
2009	\$719	(66%)	\$26,550	3%
Total	\$9,591		\$150,587	6%

Total congestion charges appearing in Table 7-1 include both congestion charges associated with PJM facilities and those associated with reciprocal, coordinated flowgates in the Midwest ISO whose operating limits are respected by PJM.¹²

Table 7-2 shows the 2009 PJM congestion costs by category. The 2009 PJM total congestion costs were comprised of \$253.3 million load congestion payments, \$515.1 million negative generation congestion credits, and \$49.4 million negative explicit congestion costs. Load payments

⁹ For an example of the congestion accounting methods used in this section, see the 2009 State of the Market Report for PJM, Volume II, Appendix G, "Financial Transmission and Auction Revenue Rights," at Table G-1, "Congestion revenue, FTR target allocations and FTR congestion credits: Illustration."

¹⁰ Calculated values shown in Section 7, "Congestion," are based on unrounded, underlying data and may differ from calculations based on the rounded values in the tables.

¹¹ PJM reports congestion in terms of revenue collected to fund FTR Target Allocations. This means that any hour that results in a net negative congestion cost (i.e. the sum of day-ahead and balancing congestion costs in a given hour is less than zero) is excluded from the total congestion cost calculation for a given period. Therefore, the total congestion costs reported here will be less than those reported by PJM, for the same period, because they include the net negative congestion costs.

¹² See "Joint Operating Agreement Between the Midwest Independent Transmission System Operator, Inc. And PJM Interconnection, L.L.C." (December 11, 2008) (Accessed February 19, 2010), Section 6.1 <<http://www.pjm.com/documents/agreements/-/media/documents/agreements/joa-complete.ashx>>.

for congestion decreased by 76 percent while generation credits for congestion increased by 53 percent and explicit congestion decreased by 59 percent.

Table 7-2 Total annual PJM congestion costs by category (Dollars (Millions)): Calendar years 2008 and 2009

Year	Congestion Costs (Millions)			Total
	Load Payments	Generation Credits	Explicit	
2008	\$1,060.2	(\$1,087.5)	(\$31.1)	\$2,116.6
2009	\$253.3	(\$515.1)	(\$49.4)	\$719.0

Monthly Congestion

Table 7-3 shows that during calendar year 2009, monthly congestion charges ranged from a maximum of \$149.3 million in January 2009 to a minimum of \$23.9 million in September 2009. Approximately 26 percent of all calendar year 2009 congestion occurred between the months of May and August.

Table 7-3 Monthly PJM congestion charges (Dollars (Millions)): Calendar years 2008 to 2009

	2008	2009	Change
Jan	\$231.0	\$149.3	(\$81.7)
Feb	\$168.1	\$83.0	(\$85.1)
Mar	\$86.4	\$74.6	(\$11.8)
Apr	\$126.2	\$25.6	(\$100.5)
May	\$182.8	\$25.9	(\$157.0)
Jun	\$436.4	\$49.8	(\$386.7)
Jul	\$359.8	\$39.4	(\$320.4)
Aug	\$127.4	\$72.1	(\$55.3)
Sep	\$124.8	\$23.9	(\$100.9)
Oct	\$102.2	\$42.7	(\$59.5)
Nov	\$93.0	\$36.3	(\$56.7)
Dec	\$78.4	\$96.4	\$18.0
Total	\$2,116.6	\$719.0	(\$1,397.6)

Congestion Component of LMP

The congestion component of LMP was calculated for each PJM control zone, to provide an indication of the geographic dispersion of congestion costs. The congestion component of LMP for control zones is presented in Table 7-4 for calendar years 2008 and 2009.

Table 7-4 shows overall congestion patterns in 2009. Price separation between eastern and western control zones in PJM was primarily a result of congestion on the AP South interface. This constraint

generally had a positive congestion component of LMP in eastern and southern control zones located on the constrained side of the affected facilities while the unconstrained western zones had a negative congestion component of LMP.

Table 7-4 Annual average congestion component of LMP: Calendar years 2008 to 2009

Control Zone	2008		2009	
	Day Ahead	Real Time	Day Ahead	Real Time
AECO	\$7.93	\$10.77	\$2.03	\$1.83
AEP	(\$9.56)	(\$10.46)	(\$2.12)	(\$2.16)
AP	(\$0.50)	\$0.29	\$0.62	\$1.32
BGE	\$10.96	\$11.06	\$3.33	\$3.04
ComEd	(\$11.37)	(\$13.46)	(\$5.09)	(\$5.61)
DAY	(\$10.04)	(\$11.18)	(\$2.77)	(\$2.72)
DLCO	(\$11.77)	(\$14.47)	(\$3.37)	(\$3.02)
Dominion	\$8.07	\$8.76	\$2.47	\$2.37
DPL	\$7.63	\$7.69	\$2.25	\$2.32
JCPL	\$7.92	\$8.64	\$1.82	\$2.01
Met-Ed	\$6.59	\$6.51	\$2.10	\$2.03
PECO	\$5.93	\$6.11	\$1.87	\$1.71
PENELEC	(\$0.91)	(\$2.33)	(\$0.10)	(\$0.06)
Pepco	\$12.28	\$12.40	\$3.75	\$3.74
PPL	\$5.62	\$5.50	\$1.88	\$1.75
PSEG	\$7.76	\$8.92	\$2.12	\$2.27
RECO	\$6.55	\$7.62	\$1.47	\$1.55

Congested Facilities

A congestion event exists when a unit or units must be dispatched out-of-merit order to control the impact of a contingency on a monitored facility or to control an actual overload. A congestion-event hour exists when a specific facility is constrained for one or more five-minute intervals within an hour. A congestion-event hour differs from a constrained hour, which is any hour during which one or more facilities are congested. Thus, if two facilities are constrained during an hour, the result is two congestion-event hours and one constrained hour. Constraints are often simultaneous, so the number of congestion-event hours exceeds the number of constrained hours and the number of congestion-event hours can exceed the number of hours in a year. In order to have a consistent metric for real-time and day-ahead congestion frequency, real-time congestion frequency is measured using the convention that an hour is constrained if any of its component five-minute intervals is constrained. This is also consistent with the way in which PJM reports real-time congestion. In 2009, there were 77,793 day-ahead, congestion-event hours compared to 74,745 day-ahead, congestion-event hours in 2008. In 2009, there were 15,454 real-time, congestion-event hours compared to 22,449 real-time, congestion-event hours in 2008.

Congestion by Facility Type and Voltage

Day-ahead, congestion-event hours increased on PJM transmission lines and on the reciprocally coordinated flowgates between PJM and the Midwest Independent Transmission System Operator, Inc. (Midwest ISO) while congestion frequency on internal PJM interfaces and transformers decreased. Real-time, congestion-event hours increased on the reciprocally coordinated flowgates between PJM and the Midwest ISO, while interfaces, transmission lines and transformers saw decreases.

Day-ahead congestion costs increased on the reciprocally coordinated flowgates between PJM and the Midwest ISO and decreased on all other facility types in 2009. Balancing congestion costs decreased on the reciprocally coordinated flowgates between PJM and the Midwest ISO and increased on all other facility types in 2009.

Table 7-5 provides congestion-event-hour subtotals and congestion cost subtotals comparing 2009 calendar year results by facility type: line, transformer, interface, flowgate and unclassified facilities.^{13,14} For comparison, this information is presented in Table 7-6 for calendar year 2008.¹⁵

Total congestion costs associated with the reciprocally coordinated flowgates between PJM and the Midwest ISO increased by \$33.2 million from -\$19.9 million in 2008 to \$13.3 million in 2009.¹⁶ The Dunes Acres – Michigan City flowgate accounted for \$16.7 million in congestion costs and was the largest contributor to positive congestion costs among flowgates in 2009. The largest contribution to negative congestion costs among flowgates came from the Pana North flowgate with -\$8.9 million in 2009 congestion costs.

Total congestion costs associated with interfaces decreased from \$937.4 million in 2008 to \$322.8 million in 2009. Interfaces typically include multiple transmission facilities and reflect power flows into or through a wider geographic area. Interface congestion constituted 45 percent of total PJM congestion costs in 2009. Among interfaces, the AP South, the West and the 5004/5005 interfaces accounted for the largest contribution to positive congestion costs in 2009. The AP South interface, with \$206.5 million in congestion, had the highest congestion cost of any facility in PJM, accounting for 29 percent of the total PJM congestion costs in 2009. The AP South, the West and the 5004/5005 interfaces together accounted for \$293.8 million or 41 percent of total PJM congestion costs in 2009.

Total congestion costs associated with transmission lines decreased 66 percent from \$837.4 million in 2008 to \$281.0 million in 2009. Transmission line congestion accounted for 40 percent of the total PJM congestion costs for 2009. The Pleasant Valley – Belvidere and Mount Storm – Pruntytown lines together accounted for \$54.7 million or 19 percent of all transmission line congestion costs and were the largest contributors to positive congestion among transmission lines in 2009. The

¹³ Unclassified constraints appear in the Day-Ahead Market only and represent congestion costs incurred on market elements which are not posted by PJM. Congestion frequency associated with these unclassified constraints is not presented in order to be consistent with the posting of constrained facilities by PJM.

¹⁴ The term *flowgate* refers to Midwest ISO flowgates in this context.

¹⁵ For 2008 and 2009, the load congestion payments and generation congestion credits represent the net load congestion payments and net generation congestion credits for an organization, as this shows the extent to which each organization's load or generation was exposed to congestion costs.

¹⁶ The congestion costs reported here for the reciprocally coordinated flowgates between PJM and the Midwest ISO flowgates are calculated in the same manner as all other internal PJM constraints and use the congestion accounting methods defined in this section. For the payments to and from the Midwest ISO based on the market-to-market settlement calculations, defined in the "Joint Operating Agreement between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C.," see the 2009 State of the Market Report for PJM, Volume II, Section 4, "Interchange Transactions," at "PJM and Midwest ISO Joint Operating Agreement."

largest contribution to negative congestion costs among transmission lines came from the Crete – East Frankfurt line with -\$8.0 million in 2009 congestion costs.

Total congestion costs associated with transformers decreased 69 percent from \$338.9 million in 2008 to \$103.6 million in 2009. Congestion on transformers accounted for 14 percent of the total PJM congestion costs in 2009. The Kammer and Doubs transformers together accounted for \$59.1 million or 57 percent of all transformer congestion costs and were the largest contributors to positive congestion costs among transformers in 2009.

Table 7-5 Congestion summary (By facility type): Calendar year 2009

Type	Congestion Costs (Millions)									Event Hours	
	Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
Flowgate	\$18.0	(\$56.3)	\$17.8	\$92.1	(\$10.4)	\$5.1	(\$63.2)	(\$78.8)	\$13.3	9,202	3,328
Interface	\$48.0	(\$263.5)	\$2.1	\$313.5	\$4.0	(\$2.4)	\$2.9	\$9.3	\$322.8	5,802	1,378
Line	\$114.8	(\$195.8)	\$41.1	\$351.6	(\$18.8)	\$11.8	(\$40.1)	(\$70.7)	\$281.0	52,236	7,619
Transformer	\$108.5	(\$14.6)	\$22.9	\$145.9	(\$13.8)	(\$4.4)	(\$32.9)	(\$42.3)	\$103.6	10,553	3,129
Unclassified	\$3.1	\$4.9	\$0.0	(\$1.7)	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.7)	NA	NA
Total	\$292.3	(\$525.2)	\$83.9	\$901.4	(\$39.0)	\$10.1	(\$133.4)	(\$182.4)	\$719.0	77,793	15,454

Table 7-6 Congestion summary (By facility type): Calendar year 2008

Type	Congestion Costs (Millions)									Event Hours	
	Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
Flowgate	\$9.6	(\$14.3)	\$11.8	\$35.7	(\$7.2)	\$3.5	(\$44.8)	(\$55.5)	(\$19.9)	2,417	2,073
Interface	\$368.3	(\$579.2)	\$44.7	\$992.2	(\$18.2)	\$20.3	(\$16.3)	(\$54.8)	\$937.4	8,866	2,263
Line	\$597.5	(\$423.0)	\$120.0	\$1,140.6	(\$129.1)	\$27.6	(\$146.4)	(\$303.1)	\$837.4	50,640	13,231
Transformer	\$300.4	(\$139.7)	\$29.9	\$470.0	(\$71.4)	\$27.8	(\$32.0)	(\$131.2)	\$338.9	12,822	4,882
Unclassified	\$10.3	(\$10.5)	\$2.0	\$22.8	\$0.0	\$0.0	\$0.0	\$0.0	\$22.8	NA	NA
Total	\$1,286.1	(\$1,166.7)	\$208.4	\$2,661.2	(\$225.9)	\$79.2	(\$239.5)	(\$544.6)	\$2,116.6	74,745	22,449

Table 7-7 shows congestion costs by facility voltage class for 2009. In comparison to 2008 (shown in Table 7-8), congestion costs decreased across 765 kV, 500 kV, 230 kV, 138 kV, 115 kV, 34 kV, 12 kV and unclassified facilities in 2009. Congestion costs increased across 345 kV facilities in 2009.

Congestion costs associated with 765 kV facilities decreased 99 percent from \$4.9 million in 2008 to the \$0.1 million experienced in 2009. Congestion on 765 kV facilities comprised less than 1 percent of total 2009 PJM congestion costs.

Congestion costs associated with 500 kV facilities decreased 73 percent from \$1.528 billion in 2008, to \$407 million in 2009. Congestion on 500 kV facilities comprised 57 percent of total 2009

PJM congestion costs. The AP South interface, the West interface, the 5004/5005 interface and the Kammer transformer accounted for \$327.8 million or 81 percent of all 500 kV congestion costs; they were the largest contributors to positive congestion among 500 kV facilities in 2009.

Congestion costs associated with 345 kV facilities increased by 2,090 percent from -\$2.9 million in 2008, to \$58.1 million in 2009. Congestion on 345 kV facilities comprised eight percent of total 2009 PJM congestion costs. The East Frankfurt – Crete line and the Crete – St. Johns line accounted for \$40.0 million or 69 percent of all 345 kV congestion costs; they were the largest contributors to positive congestion among 345 kV facilities in 2009.

Congestion costs associated with 230 kV facilities decreased 66 percent from \$243.1 million in 2008 to \$83.2 million in 2009. Congestion on 230 kV facilities comprised 12 percent of total 2009 PJM congestion costs. The Doubs transformer accounted for \$25.1 million or 30 percent of all 230 kV congestion costs and was the largest contributor to positive congestion among 230 kV facilities in 2009.

Congestion costs associated with 138 kV facilities decreased 38 percent from \$257.3 million in 2008 to \$158.3 million in 2009. Congestion on 138 kV facilities comprised 22 percent of total 2009 PJM congestion costs. The Pleasant Valley – Belvidere line and Dunes Acres – Michigan City flowgate together accounted for \$50.9 million or 32 percent of all 138 kV congestion costs; they were the largest contributors to positive congestion among 138 kV facilities in 2009.

Congestion costs associated with 115 kV facilities decreased by 67 percent from \$36.3 million in 2008, to \$12.1 million in 2009. Congestion on 115 kV facilities comprised two percent of total 2009 PJM congestion costs. The Seward transformer and the Beechwood – Kerr Dam line together accounted for \$5.5 million or 45 percent of all 115 kV congestion costs; they were the largest contributors to positive congestion among 115 kV facilities in 2009.

Congestion costs associated with 69 kV and below facilities decreased by nearly 100 percent from \$50.5 million in 2008, to \$0.2 million in 2009. Congestion on 69 kV and below facilities comprised less than one percent of total 2009 PJM congestion costs. The Short – Laurel line accounted for -\$2.4 million in congestion costs. It had the largest contribution to congestion costs among 69 kV and below facilities.

Table 7-7 Congestion summary (By facility voltage): Calendar year 2009

Congestion Costs (Millions)											
Voltage (kV)	Day Ahead				Balancing				Grand Total	Event Hours	
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
765	(\$0.0)	(\$0.0)	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	24	0
500	\$115.0	(\$275.8)	\$14.2	\$404.9	(\$0.5)	(\$15.0)	(\$12.3)	\$2.1	\$407.0	11,571	3,301
345	\$30.6	(\$61.4)	\$34.8	\$126.8	(\$5.3)	\$7.1	(\$56.3)	(\$68.7)	\$58.1	8,396	2,506
230	\$56.3	(\$45.4)	\$9.5	\$111.2	(\$15.0)	\$5.9	(\$7.2)	(\$28.0)	\$83.2	15,030	2,095
138	\$68.2	(\$147.7)	\$24.9	\$240.7	(\$14.8)	\$10.4	(\$57.2)	(\$82.5)	\$158.3	30,328	6,669
115	\$11.6	(\$0.7)	\$0.4	\$12.6	\$0.4	\$0.6	(\$0.2)	(\$0.5)	\$12.1	4,892	552
69	\$7.3	\$0.7	\$0.2	\$6.8	(\$3.8)	\$0.9	(\$0.1)	(\$4.8)	\$1.9	6,420	329
34	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	181	2
12	\$0.4	\$0.3	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	951	0
Unclassified	\$3.1	\$4.9	\$0.0	(\$1.7)	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.7)	NA	NA
Total	\$292.3	(\$525.2)	\$83.9	\$901.4	(\$39.0)	\$10.1	(\$133.4)	(\$182.4)	\$719.0	77,793	15,454

Table 7-8 Congestion summary (By facility voltage): Calendar year 2008

Congestion Costs (Millions)											
Voltage (kV)	Day Ahead				Balancing				Grand Total	Event Hours	
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
765	\$1.6	(\$3.0)	\$0.1	\$4.7	\$1.2	\$0.5	(\$0.4)	\$0.2	\$4.9	83	31
500	\$718.1	(\$861.2)	\$90.1	\$1,669.4	(\$98.5)	(\$0.7)	(\$44.1)	(\$141.9)	\$1,527.5	19,171	7,185
345	\$52.9	(\$62.6)	\$46.7	\$162.2	(\$38.6)	\$8.0	(\$118.6)	(\$165.1)	(\$2.9)	5,887	2,627
230	\$213.8	(\$106.8)	\$28.8	\$349.4	(\$33.9)	\$49.7	(\$22.7)	(\$106.3)	\$243.1	14,816	4,058
138	\$191.9	(\$121.0)	\$39.1	\$351.9	(\$38.5)	\$8.5	(\$47.7)	(\$94.7)	\$257.3	20,551	6,478
115	\$62.9	(\$4.5)	\$1.4	\$68.8	(\$15.4)	\$11.4	(\$5.7)	(\$32.5)	\$36.3	8,046	1,475
69	\$34.7	\$3.0	\$0.4	\$32.0	(\$2.3)	\$1.8	(\$0.2)	(\$4.3)	\$27.7	6,191	571
34	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	0	24
12	(\$0.0)	(\$0.1)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	0	0
Unclassified	\$10.3	(\$10.5)	\$2.0	\$22.8	\$0.0	\$0.0	\$0.0	\$0.0	\$22.8	NA	NA
Total	\$1,286.1	(\$1,166.7)	\$208.4	\$2,661.2	(\$225.9)	\$79.2	(\$239.5)	(\$544.6)	\$2,116.6	74,745	22,449

Constraint Duration

Table 7-9 lists calendar year 2008 and 2009 constraints that were most frequently in effect and Table 7-10 shows the constraints which experienced the largest change in congestion-event hours from 2008 to 2009.¹⁷

The Kammer transformer, the AP South interface and the Pleasant Valley – Belvidere line were the most frequently occurring constraints in 2009. The Pleasant Valley – Belvidere line saw the largest increase in congestion-event hours from 2008. The Cloverdale – Lexington line saw the largest decrease in congestion-event hours from 2008 to 2009, but still remained in the top 25 of the most frequently occurring transmission constraints. The Kammer transformer, the AP South interface and the Pleasant Valley – Belvidere line were also among the top contributors to 2009 congestion costs (see Table 7-11).

Table 7-9 Top 25 constraints with frequent occurrence: Calendar years 2008 to 2009

No.	Constraint	Type	Event Hours						Percent of Annual Hours					
			Day Ahead			Real Time			Day Ahead			Real Time		
			2008	2009	Change	2008	2009	Change	2008	2009	Change	2008	2009	Change
1	Kammer	Transformer	3,069	3,674	605	1,628	1,328	(300)	35%	42%	7%	19%	15%	(3%)
2	AP South	Interface	3,572	3,501	(71)	1,016	604	(412)	41%	40%	(1%)	12%	7%	(5%)
3	Pleasant Valley - Belvidere	Line	5	3,648	3,643	15	405	390	0%	42%	42%	0%	5%	4%
4	Leonia - New Milford	Line	919	3,847	2,928	84	39	(45)	10%	44%	33%	1%	0%	(1%)
5	Dunes Acres - Michigan City	Flowgate	687	2,949	2,262	435	910	475	8%	34%	26%	5%	10%	5%
6	Burlington - Croydon	Line	549	2,794	2,245	10	3	(7)	6%	32%	26%	0%	0%	(0%)
7	East Frankfort - Crete	Line	1,002	2,134	1,132	0	0	0	11%	24%	13%	0%	0%	0%
8	Crete - St Johns Tap	Flowgate	84	1,565	1,481	14	306	292	1%	18%	17%	0%	3%	3%
9	Tiltonsville - Windsor	Line	0	1,449	1,449	10	311	301	0%	17%	17%	0%	4%	3%
10	Waterman - West Dekalb	Line	178	1,499	1,321	1	57	56	2%	17%	15%	0%	1%	1%
11	Cloverdale - Lexington	Line	3,529	1,015	(2,514)	1,813	434	(1,379)	40%	12%	(29%)	21%	5%	(16%)
12	State Line - Wolf Lake	Flowgate	1,342	1,261	(81)	370	183	(187)	15%	14%	(1%)	4%	2%	(2%)
13	Oak Grove - Galesburg	Flowgate	0	754	754	12	638	626	0%	9%	9%	0%	7%	7%
14	Pana North	Flowgate	190	986	796	640	318	(322)	2%	11%	9%	7%	4%	(4%)
15	Athenia - Saddlebrook	Line	227	1,108	881	120	139	19	3%	13%	10%	1%	2%	0%
16	Cedar Grove - Clifton	Line	793	1,194	401	445	38	(407)	9%	14%	5%	5%	0%	(5%)
17	Pinehill - Stratford	Line	3,088	1,208	(1,880)	0	0	0	35%	14%	(21%)	0%	0%	0%
18	Glidden - West Dekalb	Line	10	1,166	1,156	0	21	21	0%	13%	13%	0%	0%	0%
19	Pumphrey - Westport	Line	1,092	1,181	89	0	0	0	12%	13%	1%	0%	0%	0%
20	5004/5005 Interface	Interface	736	776	40	449	294	(155)	8%	9%	0%	5%	3%	(2%)
21	Kammer - Ormet	Line	196	552	356	151	509	358	2%	6%	4%	2%	6%	4%
22	Bellehaven - Tasley	Line	96	1,055	959	0	0	0	1%	12%	11%	0%	0%	0%
23	Electric Jct - Nelson	Line	0	823	823	50	202	152	0%	9%	9%	1%	2%	2%
24	Ruth - Turner	Line	0	704	704	20	313	293	0%	8%	8%	0%	4%	3%
25	Deepcreek	Transformer	0	951	951	0	0	0	0%	11%	11%	0%	0%	0%

¹⁷ Presented in descending order of absolute change between 2008 and 2009 day-ahead and real-time, congestion-event hours.

Table 7-10 Top 25 constraints with largest year-to-year change in occurrence: Calendar years 2008 to 2009

No.	Constraint	Type	Event Hours						Percent of Annual Hours					
			Day Ahead			Real Time			Day Ahead			Real Time		
			2008	2009	Change	2008	2009	Change	2008	2009	Change	2008	2009	Change
1	Pleasant Valley - Belvidere	Line	5	3,648	3,643	15	405	390	0%	42%	42%	0%	5%	4%
2	Cloverdale - Lexington	Line	3,529	1,015	(2,514)	1,813	434	(1,379)	40%	12%	(29%)	21%	5%	(16%)
3	Leonia - New Milford	Line	919	3,847	2,928	84	39	(45)	10%	44%	33%	1%	0%	(1%)
4	Dunes Acres - Michigan City	Flowgate	687	2,949	2,262	435	910	475	8%	34%	26%	5%	10%	5%
5	Mount Storm - Pruntytown	Line	2,559	525	(2,034)	812	132	(680)	29%	6%	(23%)	9%	2%	(8%)
6	Sammis - Wylie Ridge	Line	1,915	762	(1,153)	1,257	157	(1,100)	22%	9%	(13%)	14%	2%	(13%)
7	Burlington - Croydon	Line	549	2,794	2,245	10	3	(7)	6%	32%	26%	0%	0%	(0%)
8	Trainer - Delco Tap	Line	2,218	0	(2,218)	0	0	0	25%	0%	(25%)	0%	0%	0%
9	Pinehill - Stratford	Line	3,088	1,208	(1,880)	0	0	0	35%	14%	(21%)	0%	0%	0%
10	Crete - St Johns Tap	Flowgate	84	1,565	1,481	14	306	292	1%	18%	17%	0%	3%	3%
11	Tiltonsville - Windsor	Line	0	1,449	1,449	10	311	301	0%	17%	17%	0%	4%	3%
12	Atlantic - Larrabee	Line	1,556	280	(1,276)	380	73	(307)	18%	3%	(15%)	4%	1%	(3%)
13	West	Interface	1,690	504	(1,186)	390	87	(303)	19%	6%	(13%)	4%	1%	(3%)
14	Oak Grove - Galesburg	Flowgate	0	754	754	12	638	626	0%	9%	9%	0%	7%	7%
15	Waterman - West Dekalb	Line	178	1,499	1,321	1	57	56	2%	17%	15%	0%	1%	1%
16	Branchburg - Readington	Line	1,121	37	(1,084)	271	13	(258)	13%	0%	(12%)	3%	0%	(3%)
17	Glidden - West Dekalb	Line	10	1,166	1,156	0	21	21	0%	13%	13%	0%	0%	0%
18	Mount Storm	Transformer	935	151	(784)	469	80	(389)	11%	2%	(9%)	5%	1%	(4%)
19	East Frankfort - Crete	Line	1,002	2,134	1,132	0	0	0	11%	24%	13%	0%	0%	0%
20	East Towanda	Transformer	803	0	(803)	306	0	(306)	9%	0%	(9%)	3%	0%	(3%)
21	Krendale - Seneca	Line	1,389	324	(1,065)	24	0	(24)	16%	4%	(12%)	0%	0%	(0%)
22	Ruth - Turner	Line	0	704	704	20	313	293	0%	8%	8%	0%	4%	3%
23	Bedington	Transformer	1,192	354	(838)	303	149	(154)	14%	4%	(10%)	3%	2%	(2%)
24	Dickerson - Pleasant View	Line	844	54	(790)	218	30	(188)	10%	1%	(9%)	2%	0%	(2%)
25	Electric Jct - Nelson	Line	0	823	823	50	202	152	0%	9%	9%	1%	2%	2%

Constraint Costs

Table 7-11 and Table 7-12 present the top constraints affecting congestion costs by facility for calendar years 2008 and 2009.¹⁸ The AP South interface was the largest contributor to congestion costs in 2009. With \$206.5 million in total congestion costs, it accounted for 29 percent of the total PJM congestion costs in 2009. The top five constraints in terms of congestion costs together comprised 50 percent of the total PJM congestion costs in 2009.

Table 7-11 Top 25 constraints affecting annual PJM congestion costs (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)								Percent of Total PJM Congestion Costs		
				Day Ahead				Balancing					Grand Total	2009
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	AP South	Interface	500	\$12.0	(\$186.0)	(\$0.2)	\$197.8	\$2.9	(\$2.9)	\$2.9	\$8.7	\$206.5	29%	
2	West	Interface	500	\$19.4	(\$22.9)	\$0.7	\$42.9	\$0.4	(\$0.3)	\$0.1	\$0.8	\$43.7	6%	
3	5004/5005 Interface	Interface	500	\$11.1	(\$31.0)	\$0.3	\$42.4	\$1.3	\$0.3	\$0.2	\$1.1	\$43.6	6%	
4	Pleasant Valley - Belvidere	Line	ComEd	(\$6.3)	(\$45.2)	\$4.0	\$42.9	(\$0.6)	\$2.9	(\$5.3)	(\$8.8)	\$34.2	5%	
5	Kammer	Transformer	500	\$50.8	\$16.1	\$9.0	\$43.8	(\$4.9)	(\$6.7)	(\$11.6)	(\$9.8)	\$34.0	5%	
6	East Frankfort - Crete	Line	ComEd	\$5.9	(\$19.1)	\$8.6	\$33.6	\$0.0	\$0.0	\$0.0	\$0.0	\$33.6	5%	
7	Doubs	Transformer	AP	\$17.6	(\$10.8)	\$0.9	\$29.3	(\$2.1)	\$0.2	(\$1.8)	(\$4.2)	\$25.1	3%	
8	Mount Storm - Pruntytown	Line	AP	\$1.8	(\$16.8)	\$0.5	\$19.1	\$0.9	(\$1.7)	(\$1.1)	\$1.5	\$20.5	3%	
9	Bedington - Black Oak	Interface	500	\$3.8	(\$15.5)	\$0.8	\$20.1	(\$0.4)	(\$0.1)	\$0.1	(\$0.2)	\$19.8	3%	
10	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$13.5	(\$23.2)	\$8.6	\$45.4	(\$7.2)	(\$2.0)	(\$23.4)	(\$28.6)	\$16.7	2%	
11	Cloverdale - Lexington	Line	AEP	\$8.1	(\$5.3)	\$2.0	\$15.3	(\$0.0)	(\$3.1)	(\$2.8)	\$0.3	\$15.6	2%	
12	Crete - St Johns Tap	Flowgate	Midwest ISO	\$3.2	(\$15.1)	\$3.8	\$22.0	(\$1.1)	\$0.4	(\$6.1)	(\$7.7)	\$14.4	2%	
13	AEP-DOM	Interface	500	\$1.4	(\$7.6)	\$0.5	\$9.5	(\$0.5)	(\$0.2)	(\$0.0)	(\$0.3)	\$9.2	1%	
14	Pana North	Flowgate	Midwest ISO	\$0.1	(\$2.2)	\$1.8	\$4.2	(\$0.5)	\$1.1	(\$11.5)	(\$13.0)	(\$8.9)	(1%)	
15	Graceton - Raphael Road	Line	BGE	\$1.5	(\$6.0)	\$0.6	\$8.1	\$1.5	\$0.1	(\$0.7)	\$0.7	\$8.8	1%	
16	Tiltonsville - Windsor	Line	AP	\$8.4	(\$0.4)	\$0.3	\$9.1	(\$0.4)	(\$0.6)	(\$0.7)	(\$0.6)	\$8.6	1%	
17	Ruth - Turner	Line	AEP	\$2.5	(\$6.5)	\$0.5	\$9.5	(\$1.5)	(\$0.6)	(\$0.6)	(\$1.5)	\$8.0	1%	
18	Crete - East Frankfurt	Line	ComEd	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.0)	\$1.3	(\$5.7)	(\$8.0)	(\$8.0)	(1%)	
19	Sammis - Wylie Ridge	Line	AP	\$4.5	(\$3.5)	\$3.5	\$11.5	(\$1.1)	(\$0.2)	(\$2.8)	(\$3.7)	\$7.8	1%	
20	Kanawha River	Transformer	AEP	\$2.0	(\$3.7)	\$0.3	\$6.0	\$0.1	(\$0.5)	(\$0.1)	\$0.5	\$6.5	1%	
21	Kammer - Ormet	Line	AEP	\$4.3	(\$4.1)	(\$0.1)	\$8.3	(\$1.6)	\$0.5	(\$0.0)	(\$2.2)	\$6.2	1%	
22	Glidden - West Dekalb	Line	ComEd	(\$0.6)	(\$6.0)	\$0.4	\$5.9	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$6.0	1%	
23	Breed - Wheatland	Line	AEP	(\$0.2)	(\$5.2)	\$0.6	\$5.6	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	\$5.6	1%	
24	Kanawha - Kincaid	Line	AEP	\$1.9	(\$3.5)	\$0.2	\$5.6	\$0.0	\$0.0	\$0.0	\$0.0	\$5.6	1%	
25	Schahfer - Burr Oak	Flowgate	Midwest ISO	\$0.4	(\$1.3)	\$0.6	\$2.3	(\$2.0)	\$0.4	(\$5.4)	(\$7.8)	(\$5.6)	(1%)	

¹⁸ Presented in descending order of annual total congestion costs.

Table 7-12 Top 25 constraints affecting annual PJM congestion costs (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)								Percent of Total PJM Congestion Costs 2008	
				Day Ahead				Balancing					
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Grand Total
1	AP South	Interface	500	\$196.2	(\$367.1)	\$23.8	\$587.1	(\$11.9)	\$5.5	(\$11.7)	(\$29.1)	\$558.0	26%
2	Cloverdale - Lexington	Line	AEP	\$153.8	(\$77.5)	\$9.0	\$240.3	(\$20.6)	(\$18.6)	(\$9.1)	(\$11.0)	\$229.3	11%
3	Mount Storm - Pruntytown	Line	AP	\$60.1	(\$157.0)	\$15.8	\$232.8	(\$21.6)	(\$15.8)	(\$2.9)	(\$8.7)	\$224.1	11%
4	Bedington - Black Oak	Interface	500	\$52.2	(\$106.2)	\$7.0	\$165.5	(\$1.3)	(\$0.6)	(\$0.2)	(\$0.9)	\$164.6	8%
5	West	Interface	500	\$67.8	(\$42.5)	\$8.0	\$118.3	(\$2.0)	\$8.2	(\$2.2)	(\$12.4)	\$105.9	5%
6	Kammer	Transformer	500	\$100.9	\$23.3	\$10.4	\$88.0	(\$17.0)	(\$3.7)	\$1.4	(\$11.9)	\$76.1	4%
7	Sammis - Wylie Ridge	Line	AP	\$18.4	(\$5.9)	\$23.1	\$47.4	(\$29.7)	\$5.2	(\$71.9)	(\$106.9)	(\$59.5)	(3%)
8	Bedington	Transformer	AP	\$21.5	(\$33.2)	\$2.2	\$56.9	(\$1.8)	(\$1.4)	(\$1.1)	(\$1.4)	\$55.4	3%
9	5004/5005 Interface	Interface	500	\$16.5	(\$34.9)	\$3.0	\$54.4	(\$2.8)	\$6.9	(\$2.0)	(\$11.7)	\$42.7	2%
10	Mount Storm	Transformer	AP	\$22.3	(\$61.3)	\$10.0	\$93.6	(\$20.9)	\$14.1	(\$15.9)	(\$50.9)	\$42.7	2%
11	East	Interface	500	\$21.7	(\$17.5)	\$1.2	\$40.4	(\$0.1)	(\$0.0)	\$0.0	(\$0.0)	\$40.4	2%
12	Atlantic - Larrabee	Line	JCPL	\$41.1	(\$15.4)	\$5.4	\$61.9	(\$9.7)	\$8.2	(\$4.8)	(\$22.7)	\$39.2	2%
13	Meadow Brook	Transformer	AP	\$21.8	(\$17.5)	\$0.8	\$40.1	(\$4.4)	(\$1.2)	(\$0.4)	(\$3.6)	\$36.5	2%
14	Branchburg - Readington	Line	PSEG	\$31.0	(\$12.2)	\$4.8	\$48.1	(\$6.4)	\$8.8	(\$2.0)	(\$17.2)	\$30.9	1%
15	East Frankfort - Crete	Line	ComEd	\$7.7	(\$13.8)	\$6.7	\$28.2	\$0.0	\$0.0	\$0.0	\$0.0	\$28.2	1%
16	Aqueduct - Doubs	Line	AP	\$23.7	(\$3.9)	\$0.5	\$28.0	\$0.0	(\$0.1)	(\$0.0)	\$0.1	\$28.1	1%
17	Central	Interface	500	\$13.9	(\$11.1)	\$1.6	\$26.6	(\$0.1)	\$0.0	\$0.1	(\$0.0)	\$26.6	1%
18	Axton	Transformer	AEP	\$9.1	(\$15.4)	\$1.6	\$26.2	\$0.0	\$0.0	\$0.0	\$0.0	\$26.2	1%
19	Harwood - Susquehanna	Line	PPL	\$9.0	(\$19.9)	\$0.5	\$29.4	(\$2.6)	\$3.0	(\$0.7)	(\$6.3)	\$23.2	1%
20	Unclassified	Unclassified	Unclassified	\$10.3	(\$10.5)	\$2.0	\$22.8	\$0.0	\$0.0	\$0.0	\$0.0	\$22.8	1%
21	Krendale - Seneca	Line	AP	\$18.6	\$3.4	\$7.4	\$22.5	(\$0.1)	\$0.0	(\$0.1)	(\$0.3)	\$22.3	1%
22	Dickerson - Pleasant View	Line	Pepco	\$41.5	\$24.9	\$2.2	\$18.8	(\$0.4)	(\$1.2)	(\$1.4)	(\$0.6)	\$18.3	1%
23	Bristers - Ox	Line	Dominion	\$8.7	(\$7.4)	(\$0.9)	\$15.3	\$0.5	\$0.4	\$0.4	\$0.5	\$15.8	1%
24	North Seaford - Pine Street	Line	DPL	\$21.2	\$5.4	\$0.1	\$16.0	(\$1.0)	(\$0.6)	(\$0.1)	(\$0.6)	\$15.4	1%
25	Branchburg - Flagtown	Line	PSEG	\$12.2	(\$4.1)	\$0.2	\$16.4	\$0.5	\$1.0	(\$1.1)	(\$1.6)	\$14.8	1%

Congestion-Event Summary for Midwest ISO Flowgates

PJM and the Midwest ISO have a joint operating agreement (JOA) which defines a coordinated methodology for congestion management. This agreement establishes reciprocal, coordinated flowgates in the combined footprint whose operating limits are respected by the operators of both organizations.¹⁹ A flowgate is a representative modeling of facilities or groups of facilities that may act as constraint points on the regional system.²⁰ PJM models these coordinated flowgates

¹⁹ See "Joint Operating Agreement Between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C." (December 11, 2009) (Accessed February 19, 2010) <<http://www.pjm.com/documents/agreements/~media/documents/agreements/joa-complete.ashx>>.

²⁰ See "Joint Operating Agreement Between the Midwest Independent Transmission System Operator, Inc. And PJM Interconnection, L.L.C." (December 11, 2009) (Accessed February 19, 2010), Section 2.2.24 <<http://www.pjm.com/documents/agreements/~media/documents/agreements/joa-complete.ashx>>.

and controls for them in its security-constrained, economic dispatch. Table 7-13 and Table 7-14 show the Midwest ISO flowgates which PJM took dispatch action to control during 2009 and 2008, respectively, and which had the greatest congestion cost impact on PJM. Total congestion costs are the sum of the day-ahead and balancing congestion cost components. Total congestion costs associated with a given constraint may be positive or negative in value. The top congestion cost impacts for Midwest ISO flowgates affecting PJM dispatch are presented by constraint, in descending order of the absolute value of total congestion costs. Among Midwest ISO flowgates in 2009, the Dunes Acres – Michigan City flowgate made the most significant contribution to positive congestion while the Pana North flowgate made the most significant contribution to negative congestion. Among Midwest ISO flowgates in 2008, the State Line – Wolf Lake flowgate made the most significant contributions to positive congestion, while the Pana North flowgate made the most significant negative contribution.

Table 7-13 Top congestion cost impacts from Midwest ISO flowgates affecting PJM dispatch (By facility): Calendar year 2009

No.	Constraint	Congestion Costs (Millions)										Event Hours	Day Ahead	Real Time
		Day Ahead				Balancing				Grand Total				
		Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total					
1	Dunes Acres - Michigan City	\$13.5	(\$23.2)	\$8.6	\$45.4	(\$7.2)	(\$2.0)	(\$23.4)	(\$28.6)	\$16.7	2,949	910		
2	Crete - St Johns Tap	\$3.2	(\$15.1)	\$3.8	\$22.0	(\$1.1)	\$0.4	(\$6.1)	(\$7.7)	\$14.4	1,565	306		
3	Pana North	\$0.1	(\$2.2)	\$1.8	\$4.2	(\$0.5)	\$1.1	(\$11.5)	(\$13.0)	(\$8.9)	986	318		
4	Schahfer - Burr Oak	\$0.4	(\$1.3)	\$0.6	\$2.3	(\$2.0)	\$0.4	(\$5.4)	(\$7.8)	(\$5.6)	62	81		
5	Paddock - Townline	\$0.5	(\$3.6)	\$0.4	\$4.6	\$0.6	\$0.3	(\$0.3)	(\$0.0)	\$4.5	404	215		
6	Breed - Wheatland	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.7	(\$3.2)	(\$3.8)	(\$3.8)	0	161		
7	Rising	(\$0.1)	(\$2.7)	\$0.5	\$3.1	\$0.0	\$0.2	(\$0.8)	(\$1.0)	\$2.1	565	150		
8	Palisades - Argenta	\$0.1	(\$0.1)	\$0.1	\$0.3	(\$0.3)	\$0.6	(\$1.1)	(\$2.1)	(\$1.8)	49	58		
9	Pleasant Prairie - Zion	(\$0.0)	(\$0.4)	\$0.1	\$0.5	\$0.3	\$0.5	(\$1.9)	(\$2.2)	(\$1.7)	100	45		
10	State Line - Wolf Lake	\$0.5	(\$2.6)	\$1.1	\$4.3	(\$0.5)	\$0.6	(\$1.6)	(\$2.7)	\$1.6	1,261	183		
11	Eugene - Bunsonville	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.1	(\$1.1)	(\$1.3)	(\$1.3)	0	44		
12	Oak Grove - Galesburg	(\$0.6)	(\$4.3)	\$0.1	\$3.8	\$0.8	\$1.4	(\$4.2)	(\$4.8)	(\$1.0)	754	638		
13	State Line - Roxana	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.2)	\$0.0	(\$0.4)	(\$0.6)	(\$0.6)	0	30		
14	Pawnee	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	(\$0.4)	(\$0.4)	(\$0.4)	0	35		
15	Lanesville	\$0.3	(\$0.1)	\$0.1	\$0.5	\$0.0	\$0.1	(\$0.8)	(\$0.9)	(\$0.4)	104	32		
16	Pierce - Foster	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.3	(\$0.0)	(\$0.4)	(\$0.4)	0	5		
17	Burr Oak	\$0.1	(\$0.4)	\$0.5	\$0.9	(\$0.2)	\$0.2	(\$0.8)	(\$1.3)	(\$0.3)	71	66		
18	Krendale - Seneca	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.1	(\$0.1)	(\$0.2)	(\$0.2)	0	30		
19	Bunsonville - Eugene	\$0.0	(\$0.1)	\$0.1	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	24	0		
20	State Line	\$0.0	(\$0.0)	(\$0.0)	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	299	0		

**Table 7-14 Top congestion cost impacts from Midwest ISO flowgates affecting PJM dispatch (By facility):
Calendar year 2008**

No.	Constraint	Congestion Costs (Millions)										Event Hours	
		Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
		Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	Pana North	\$0.7	(\$1.8)	\$0.6	\$3.1	(\$0.7)	\$1.4	(\$11.5)	(\$13.5)	(\$10.5)	190	640	
2	Pleasant Prairie - Zion	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.7)	\$0.2	(\$5.3)	(\$6.2)	(\$6.2)	0	72	
3	Lanesville	\$0.2	(\$0.4)	\$0.3	\$0.9	(\$0.2)	\$0.8	(\$5.7)	(\$6.7)	(\$5.8)	60	153	
4	State Line - Wolf Lake	\$2.2	(\$4.4)	\$5.0	\$11.7	(\$1.0)	\$1.2	(\$4.1)	(\$6.3)	\$5.3	1,342	370	
5	Schahfer - Burr Oak	\$0.2	(\$0.4)	\$0.1	\$0.7	(\$1.2)	(\$0.7)	(\$2.3)	(\$2.7)	(\$2.0)	38	160	
6	Rising	\$0.0	(\$0.0)	\$0.0	\$0.1	(\$0.2)	\$0.0	(\$1.8)	(\$2.0)	(\$1.9)	16	89	
7	Crete - St Johns Tap	\$0.9	(\$1.3)	\$0.3	\$2.5	(\$0.2)	\$0.1	(\$0.4)	(\$0.7)	\$1.8	84	14	
8	Dunes Acres - Michigan City	\$5.3	(\$6.0)	\$5.5	\$16.8	(\$2.9)	\$0.2	(\$13.0)	(\$16.1)	\$0.7	687	435	
9	Breed - Wheatland	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.2	(\$0.3)	(\$0.5)	(\$0.5)	0	11	
10	State Line - Roxana	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.1	(\$0.3)	(\$0.4)	(\$0.4)	0	37	
11	Ontario Hydro - NYISO	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.3)	(\$0.1)	(\$0.0)	(\$0.2)	(\$0.2)	0	15	
12	Krendale - Seneca	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.0	(\$0.0)	(\$0.2)	(\$0.2)	0	23	
13	Eugene - Bunsonville	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.1)	(\$0.1)	(\$0.1)	0	12	
14	Salem	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.1	0	1	
15	State Line	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	0	0	
16	DC Cook - Palisades	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.1	\$0.0	\$0.0	0	3	
17	Eau Claire - Arpin	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	0	10	
18	Greenfield - Lakeview	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	0	8	
19	Paddock - Townline	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0	0	6	
20	Pawnee	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	0	1	

Congestion-Event Summary for the 500 kV System

Constraints on the 500 kV system generally have a regional impact. Table 7-15 and Table 7-16 show the 500 kV constraints impacting congestion costs in PJM. Total congestion costs are the sum of the day-ahead and balancing congestion cost components. Total congestion costs associated with a given constraint may be positive or negative in value. The 500 kV constraints impacting congestion costs in PJM are presented by constraint, in descending order of the absolute value of total congestion costs. In 2009, the AP South interface constraint contributed to positive congestion. There were no significant contributions to negative congestion from 500 kV constraints in 2009. In 2008, the AP South and Bedington – Black Oak interface constraints contributed to positive congestion. In 2008, the Juniata – Keystone and Cabot – Wylie Ridge lines contributed to negative congestion.

Table 7-15 Regional constraints summary (By facility): Calendar year 2009

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Grand Total	Event Hours	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
1	AP South	Interface	500	\$12.0	(\$186.0)	(\$0.2)	\$197.8	\$2.9	(\$2.9)	\$2.9	\$8.7	\$206.5	3,501	604
2	West	Interface	500	\$19.4	(\$22.9)	\$0.7	\$42.9	\$0.4	(\$0.3)	\$0.1	\$0.8	\$43.7	504	87
3	5004/5005 Interface	Interface	500	\$11.1	(\$31.0)	\$0.3	\$42.4	\$1.3	\$0.3	\$0.2	\$1.1	\$43.6	776	294
4	Kammer	Transformer	500	\$50.8	\$16.1	\$9.0	\$43.8	(\$4.9)	(\$6.7)	(\$11.6)	(\$9.8)	\$34.0	3,674	1,328
5	Bedington - Black Oak	Interface	500	\$3.8	(\$15.5)	\$0.8	\$20.1	(\$0.4)	(\$0.1)	\$0.1	(\$0.2)	\$19.8	645	73
6	AEP-DOM	Interface	500	\$1.4	(\$7.6)	\$0.5	\$9.5	(\$0.5)	(\$0.2)	(\$0.0)	(\$0.3)	\$9.2	325	136
7	East	Interface	500	\$0.3	(\$0.3)	(\$0.0)	\$0.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	32	0
8	Doubs - Mount Storm	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.1)	\$0.0	\$0.1	\$0.1	0	18
9	Harrison Tap - Kammer	Line	500	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.1	\$0.1	1	11
10	Central	Interface	500	\$0.0	(\$0.1)	\$0.0	\$0.1	\$0.0	\$0.1	(\$0.0)	(\$0.1)	\$0.1	19	8
11	Belmont - Harrison	Line	500	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	5	2
12	Harrison - Pruntytown	Line	500	\$0.0	(\$0.0)	\$0.0	\$0.0	(\$0.0)	(\$0.1)	(\$0.0)	(\$0.0)	\$0.0	2	43
13	Conemaugh - Hunterstown	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	0	1
14	Harrison Tap - North Longview	Line	500	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	2	0

Table 7-16 Regional constraints summary (By facility): Calendar year 2008

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Grand Total	Event Hours	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
1	AP South	Interface	500	\$196.2	(\$367.1)	\$23.8	\$587.1	(\$11.9)	\$5.5	(\$11.7)	(\$29.1)	\$558.0	3,572	1,016
2	Bedington - Black Oak	Interface	500	\$52.2	(\$106.2)	\$7.0	\$165.5	(\$1.3)	(\$0.6)	(\$0.2)	(\$0.9)	\$164.6	1,384	284
3	West	Interface	500	\$67.8	(\$42.5)	\$8.0	\$118.3	(\$2.0)	\$8.2	(\$2.2)	(\$12.4)	\$105.9	1,690	390
4	Kammer	Transformer	500	\$100.9	\$23.3	\$10.4	\$88.0	(\$17.0)	(\$3.7)	\$1.4	(\$11.9)	\$76.1	3,069	1,628
5	5004/5005 Interface	Interface	500	\$16.5	(\$34.9)	\$3.0	\$54.4	(\$2.8)	\$6.9	(\$2.0)	(\$11.7)	\$42.7	736	449
6	East	Interface	500	\$21.7	(\$17.5)	\$1.2	\$40.4	(\$0.1)	(\$0.0)	\$0.0	(\$0.0)	\$40.4	758	12
7	Central	Interface	500	\$13.9	(\$11.1)	\$1.6	\$26.6	(\$0.1)	\$0.0	\$0.1	(\$0.0)	\$26.6	726	42
8	Fort Martin - Harrison	Line	500	\$2.0	(\$0.3)	\$0.4	\$2.7	\$0.0	\$0.0	\$0.0	\$0.0	\$2.7	45	0
9	Juniata - Keystone	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.8)	\$0.4	\$0.2	(\$1.0)	(\$1.0)	0	21
10	Conemaugh - Keystone	Line	500	\$0.4	(\$0.2)	\$0.2	\$0.8	\$0.9	\$0.8	(\$0.1)	\$0.1	\$0.9	16	41
11	Cabot - Wylie Ridge	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	(\$0.1)	(\$0.8)	(\$0.8)	0	6
12	AEP-DOM	Interface	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.2	(\$0.2)	(\$0.5)	(\$0.5)	0	49
13	Doubs - Mount Storm	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.1)	\$0.1	\$0.1	\$0.1	0	6
14	Conemaugh - Hunterstown	Line	500	\$1.6	(\$1.6)	\$0.4	\$3.6	(\$0.5)	\$1.3	(\$1.9)	(\$3.6)	(\$0.1)	62	98
15	Harrison - Pruntytown	Line	500	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.1)	(\$0.0)	\$0.0	\$0.0	0	2

Zonal Congestion

Summary

Day-ahead and balancing congestion costs within specific zones for calendar years 2009 and 2008 are presented in Table 7-17 and Table 7-18. While total congestion costs represent the overall charge or credit to a zone, the components of congestion costs measure the extent to which load or generation bear total congestion costs. Load congestion payments, when positive, measure the total congestion cost to load in an area. Load congestion payments, when negative, measure the total congestion credit to load in an area. Negative load congestion payments result when load is on the lower priced side of a constraint or constraints. For example, congestion across the AP South interface means lower prices in western control zones and higher prices in eastern and southern control zones. Load in western control zones will benefit from lower prices and receive a congestion credit (negative load congestion payment). Load in the eastern and southern control zones will incur a congestion charge (positive load congestion payment). The reverse is true for generation congestion credits. Generation congestion credits, when positive, measure the total congestion credit to generation in an area. Generation congestion credits, when negative, measure the total congestion cost to generation in an area. Negative generation congestion credits result when generation is on the lower priced side of a constraint or constraints. For example, congestion across the AP South interface means lower prices in the western control zones and higher prices in the eastern and southern control zones. Generation in the western control zones will receive lower prices and incur a congestion charge (negative generation congestion credit). Generation in the eastern and southern control zones will receive higher prices and receive a congestion credit (positive generation congestion credit).

PJM congestion accounting nets load congestion payments against generation congestion credits by billing organization. The net congestion bill for a zone or constraint may be either positive or negative, depending on the relative size and sign of load congestion payments and generation congestion credits. When summed across a zone, the net congestion bill shows the overall congestion charge or credit for an area, not including explicit congestion, but the net congestion bill is not a good measure of whether load is paying higher prices in the form of congestion.

The ComEd Control Zone, the Dominion Control Zone and the AP Control Zone are good examples of how a positive net congestion bill can result from very different combinations of load payments and generation credits. The ComEd Control Zone had the highest congestion charges, \$219.7 million, of any control zone in 2009. The large positive congestion costs in the ComEd Control Zone were the result of large negative load congestion payments offset by even larger negative generation congestion credits. The Dominion Control Zone had the second highest congestion charges, \$112.9 million, of any control zone in 2009. The large positive congestion costs in the Dominion Control Zone were the result of large positive load congestion payments offset only in part by relatively low positive generation congestion credits. The AP Control Zone had the third highest congestion charges, \$95.3 million, of any control zone in 2009. The positive congestion costs in the AP Control Zone were the result of positive load congestion payments and larger negative generation congestion credits, which added to the total congestion costs for AP rather than offsetting the positive load congestion payments.

Table 7-17 Congestion cost summary (By control zone): Calendar year 2009

Control Zone	Congestion Costs (Millions)								Grand Total
	Day Ahead				Balancing				
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	
AECO	\$24.5	\$9.2	\$0.2	\$15.6	(\$0.5)	\$0.9	\$0.4	(\$1.0)	\$14.6
AEP	(\$60.2)	(\$160.5)	\$9.0	\$109.3	(\$7.2)	\$8.4	(\$10.7)	(\$26.3)	\$83.0
AP	\$33.2	(\$80.7)	\$12.9	\$126.9	(\$4.5)	\$5.0	(\$22.1)	(\$31.6)	\$95.3
BGE	\$97.6	\$75.9	\$2.4	\$24.0	\$6.9	(\$5.0)	(\$2.3)	\$9.5	\$33.5
ComEd	(\$255.3)	(\$493.1)	(\$4.1)	\$233.7	(\$7.6)	\$6.1	(\$0.4)	(\$14.0)	\$219.7
DAY	(\$9.7)	(\$18.7)	(\$0.5)	\$8.5	\$0.9	\$1.7	\$0.1	(\$0.7)	\$7.8
DLCO	(\$50.7)	(\$75.8)	(\$0.0)	\$25.1	(\$4.0)	\$5.3	(\$0.2)	(\$9.5)	\$15.6
Dominion	\$94.0	(\$15.4)	\$7.5	\$117.0	\$1.1	(\$3.0)	(\$8.2)	(\$4.1)	\$112.9
DPL	\$49.7	\$15.0	\$0.4	\$35.1	(\$1.9)	\$1.6	(\$0.4)	(\$4.0)	\$31.1
External	(\$22.2)	(\$56.7)	\$37.3	\$71.9	(\$1.3)	(\$7.6)	(\$79.1)	(\$72.8)	(\$1.0)
JCPL	\$46.7	\$18.9	\$0.1	\$27.9	\$0.4	(\$2.7)	(\$0.2)	\$2.9	\$30.8
Met-Ed	\$36.9	\$36.8	\$0.2	\$0.4	\$0.1	(\$1.0)	(\$0.3)	\$0.8	\$1.1
PECO	\$19.0	\$39.9	\$0.1	(\$20.8)	(\$0.4)	\$2.8	(\$0.1)	(\$3.3)	(\$24.1)
PENELEC	(\$6.8)	(\$38.9)	\$0.3	\$32.4	\$1.3	\$0.8	(\$0.1)	\$0.4	\$32.8
Pepco	\$203.9	\$133.9	\$3.5	\$73.5	(\$21.2)	(\$9.7)	(\$3.6)	(\$15.1)	\$58.4
PPL	\$14.6	\$23.4	\$2.7	(\$6.1)	(\$0.3)	(\$0.5)	\$0.2	\$0.4	(\$5.7)
PSEG	\$74.8	\$61.7	\$11.7	\$24.8	(\$0.7)	\$6.9	(\$6.2)	(\$13.8)	\$11.0
RECO	\$2.2	\$0.0	\$0.1	\$2.3	\$0.0	(\$0.0)	(\$0.1)	(\$0.1)	\$2.2
Total	\$292.3	(\$525.2)	\$83.9	\$901.4	(\$39.0)	\$10.1	(\$133.4)	(\$182.4)	\$719.0

Table 7-18 Congestion cost summary (By control zone): Calendar year 2008

Control Zone	Congestion Costs (Millions)								
	Day Ahead				Balancing				Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	
AECO	\$111.1	\$31.8	\$1.2	\$80.5	(\$12.9)	\$8.1	(\$2.0)	(\$23.0)	\$57.5
AEP	(\$367.1)	(\$671.0)	\$15.7	\$319.6	(\$85.2)	\$4.0	(\$6.9)	(\$96.1)	\$223.6
AP	\$124.4	(\$391.6)	\$38.7	\$554.7	(\$13.6)	\$21.5	(\$32.6)	(\$67.7)	\$487.1
BGE	\$314.3	\$245.3	\$3.2	\$72.2	\$10.1	(\$14.2)	(\$4.5)	\$19.8	\$92.0
ComEd	(\$480.9)	(\$820.9)	\$4.8	\$344.8	(\$54.9)	\$0.4	(\$5.2)	(\$60.6)	\$284.2
DAY	(\$45.5)	(\$56.5)	\$0.2	\$11.1	\$3.5	\$2.6	(\$0.3)	\$0.6	\$11.8
DLCO	(\$159.2)	(\$249.2)	\$1.1	\$91.2	(\$49.4)	\$22.2	\$0.3	(\$71.3)	\$19.9
Dominion	\$337.2	\$5.2	\$33.0	\$364.9	(\$9.3)	(\$0.9)	(\$33.9)	(\$42.3)	\$322.6
DPL	\$149.5	\$54.1	\$1.1	\$96.5	\$8.0	\$6.2	(\$1.8)	(\$0.1)	\$96.4
External	(\$59.5)	(\$51.5)	\$35.6	\$27.5	(\$31.6)	(\$36.4)	(\$107.5)	(\$102.7)	(\$75.2)
JCPL	\$260.6	\$72.1	\$9.1	\$197.6	(\$0.0)	(\$0.4)	(\$8.9)	(\$8.5)	\$189.0
Met-Ed	\$104.9	\$104.5	\$3.3	\$3.8	\$2.3	\$0.8	\$10.4	\$12.0	\$15.7
PECO	\$70.9	\$118.1	\$0.5	(\$46.8)	(\$0.5)	\$15.5	(\$0.7)	(\$16.8)	(\$63.5)
PENELEC	(\$43.2)	(\$224.3)	\$4.8	\$186.0	(\$4.8)	\$13.6	(\$1.4)	(\$19.9)	\$166.1
Pepco	\$642.4	\$436.2	\$8.4	\$214.7	\$6.6	(\$3.7)	(\$9.1)	\$1.2	\$215.9
PPL	\$29.0	\$39.9	\$12.7	\$1.8	\$0.2	\$5.6	(\$5.2)	(\$10.6)	(\$8.8)
PSEG	\$287.3	\$190.9	\$33.3	\$129.7	\$5.2	\$34.5	(\$27.9)	(\$57.3)	\$72.5
RECO	\$10.0	\$0.1	\$1.5	\$11.4	\$0.5	(\$0.2)	(\$2.2)	(\$1.5)	\$9.9
Total	\$1,286.1	(\$1,166.7)	\$208.4	\$2,661.2	(\$225.9)	\$79.2	(\$239.5)	(\$544.6)	\$2,116.6

Details of Regional and Zonal Congestion

Constraints were examined by zone and categorized by their effect on regions. Zones correspond to regulated utility franchise areas. Regions generally comprise two or more zones. PJM is comprised of three regions: the PJM Mid-Atlantic Region with 11 control zones (the AECO, BGE, DPL, JCPL, Met-Ed, PECO, PENELEC, Pepco, PPL, PSEG and RECO control zones); the PJM Western Region with five control zones (the AP, ComEd, AEP, DLCO and DAY control zones); and the PJM Southern Region with one control zone (the Dominion Control Zone).

Table 7-19 through Table 7-52 present the top 15 constraints affecting each control zone's congestion costs, including the facility type and the location of the constrained facility for both 2009 and 2008. In addition, day-ahead and real-time congestion-event hours are presented for each of the highlighted constraints. Constraints can have wide-ranging effects, influencing prices and congestion across multiple zones. Many constraints that are physically located outside of a control zone can impact the congestion costs of that control zone. The following tables present the constraints in descending order of the absolute value of total congestion costs. In addition to the top 15 constraints, these tables show the top five local constraints for the control zone, which were not in the top 15 constraints, but are located inside the respective control zone. These constraints are shown to illustrate the effect local constraints have on the control zone in which they are located. In

2009, the RECO and DAY control zones did not have any constraints within their boundaries, thus the tables show only the top 15 constraints.

For each of the constraints presented in the following tables, the zonal cost impacts are decomposed into their Day-Ahead Energy Market and balancing market components. Total congestion costs are the sum of the day-ahead and balancing congestion cost components. Total congestion costs associated with a given constraint may be positive or negative in value.

Mid-Atlantic Region Congestion-Event Summaries

AECO Control Zone

Table 7-19 AECO Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours		
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total					
1	Kammer	Transformer	500	\$4.2	\$1.3	\$0.0	\$2.9	\$0.2	(\$0.0)	\$0.0	\$0.3	\$3.1	3,674	1,328		
2	West	Interface	500	\$4.9	\$2.3	\$0.1	\$2.6	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$2.7	504	87		
3	5004/5005 Interface	Interface	500	\$4.4	\$1.9	\$0.0	\$2.5	\$0.1	\$0.0	\$0.0	\$0.1	\$2.7	776	294		
4	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$1.4	\$0.3	\$0.0	\$1.1	\$0.1	(\$0.0)	\$0.0	\$0.2	\$1.3	2,949	910		
5	Graceton - Raphael Road	Line	BGE	(\$1.5)	(\$0.5)	(\$0.0)	(\$1.1)	\$0.2	\$0.1	\$0.0	\$0.0	(\$1.1)	527	152		
6	Wylie Ridge	Transformer	AP	\$1.8	\$0.9	\$0.0	\$0.9	(\$0.0)	\$0.1	\$0.1	(\$0.0)	\$0.9	354	335		
7	Absecon - Lewis	Line	AECO	\$1.0	\$0.1	\$0.0	\$1.0	(\$1.2)	\$0.5	(\$0.0)	(\$1.7)	(\$0.8)	22	149		
8	Atlantic - Larrabee	Line	JCPL	(\$0.5)	(\$0.1)	(\$0.0)	(\$0.4)	(\$0.2)	\$0.1	\$0.0	(\$0.3)	(\$0.7)	280	73		
9	Doubs	Transformer	AP	\$1.0	\$0.4	\$0.0	\$0.6	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.6	429	246		
10	AP South	Interface	500	\$1.0	\$0.5	\$0.0	\$0.6	\$0.0	\$0.0	\$0.1	\$0.1	\$0.6	3,501	604		
11	Monroe	Transformer	AECO	\$0.5	\$0.0	\$0.0	\$0.4	\$0.1	(\$0.0)	\$0.0	\$0.1	\$0.5	263	13		
12	Shieldalloy - Vineland	Line	AECO	\$1.1	\$0.3	\$0.0	\$0.9	(\$0.3)	\$0.1	(\$0.0)	(\$0.4)	\$0.5	148	61		
13	East Frankfort - Crete	Line	ComEd	\$0.7	\$0.2	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	2,134	0		
14	Tiltsville - Windsor	Line	AP	\$0.6	\$0.2	\$0.0	\$0.4	\$0.0	(\$0.0)	(\$0.0)	\$0.1	\$0.5	1,449	311		
15	Samms - Wylie Ridge	Line	AP	\$0.7	\$0.3	\$0.0	\$0.4	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.5	762	157		
16	Monroe - New Freedom	Line	AECO	\$0.8	\$0.4	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	584	0		
23	Lewis - Motts - Cedar	Line	AECO	\$0.2	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	108	0		
34	Corson - Union	Line	AECO	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.1	\$0.1	0	3		
87	Clayton - Williams	Line	AECO	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	3	0		
121	Corson	Transformer	AECO	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	1	0		

Table 7-20 AECO Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)											
				Load Payments	Day Ahead			Load Payments	Balancing			Grand Total	Event Hours		
					Generation Credits	Explicit	Total		Generation Credits	Explicit	Total		Day Ahead	Real Time	
1	Monroe	Transformer	AECO	\$34.4	\$3.6	\$0.2	\$31.0	(\$14.5)	\$4.3	(\$0.7)	(\$19.5)	\$11.5	815	254	
2	West	Interface	500	\$12.6	\$5.6	\$0.1	\$7.2	\$0.5	(\$0.0)	(\$0.1)	\$0.4	\$7.6	1,690	390	
3	AP South	Interface	500	\$13.0	\$5.6	\$0.3	\$7.7	\$0.1	\$0.1	(\$0.2)	(\$0.1)	\$7.6	3,572	1,016	
4	Cloverdale - Lexington	Line	AEP	\$8.0	\$4.2	\$0.0	\$3.8	\$0.7	(\$0.1)	(\$0.1)	\$0.7	\$4.5	3,529	1,813	
5	Atlantic - Larrabee	Line	JCPL	(\$6.5)	(\$2.9)	(\$0.0)	(\$3.6)	(\$0.4)	\$0.4	\$0.0	(\$0.8)	(\$4.4)	1,556	380	
6	Kammer	Transformer	500	\$7.2	\$3.4	\$0.1	\$3.9	\$0.4	\$0.1	(\$0.1)	\$0.3	\$4.1	3,069	1,628	
7	Churchtown	Transformer	AECO	(\$0.3)	(\$3.0)	\$0.0	\$2.7	\$0.4	\$0.3	(\$0.0)	\$0.1	\$2.8	179	104	
8	East	Interface	500	\$5.3	\$2.8	\$0.0	\$2.6	\$0.0	(\$0.0)	\$0.0	\$0.0	\$2.6	758	12	
9	Quinton - Roadstown	Line	AECO	\$6.3	\$1.0	\$0.0	\$5.3	(\$1.3)	\$1.4	(\$0.1)	(\$2.8)	\$2.5	288	124	
10	5004/5005 Interface	Interface	500	\$4.2	\$1.8	\$0.0	\$2.3	\$0.1	\$0.0	(\$0.0)	\$0.0	\$2.4	736	449	
11	Central	Interface	500	\$4.5	\$2.4	\$0.0	\$2.1	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$2.1	726	42	
12	Sickler	Transformer	AECO	\$0.9	\$0.1	\$0.0	\$0.8	(\$0.2)	\$0.4	(\$0.2)	(\$0.8)	\$0.0	31	55	
13	Sammis - Wylie Ridge	Line	AP	\$2.4	\$1.3	\$0.0	\$1.1	\$0.6	\$0.1	(\$0.1)	\$0.4	\$1.5	1,915	1,257	
14	Dickerson - Pleasant View	Line	Pepco	\$2.6	\$1.3	\$0.0	\$1.3	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.4	844	218	
15	Mount Storm - Pruntytown	Line	AP	\$2.7	\$1.2	\$0.2	\$1.6	(\$0.1)	\$0.0	(\$0.2)	(\$0.3)	\$1.4	2,559	812	
18	Cumberland	Transformer	AECO	\$0.8	\$0.1	\$0.0	\$0.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.8	57	0	
22	Laurel - Roadstown	Line	AECO	\$0.7	\$0.1	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	147	0	
25	Lenox - Lewis	Line	AECO	\$0.5	\$0.1	\$0.0	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	25	0	
27	Orchard	Transformer	AECO	\$0.6	\$0.4	\$0.0	\$0.2	(\$0.2)	\$0.3	(\$0.1)	(\$0.6)	(\$0.4)	20	14	
33	Shieldalloy - Vineland	Line	AECO	\$0.4	\$0.0	\$0.0	\$0.4	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	\$0.3	91	6	

BGE Control Zone

Table 7-21 BGE Control Zone top congestion cost impacts (By facility): Calendar year 2009

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Load Payments	Day Ahead			Balancing				Grand Total	Event Hours	
					Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
1	AP South	Interface	500	\$25.2	\$23.7	\$0.5	\$2.0	\$1.7	(\$1.2)	(\$0.5)	\$2.5	\$4.5	3,501	604
2	Kammer	Transformer	500	\$11.9	\$9.0	\$0.2	\$3.2	\$1.0	(\$0.6)	(\$0.2)	\$1.3	\$4.5	3,674	1,328
3	Brandon Shores - Riverside	Line	BGE	\$1.9	(\$1.0)	\$0.0	\$3.0	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	\$2.9	134	13
4	Doubs	Transformer	AP	\$6.4	\$5.0	\$0.4	\$1.8	\$0.5	(\$0.6)	(\$0.4)	\$0.7	\$2.5	429	246
5	Graceton - Raphael Road	Line	BGE	\$6.6	\$4.2	\$0.1	\$2.4	\$0.0	\$0.0	(\$0.1)	(\$0.1)	\$2.3	527	152
6	5004/5005 Interface	Interface	500	\$3.1	\$1.7	\$0.1	\$1.5	\$0.3	(\$0.2)	(\$0.1)	\$0.4	\$1.9	776	294
7	West	Interface	500	\$8.9	\$7.4	\$0.2	\$1.6	\$0.1	(\$0.2)	(\$0.1)	\$0.2	\$1.9	504	87
8	Wylie Ridge	Transformer	AP	\$3.6	\$3.4	\$0.1	\$0.3	\$0.6	(\$0.7)	(\$0.2)	\$1.2	\$1.5	354	335
9	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$3.4	\$2.8	\$0.0	\$0.6	\$0.3	(\$0.0)	(\$0.0)	\$0.4	\$1.0	2,949	910
10	Bedington - Black Oak	Interface	500	\$3.9	\$3.3	\$0.1	\$0.8	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$0.9	645	73
11	Mount Storm - Pruntytown	Line	AP	\$3.2	\$2.9	\$0.0	\$0.2	\$0.5	(\$0.3)	(\$0.1)	\$0.6	\$0.9	525	132
12	Pumphrey - Westport	Line	Pepco	\$0.5	(\$0.1)	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	1,181	0
13	Fullerton - Windyedge	Line	BGE	\$0.5	(\$0.1)	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	31	0
14	Tiltsville - Windsor	Line	AP	\$1.2	\$0.8	\$0.0	\$0.5	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$0.6	1,449	311
15	Cloverdale - Lexington	Line	AEP	\$2.6	\$2.5	\$0.0	\$0.2	\$0.4	(\$0.1)	(\$0.1)	\$0.4	\$0.6	1,015	434
16	Five Forks - Rock Ridge	Line	BGE	\$0.7	\$0.2	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	136	0
21	Conastone	Transformer	BGE	\$1.0	\$0.6	(\$0.0)	\$0.3	\$0.0	(\$0.0)	(\$0.0)	\$0.1	\$0.4	75	12
24	Green Street - Westport	Line	BGE	\$0.3	(\$0.0)	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	365	0
28	Conastone - Otter	Line	BGE	\$0.4	\$0.2	\$0.0	\$0.2	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.2	92	32
31	Waugh Chapel	Transformer	BGE	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.2)	\$0.0	\$0.2	\$0.2	0	8

Table 7-22 BGE Control Zone top congestion cost impacts (By facility): Calendar year 2008

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Load Payments	Day Ahead			Balancing				Grand Total	Event Hours	
					Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		Day Ahead	Real Time
1	AP South	Interface	500	\$86.9	\$68.9	\$0.6	\$18.6	\$4.6	(\$3.8)	(\$0.9)	\$7.6	\$26.2	3,572	1,016
2	Mount Storm - Pruntytown	Line	AP	\$38.9	\$32.3	\$0.3	\$6.9	\$0.1	(\$2.3)	(\$0.1)	\$2.3	\$9.2	2,559	812
3	West	Interface	500	\$21.7	\$15.9	\$0.4	\$6.2	\$1.1	(\$0.8)	(\$0.6)	\$1.3	\$7.5	1,690	390
4	Kammer	Transformer	500	\$18.9	\$15.4	\$0.4	\$4.0	\$1.2	(\$1.4)	(\$0.4)	\$2.2	\$6.2	3,069	1,628
5	Dickerson - Pleasant View	Line	Pepco	\$12.5	\$8.1	\$0.4	\$4.8	\$0.7	(\$0.5)	(\$0.2)	\$1.0	\$5.8	844	218
6	Aqueduct - Doubs	Line	AP	\$12.2	\$7.0	\$0.0	\$5.2	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$5.2	307	7
7	Pumphrey - Westport	Line	Pepco	\$4.3	(\$0.4)	\$0.0	\$4.7	\$0.0	\$0.0	\$0.0	\$0.0	\$4.7	1,092	0
8	Bedington - Black Oak	Interface	500	\$24.8	\$22.7	\$0.3	\$2.4	\$1.0	(\$0.6)	(\$0.1)	\$1.5	\$3.9	1,384	284
9	Conastone	Transformer	BGE	\$4.4	\$1.4	(\$0.0)	\$3.1	\$0.1	(\$0.0)	\$0.0	\$0.1	\$3.2	95	15
10	Sammis - Wylie Ridge	Line	AP	\$5.2	\$4.3	\$0.1	\$1.0	\$1.1	(\$0.8)	(\$0.4)	\$1.5	\$2.5	1,915	1,257
11	Mount Storm	Transformer	AP	\$12.7	\$11.0	\$0.1	\$1.8	(\$0.3)	(\$1.0)	(\$0.1)	\$0.7	\$2.5	935	469
12	Green Street - Westport	Line	BGE	\$2.3	(\$0.0)	\$0.0	\$2.3	\$0.0	\$0.0	\$0.0	\$0.0	\$2.3	346	0
13	Cloverdale - Lexington	Line	AEP	\$40.5	\$41.6	\$0.5	(\$0.7)	\$2.1	(\$1.0)	(\$0.4)	\$2.8	\$2.2	3,529	1,813
14	5004/5005 Interface	Interface	500	\$3.4	\$1.9	\$0.1	\$1.6	\$0.2	(\$0.3)	(\$0.1)	\$0.3	\$1.9	736	449
15	Brandon Shores - Riverside	Line	BGE	\$1.3	(\$0.8)	\$0.0	\$2.1	(\$0.6)	\$0.2	(\$0.0)	(\$0.9)	\$1.2	150	58
23	Graceton - Raphael Road	Line	BGE	\$0.3	\$0.2	\$0.0	\$0.1	(\$1.0)	(\$0.2)	(\$0.0)	(\$0.9)	(\$0.7)	29	49
37	Concord - Green Street	Line	BGE	\$0.0	(\$0.0)	\$0.0	\$0.0	(\$0.2)	\$0.1	(\$0.0)	(\$0.3)	(\$0.3)	88	24
38	Conastone - Graceton	Line	BGE	\$0.5	\$0.2	\$0.0	\$0.3	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.3	19	2
39	Mapes Road - Dorsey Run	Line	BGE	\$0.4	\$0.1	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	51	0
58	Gwynnbrook - Mays Chapel	Line	BGE	\$0.4	\$0.1	\$0.0	\$0.3	(\$0.2)	(\$0.1)	(\$0.0)	(\$0.1)	\$0.2	8	8

DPL Control Zone

Table 7-23 DPL Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	Kammer	Transformer	500	\$7.5	\$1.7	\$0.0	\$5.9	(\$0.1)	\$0.3	(\$0.1)	(\$0.4)	\$5.4	3,674	1,328	
2	West	Interface	500	\$9.2	\$3.8	\$0.0	\$5.5	(\$0.0)	\$0.1	(\$0.0)	(\$0.1)	\$5.3	504	87	
3	5004/5005 Interface	Interface	500	\$7.3	\$2.8	\$0.1	\$4.5	\$0.1	\$0.3	(\$0.1)	(\$0.3)	\$4.2	776	294	
4	Short - Laurel	Line	DPL	\$0.0	\$0.0	\$0.0	\$0.0	(\$2.1)	\$0.2	(\$0.1)	(\$2.4)	(\$2.4)	0	27	
5	Wylie Ridge	Transformer	AP	\$3.4	\$1.3	\$0.0	\$2.1	\$0.2	\$0.2	(\$0.0)	(\$0.0)	\$2.1	354	335	
6	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$2.4	\$0.3	(\$0.0)	\$2.1	(\$0.1)	\$0.0	\$0.0	(\$0.1)	\$2.0	2,949	910	
7	AP South	Interface	500	\$3.0	\$0.9	\$0.0	\$2.1	\$0.0	\$0.1	(\$0.0)	(\$0.1)	\$1.9	3,501	604	
8	Graceton - Raphael Road	Line	BGE	(\$2.7)	(\$0.7)	(\$0.0)	(\$2.0)	\$0.4	(\$0.2)	\$0.0	\$0.6	(\$1.4)	527	152	
9	Middletown - Mt Pleasant	Line	DPL	\$1.8	\$0.3	\$0.0	\$1.5	(\$0.2)	\$0.0	\$0.0	(\$0.2)	\$1.3	312	17	
10	Sammis - Wylie Ridge	Line	AP	\$1.5	\$0.3	\$0.0	\$1.2	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	\$1.1	762	157	
11	East Frankfort - Crete	Line	ComEd	\$1.3	\$0.3	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.0	2,134	0	
12	North Seaford - Pine Street	Line	DPL	\$1.0	\$0.2	\$0.0	\$0.8	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.8	331	1	
13	Cloverdale - Lexington	Line	AEP	\$1.0	\$0.2	\$0.0	\$0.8	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.8	1,015	434	
14	Doubs	Transformer	AP	\$1.8	\$1.1	\$0.0	\$0.8	\$0.0	\$0.1	(\$0.0)	(\$0.1)	\$0.7	429	246	
15	Tiltsville - Windsor	Line	AP	\$1.0	\$0.2	\$0.0	\$0.8	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	\$0.7	1,449	311	
17	Easton - Trappe	Line	DPL	\$0.7	\$0.1	\$0.0	\$0.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	212	0	
18	Church - I.B. Corners	Line	DPL	\$0.7	\$0.1	\$0.0	\$0.6	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.6	66	5	
20	Longwood - Wye Mills	Line	DPL	\$0.6	\$0.1	\$0.0	\$0.5	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.5	250	3	
22	Edgemoor - Harmony	Line	DPL	\$0.8	\$0.3	\$0.0	\$0.5	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	\$0.4	28	7	
23	Red Lion At20	Transformer	DPL	\$0.4	\$0.1	\$0.0	\$0.4	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.4	45	6	

Table 7-24 DPL Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	North Seaford - Pine Street	Line	DPL	\$21.2	\$5.4	\$0.1	\$16.0	(\$1.0)	(\$0.6)	(\$0.1)	(\$0.6)	\$15.4	690	147	
2	West	Interface	500	\$20.0	\$7.3	\$0.2	\$12.9	\$1.0	\$1.0	(\$0.0)	\$0.0	\$12.9	1,690	390	
3	AP South	Interface	500	\$23.0	\$11.0	\$0.2	\$12.2	\$1.5	\$1.2	(\$0.1)	\$0.2	\$12.4	3,572	1,016	
4	Cloverdale - Lexington	Line	AEP	\$14.4	\$4.7	\$0.1	\$9.9	\$1.0	(\$0.0)	(\$0.1)	\$0.9	\$10.8	3,529	1,813	
5	Kammer	Transformer	500	\$12.1	\$4.3	\$0.1	\$7.9	\$1.1	\$0.7	(\$0.1)	\$0.3	\$8.2	3,069	1,628	
6	East	Interface	500	\$9.2	\$3.4	\$0.1	\$5.9	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$5.9	758	12	
7	Central	Interface	500	\$7.6	\$3.4	\$0.0	\$4.3	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$4.3	726	42	
8	5004/5005 Interface	Interface	500	\$6.6	\$2.6	\$0.0	\$4.0	\$0.6	\$0.6	(\$0.1)	(\$0.1)	\$4.0	736	449	
9	Mount Storm - Pruntytown	Line	AP	\$5.6	\$2.3	\$0.1	\$3.5	\$0.3	\$0.2	(\$0.1)	\$0.0	\$3.5	2,559	812	
10	Sammis - Wylie Ridge	Line	AP	\$4.3	\$1.2	\$0.0	\$3.1	\$1.0	\$0.6	(\$0.1)	\$0.2	\$3.3	1,915	1,257	
11	Bedington - Black Oak	Interface	500	\$5.1	\$2.0	\$0.0	\$3.1	\$0.2	\$0.0	(\$0.0)	\$0.1	\$3.2	1,384	284	
12	Atlantic - Larrabee	Line	JCPL	(\$4.4)	(\$1.9)	(\$0.0)	(\$2.6)	(\$0.5)	(\$0.1)	\$0.1	(\$0.4)	(\$2.9)	1,556	380	
13	Dickerson - Pleasant View	Line	Pepco	\$4.7	\$2.2	\$0.1	\$2.6	\$0.1	(\$0.0)	(\$0.1)	(\$0.0)	\$2.6	844	218	
14	Red Lion At5n	Transformer	DPL	\$3.8	\$1.4	\$0.1	\$2.5	\$0.0	(\$0.1)	\$0.0	\$0.1	\$2.5	53	3	
15	Branchburg - Readington	Line	PSEG	(\$3.3)	(\$1.4)	(\$0.1)	(\$2.0)	(\$0.2)	\$0.3	\$0.1	(\$0.4)	(\$2.4)	1,121	271	
19	Longwood - Wye Mills	Line	DPL	\$1.1	\$0.2	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.0	228	0	
23	Keeney At5n	Transformer	DPL	\$5.6	\$2.0	\$0.0	\$3.6	\$0.2	\$2.1	(\$0.9)	(\$2.8)	\$0.8	157	134	
36	Middletown - Mt Pleasant	Line	DPL	\$0.5	\$0.1	\$0.0	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	28	0	
41	Bridgeville - Greenwood	Line	DPL	\$0.4	\$0.1	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	6	0	
48	Red Lion At20	Transformer	DPL	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.2	(\$0.0)	(\$0.0)	\$0.2	\$0.3	35	14	

JCPL Control Zone

Table 7-25 JCPL Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	5004/5005 Interface	Interface	500	\$9.5	\$4.0	\$0.0	\$5.5	\$0.2	(\$1.0)	(\$0.0)	\$1.2	\$6.6	776	294	
2	West	Interface	500	\$10.4	\$4.3	\$0.0	\$6.1	\$0.1	(\$0.2)	(\$0.0)	\$0.2	\$6.3	504	87	
3	Kammer	Transformer	500	\$8.2	\$3.5	\$0.0	\$4.8	\$0.1	(\$0.6)	(\$0.0)	\$0.7	\$5.4	3,674	1,328	
4	Wylie Ridge	Transformer	AP	\$3.9	\$1.4	\$0.0	\$2.5	\$0.1	(\$0.6)	(\$0.0)	\$0.7	\$3.2	354	335	
5	Atlantic - Larrabee	Line	JCPL	\$2.6	\$0.4	\$0.0	\$2.2	(\$0.6)	(\$0.4)	(\$0.0)	(\$0.2)	\$2.0	280	73	
6	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$3.0	\$1.3	(\$0.1)	\$1.6	(\$0.0)	(\$0.2)	\$0.0	\$0.2	\$1.7	2,949	910	
7	Sammis - Wylie Ridge	Line	AP	\$1.7	\$0.6	\$0.0	\$1.1	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.2	762	157	
8	Athenia - Saddlebrook	Line	PSEG	(\$1.3)	(\$0.3)	(\$0.0)	(\$1.0)	(\$0.0)	\$0.1	\$0.0	(\$0.1)	(\$1.1)	1,108	139	
9	Graceton - Raphael Road	Line	BGE	(\$2.7)	(\$1.5)	(\$0.0)	(\$1.2)	\$0.3	\$0.2	\$0.0	\$0.1	(\$1.0)	527	152	
10	East Frankfort - Crete	Line	ComEd	\$1.6	\$0.7	\$0.0	\$0.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.9	2,134	0	
11	Cloverdale - Lexington	Line	AEP	\$1.0	\$0.4	\$0.0	\$0.6	\$0.0	(\$0.0)	(\$0.0)	\$0.1	\$0.7	1,015	434	
12	Crete - St Johns Tap	Flowgate	Midwest ISO	\$1.1	\$0.5	\$0.0	\$0.6	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.7	1,565	306	
13	Tiltonville - Windsor	Line	AP	\$1.3	\$0.7	\$0.0	\$0.6	(\$0.0)	(\$0.1)	(\$0.0)	\$0.0	\$0.6	1,449	311	
14	Doubs	Transformer	AP	\$1.7	\$1.2	\$0.0	\$0.6	(\$0.0)	(\$0.1)	(\$0.0)	\$0.1	\$0.6	429	246	
15	Krendale - Seneca	Line	AP	\$0.9	\$0.4	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	324	0	
29	Gilbert - Morris Park	Line	JCPL	\$0.2	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	38	0	
47	Redoak - Sayreville	Line	JCPL	(\$0.0)	(\$0.1)	\$0.0	\$0.1	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.1	59	7	
82	Deep Run - Englishtown	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	0	2	
88	Franklin - West Wharton	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	35	0	
93	Kilmer - Sayreville	Line	JCPL	\$0.4	\$0.2	\$0.0	\$0.2	(\$0.0)	\$0.2	\$0.0	(\$0.2)	\$0.0	0	16	

Table 7-26 JCPL Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	Atlantic - Larrabee	Line	JCPL	\$47.5	\$2.2	\$2.2	\$47.5	(\$3.0)	\$2.8	(\$2.4)	(\$8.2)	\$39.3	1,556	380	
2	Branchburg - Readington	Line	PSEG	\$27.7	\$4.5	\$2.2	\$25.4	(\$2.2)	(\$0.8)	(\$1.8)	(\$3.3)	\$22.2	1,121	271	
3	West	Interface	500	\$29.5	\$11.9	\$0.3	\$17.9	\$0.1	(\$0.2)	(\$0.6)	(\$0.4)	\$17.6	1,690	390	
4	Cloverdale - Lexington	Line	AEP	\$18.8	\$5.2	\$0.7	\$14.4	\$0.6	(\$0.2)	(\$0.5)	\$0.3	\$14.6	3,529	1,813	
5	AP South	Interface	500	\$22.6	\$9.2	\$0.8	\$14.1	\$0.2	(\$0.4)	(\$1.0)	(\$0.4)	\$13.7	3,572	1,016	
6	Kammer	Transformer	500	\$18.0	\$6.3	\$0.4	\$12.2	\$0.5	(\$0.0)	(\$0.4)	\$0.2	\$12.4	3,069	1,628	
7	Central	Interface	500	\$12.2	\$3.6	\$0.5	\$9.0	\$0.0	(\$0.1)	(\$0.0)	\$0.0	\$9.1	726	42	
8	Branchburg - Flagtown	Line	PSEG	\$11.2	\$3.0	\$0.1	\$8.3	\$1.4	\$0.6	(\$0.1)	\$0.7	\$9.0	284	61	
9	5004/5005 Interface	Interface	500	\$11.7	\$4.2	\$0.3	\$7.8	\$0.4	(\$0.1)	(\$0.2)	\$0.3	\$8.1	736	449	
10	East	Interface	500	\$11.4	\$3.5	\$0.0	\$8.0	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$7.9	758	12	
11	Cedar Grove - Roseland	Line	PSEG	(\$9.4)	(\$1.7)	(\$0.2)	(\$7.9)	(\$0.4)	(\$0.4)	\$0.1	\$0.1	(\$7.8)	627	185	
12	Buckingham - Pleasant Valley	Line	PECO	\$10.7	\$3.8	\$0.2	\$7.1	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.1)	\$6.9	647	74	
13	Sammis - Wylie Ridge	Line	AP	\$5.9	\$1.8	\$0.1	\$4.2	\$0.6	\$0.0	(\$0.3)	\$0.3	\$4.4	1,915	1,257	
14	Dickerson - Pleasant View	Line	Pepco	\$6.0	\$2.3	\$0.2	\$3.9	\$0.0	(\$0.2)	(\$0.1)	\$0.1	\$4.0	844	218	
15	Redoak - Sayreville	Line	JCPL	\$0.2	(\$2.3)	\$0.0	\$2.5	\$0.2	(\$0.5)	\$0.4	\$1.1	\$3.6	254	30	
68	Gilbert - Hosensack	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.1)	0	10	
171	Kilmer - Sayreville	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	1	0	
182	Sayreville - Werner	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	0	2	
197	Franklin - West Wharton	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	17	0	
350	Franklin - Vernon	Line	JCPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	6	0	

Met-Ed Control Zone

Table 7-27 Met-Ed Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)								Grand Total	Event Hours		
				Load Payments	Day Ahead			Total	Load Payments	Balancing			Total	Day Ahead	Real Time
					Generation Credits	Explicit	Generation Credits			Explicit					
1	Kammer	Transformer	500	\$6.0	\$7.9	\$0.1	(\$1.8)	(\$0.0)	(\$0.3)	(\$0.1)	\$0.2	(\$1.6)	3,674	1,328	
2	Brunner Island - Yorkana	Line	Met-Ed	\$0.3	(\$0.7)	\$0.0	\$1.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$1.0	86	27	
3	Graceton - Raphael Road	Line	BGE	(\$2.1)	(\$3.0)	(\$0.0)	\$0.9	\$0.1	\$0.3	\$0.0	(\$0.2)	\$0.7	527	152	
4	AP South	Interface	500	\$2.5	\$1.8	\$0.0	\$0.7	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.7	3,501	604	
5	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$2.0	\$2.5	\$0.0	(\$0.5)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	(\$0.5)	2,949	910	
6	5004/5005 Interface	Interface	500	\$5.9	\$6.6	\$0.0	(\$0.6)	(\$0.1)	(\$0.3)	(\$0.0)	\$0.2	(\$0.4)	776	294	
7	Hunterstown	Transformer	Met-Ed	\$0.3	(\$0.1)	(\$0.0)	\$0.4	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$0.4	53	1	
8	West	Interface	500	\$7.4	\$7.2	\$0.0	\$0.3	\$0.0	(\$0.1)	(\$0.0)	\$0.1	\$0.3	504	87	
9	Tiltonsville - Windsor	Line	AP	\$0.9	\$1.3	\$0.0	(\$0.4)	\$0.0	(\$0.1)	(\$0.0)	\$0.1	(\$0.3)	1,449	311	
10	Wylie Ridge	Transformer	AP	\$3.1	\$2.8	\$0.0	\$0.3	(\$0.1)	(\$0.2)	(\$0.0)	\$0.0	\$0.3	354	335	
11	Middletown Jct - Yorkhaven	Line	Met-Ed	\$0.2	\$0.0	\$0.0	\$0.2	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.2	32	2	
12	Conastone	Transformer	BGE	(\$0.1)	(\$0.3)	(\$0.0)	\$0.2	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.2	75	12	
13	Hummelstown - Middletown Jct	Line	Met-Ed	\$0.1	\$0.3	\$0.0	(\$0.2)	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$0.2)	51	14	
14	Middletown Jct	Transformer	Met-Ed	\$0.3	(\$0.0)	\$0.0	\$0.3	(\$0.1)	\$0.0	(\$0.0)	(\$0.1)	\$0.2	62	12	
15	East Frankfort - Crete	Line	ComEd	\$1.1	\$1.3	\$0.0	(\$0.2)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.2)	2,134	0	
32	Collins - Middletown Jct	Line	Met-Ed	\$0.1	(\$0.1)	\$0.0	\$0.1	(\$0.0)	\$0.0	\$0.0	(\$0.1)	\$0.1	103	16	
36	Ironwood - South Lebanon	Line	Met-Ed	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	20	0	
42	Cly - Newberry	Line	Met-Ed	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	13	0	
69	Middletown Jct - S Lebanon	Line	Met-Ed	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	4	0	
157	Germantown	Transformer	Met-Ed	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	10	0	

Table 7-28 Met-Ed Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)								Grand Total	Event Hours		
				Load Payments	Day Ahead			Total	Load Payments	Balancing			Total	Day Ahead	Real Time
					Generation Credits	Explicit	Generation Credits			Explicit					
1	AP South	Interface	500	\$17.9	\$19.3	\$0.7	(\$0.8)	\$0.5	(\$0.2)	\$3.4	\$4.1	\$3.3	3,572	1,016	
2	Cloverdale - Lexington	Line	AEP	\$12.5	\$11.7	\$0.7	\$1.5	\$0.2	\$0.3	\$0.5	\$0.4	\$1.9	3,529	1,813	
3	Bedington	Transformer	AP	\$1.8	\$0.3	\$0.0	\$1.5	(\$0.0)	\$0.0	\$0.2	\$0.2	\$1.7	1,192	303	
4	Bedington - Black Oak	Interface	500	\$4.3	\$3.5	\$0.1	\$0.9	\$0.0	(\$0.0)	\$0.6	\$0.7	\$1.6	1,384	284	
5	Kammer	Transformer	500	\$10.4	\$11.1	\$0.5	(\$0.2)	\$0.2	(\$0.3)	\$1.3	\$1.8	\$1.5	3,069	1,628	
6	Brunner Island - Yorkana	Line	Met-Ed	\$0.5	(\$0.9)	\$0.0	\$1.4	\$0.1	\$0.1	(\$0.0)	(\$0.0)	\$1.4	57	27	
7	Conemaugh - Hunterstown	Line	500	\$0.6	\$1.5	\$0.0	(\$0.9)	(\$0.1)	(\$0.1)	(\$0.4)	(\$0.3)	(\$1.2)	62	98	
8	Middletown Jct	Transformer	Met-Ed	\$1.0	(\$0.1)	\$0.0	\$1.1	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	59	1	
9	Collins - Middletown Jct	Line	Met-Ed	\$1.0	(\$0.0)	\$0.0	\$1.1	(\$0.0)	\$0.2	\$0.1	(\$0.1)	\$1.0	272	31	
10	West	Interface	500	\$15.1	\$18.3	\$0.6	(\$2.6)	\$0.3	(\$0.2)	\$1.3	\$1.8	(\$0.9)	1,690	390	
11	Conastone	Transformer	BGE	\$0.4	(\$0.3)	(\$0.1)	\$0.7	\$0.0	\$0.1	\$0.1	\$0.0	\$0.7	95	15	
12	East Towanda	Transformer	PENELEC	\$0.3	\$0.4	\$0.0	\$0.0	\$0.1	(\$0.1)	\$0.4	\$0.6	\$0.6	803	306	
13	Aqueduct - Doubs	Line	AP	(\$0.8)	(\$0.2)	\$0.0	(\$0.6)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.6)	307	7	
14	Harwood - Susquehanna	Line	PPL	\$1.2	\$0.4	\$0.0	\$0.8	\$0.0	\$0.3	(\$0.0)	(\$0.2)	\$0.6	117	99	
15	Mount Storm - Pruntytown	Line	AP	\$4.6	\$4.4	\$0.2	\$0.4	(\$0.0)	\$0.0	\$0.2	\$0.2	\$0.6	2,559	812	
20	Hunterstown	Transformer	Met-Ed	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$0.1)	\$0.4	\$0.1	(\$0.4)	(\$0.4)	2	45	
21	Middletown Jct - Yorkhaven	Line	Met-Ed	\$0.3	(\$0.0)	\$0.0	\$0.4	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.3	32	7	
24	Carlisle Pike - Gardners	Line	Met-Ed	\$0.4	\$0.2	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	9	0	
27	Yorkana A	Transformer	Met-Ed	\$0.2	\$0.0	\$0.0	\$0.1	\$0.1	\$0.0	\$0.0	\$0.1	\$0.2	13	5	
31	Cly - Collins	Line	Met-Ed	\$0.3	\$0.1	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	18	0	

PECO Control Zone

Table 7-29 PECO Control Zone top congestion cost impacts (By facility): Calendar year 2009

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	Kammer	Transformer	500	\$3.7	\$9.8	\$0.0	(\$6.0)	(\$0.2)	(\$0.0)	\$0.0	(\$0.2)	(\$6.2)	3,674	1,328
2	West	Interface	500	\$3.3	\$7.1	\$0.0	(\$3.8)	(\$0.0)	(\$0.1)	(\$0.0)	\$0.0	(\$3.7)	504	87
3	AP South	Interface	500	\$0.5	\$3.7	\$0.0	(\$3.1)	(\$0.0)	\$0.0	\$0.0	(\$0.1)	(\$3.2)	3,501	604
4	5004/5005 Interface	Interface	500	\$4.9	\$7.9	\$0.0	(\$3.0)	\$0.0	(\$0.0)	\$0.0	\$0.1	(\$3.0)	776	294
5	Graceton - Raphael Road	Line	BGE	(\$1.4)	(\$4.4)	(\$0.0)	\$2.9	\$0.5	\$0.5	(\$0.0)	(\$0.0)	\$2.9	527	152
6	Doubs	Transformer	AP	\$1.0	\$3.3	\$0.0	(\$2.3)	(\$0.2)	\$0.2	\$0.0	(\$0.3)	(\$2.6)	429	246
7	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$1.5	\$3.6	(\$0.0)	(\$2.0)	(\$0.1)	\$0.1	(\$0.0)	(\$0.1)	(\$2.1)	2,949	910
8	East Frankfort - Crete	Line	ComEd	\$0.7	\$1.8	(\$0.0)	(\$1.1)	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.1)	2,134	0
9	Crete - St Johns Tap	Flowgate	Midwest ISO	\$0.4	\$1.4	(\$0.0)	(\$1.0)	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	(\$1.1)	1,565	306
10	Wylie Ridge	Transformer	AP	\$1.3	\$2.3	\$0.0	(\$0.9)	(\$0.1)	\$0.0	(\$0.1)	(\$0.1)	(\$1.1)	354	335
11	Conastone	Transformer	BGE	(\$0.1)	(\$1.0)	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.0	75	12
12	Sammis - Wylie Ridge	Line	AP	\$0.6	\$1.4	\$0.0	(\$0.9)	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	(\$0.9)	762	157
13	Tiltsville - Windsor	Line	AP	\$0.6	\$1.6	\$0.0	(\$0.9)	(\$0.0)	(\$0.0)	\$0.0	\$0.0	(\$0.9)	1,449	311
14	Cloverdale - Lexington	Line	AEP	\$0.4	\$1.2	\$0.0	(\$0.7)	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.8)	1,015	434
15	Holmesburg - Richmond	Line	PECO	(\$0.2)	(\$0.7)	(\$0.0)	\$0.5	(\$0.0)	(\$0.1)	\$0.0	\$0.1	\$0.6	428	40
19	Burlington - Croydon	Line	PECO	(\$0.3)	(\$0.7)	(\$0.0)	\$0.4	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.4	2,794	3
23	Emilie	Transformer	PECO	\$0.3	(\$1.9)	(\$0.0)	\$2.2	(\$0.2)	\$1.7	\$0.0	(\$1.9)	\$0.3	281	247
28	Eddystone - Scott Paper	Line	PECO	\$0.2	(\$0.0)	\$0.0	\$0.2	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.2	30	2
41	Buckingham - Pleasant Valley	Line	PECO	(\$0.4)	(\$0.4)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.1	\$0.0	(\$0.1)	(\$0.1)	131	60
44	Bryn Mawr - Plymouth Meeting	Line	PECO	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	5	0

Table 7-30 PECO Control Zone top congestion cost impacts (By facility): Calendar year 2008

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	AP South	Interface	500	\$8.2	\$27.7	\$0.0	(\$19.5)	\$0.0	\$1.2	\$0.0	(\$1.2)	(\$20.7)	3,572	1,016
2	West	Interface	500	\$9.4	\$23.1	\$0.1	(\$13.6)	\$0.1	\$1.7	\$0.0	(\$1.5)	(\$15.1)	1,690	390
3	East	Interface	500	\$10.0	\$0.4	(\$0.0)	\$9.7	(\$0.0)	(\$0.1)	\$0.0	\$0.1	\$9.7	758	12
4	Kammer	Transformer	500	\$6.7	\$13.9	\$0.0	(\$7.1)	\$0.4	\$1.1	\$0.0	(\$0.6)	(\$7.7)	3,069	1,628
5	Cloverdale - Lexington	Line	AEP	\$8.6	\$14.5	\$0.1	(\$5.8)	\$0.1	\$1.4	(\$0.0)	(\$1.4)	(\$7.1)	3,529	1,813
6	Mount Storm - Pruntytown	Line	AP	\$1.4	\$6.8	\$0.0	(\$5.4)	(\$0.1)	\$0.2	(\$0.0)	(\$0.3)	(\$5.7)	2,559	812
7	Bedington - Black Oak	Interface	500	\$1.6	\$6.2	\$0.0	(\$4.6)	(\$0.0)	\$0.2	\$0.0	(\$0.1)	(\$4.7)	1,384	284
8	5004/5005 Interface	Interface	500	\$3.5	\$7.3	\$0.0	(\$3.8)	\$0.2	\$0.7	(\$0.0)	(\$0.5)	(\$4.3)	736	449
9	Dickerson - Pleasant View	Line	Pepco	\$2.1	\$6.0	\$0.0	(\$3.9)	(\$0.1)	\$0.0	\$0.0	(\$0.1)	(\$4.0)	844	218
10	Sammis - Wylie Ridge	Line	AP	\$2.8	\$4.1	\$0.0	(\$1.2)	(\$0.1)	\$1.8	\$0.0	(\$1.9)	(\$3.1)	1,915	1,257
11	Branchburg - Readington	Line	PSEG	(\$1.9)	(\$4.6)	(\$0.0)	\$2.6	(\$0.0)	\$0.2	(\$0.0)	(\$0.3)	\$2.4	1,121	271
12	Conastone	Transformer	BGE	(\$0.2)	(\$2.4)	(\$0.0)	\$2.2	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$2.3	95	15
13	Unclassified	Unclassified	Unclassified	\$2.0	\$0.2	\$0.0	\$1.8	\$0.0	\$0.0	\$0.0	\$0.0	\$1.8	9,999	9,999
14	Bradford - Planebrook	Line	PECO	\$0.7	(\$1.1)	(\$0.0)	\$1.8	\$0.0	\$0.1	\$0.0	(\$0.1)	\$1.7	124	24
15	Whitpain	Transformer	PECO	\$3.8	(\$1.4)	\$0.1	\$5.2	(\$0.4)	\$2.8	(\$0.3)	(\$3.5)	\$1.7	89	68
17	Buckingham - Pleasant Valley	Line	PECO	(\$4.3)	(\$2.9)	(\$0.0)	(\$1.5)	\$0.1	\$0.1	\$0.0	(\$0.0)	(\$1.5)	647	74
18	Graceton - Peach Bottom	Line	PECO	\$0.4	\$0.1	\$0.0	\$0.3	(\$1.2)	\$0.5	\$0.0	(\$1.7)	(\$1.4)	33	163
24	North Philadelphia - Waneeta	Line	PECO	\$0.5	(\$0.5)	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.0	381	10
28	Trainer - Delco Tap	Line	PECO	\$0.8	\$0.1	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	2,218	0
30	Plymouth Meeting - Whitpain	Line	PECO	\$0.9	\$0.1	\$0.0	\$0.8	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.7	13	3

PENELEC Control Zone

Table 7-31 PENELEC Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Load Payments	Day Ahead			Load Payments	Balancing			Grand Total	Day Ahead	Real Time	
					Generation Credits	Explicit	Total		Generation Credits	Explicit	Total				
1	AP South	Interface	500	(\$17.8)	(\$35.0)	(\$0.1)	\$17.1	\$0.7	(\$0.2)	\$0.1	\$1.0	\$18.2	3,501	604	
2	West	Interface	500	(\$2.4)	(\$16.3)	(\$0.0)	\$13.9	\$0.0	\$0.1	\$0.0	(\$0.0)	\$13.9	504	87	
3	5004/5005 Interface	Interface	500	(\$3.5)	(\$18.7)	(\$0.0)	\$15.2	\$0.3	\$1.6	\$0.1	(\$1.3)	\$13.9	776	294	
4	Kammer	Transformer	500	\$4.8	\$15.9	\$0.2	(\$10.8)	(\$0.5)	(\$0.9)	(\$0.1)	\$0.2	(\$10.6)	3,674	1,328	
5	Wylie Ridge	Transformer	AP	\$1.5	\$10.3	\$0.1	(\$8.8)	(\$0.6)	(\$0.7)	(\$0.0)	\$0.1	(\$8.7)	354	335	
6	Seward	Transformer	PENELEC	\$8.0	\$4.6	(\$0.0)	\$3.4	\$0.0	\$0.0	\$0.0	\$0.0	\$3.4	283	0	
7	Sammis - Wylie Ridge	Line	AP	\$1.2	\$4.5	\$0.1	(\$3.3)	(\$0.1)	(\$0.1)	\$0.0	(\$0.0)	(\$3.3)	762	157	
8	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$4.1	\$7.6	(\$0.0)	(\$3.5)	\$0.2	(\$0.5)	\$0.0	\$0.6	(\$2.9)	2,949	910	
9	Mount Storm - Pruntytown	Line	AP	(\$2.4)	(\$4.6)	(\$0.0)	\$2.2	\$0.3	(\$0.1)	\$0.0	\$0.5	\$2.7	525	132	
10	Bedington - Black Oak	Interface	500	(\$2.3)	(\$4.4)	(\$0.0)	\$2.2	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$2.2	645	73	
11	Tiltonsville - Windsor	Line	AP	\$1.1	\$3.1	\$0.0	(\$2.0)	\$0.1	(\$0.0)	(\$0.0)	\$0.1	(\$2.0)	1,449	311	
12	East Frankfort - Crete	Line	ComEd	\$2.2	\$3.8	\$0.0	(\$1.6)	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.6)	2,134	0	
13	Homer City - Seward	Line	PENELEC	\$2.9	\$1.6	(\$0.0)	\$1.3	\$0.0	\$0.0	\$0.0	\$0.0	\$1.3	67	0	
14	Homer City - Shelocta	Line	PENELEC	(\$3.9)	(\$5.5)	(\$0.1)	\$1.6	(\$0.2)	\$0.1	\$0.0	(\$0.3)	\$1.3	386	103	
15	Krendale - Seneca	Line	AP	\$1.4	\$2.6	\$0.0	(\$1.2)	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.2)	324	0	
16	Homer City	Transformer	PENELEC	\$1.4	\$0.2	(\$0.0)	\$1.1	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$1.1	248	2	
18	Altoona - Bear Rock	Line	PENELEC	(\$1.9)	(\$3.0)	(\$0.0)	\$1.1	(\$0.1)	(\$0.1)	\$0.0	(\$0.1)	\$1.1	176	32	
27	Keystone - Shelocta	Line	PENELEC	(\$0.4)	(\$0.8)	(\$0.0)	\$0.4	\$0.1	\$0.1	\$0.0	(\$0.0)	\$0.4	104	43	
28	Altoona - Raystown	Line	PENELEC	(\$0.8)	(\$1.1)	(\$0.0)	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	55	0	
36	Bear Rock - Johnstown	Line	PENELEC	(\$0.5)	(\$0.7)	(\$0.0)	\$0.2	(\$0.1)	(\$0.1)	\$0.0	(\$0.0)	\$0.2	80	45	

Table 7-32 PENELEC Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Load Payments	Day Ahead			Load Payments	Balancing			Grand Total	Day Ahead	Real Time	
					Generation Credits	Explicit	Total		Generation Credits	Explicit	Total				
1	AP South	Interface	500	(\$35.4)	(\$69.6)	\$0.3	\$34.5	\$3.1	\$0.7	\$0.7	\$3.1	\$37.6	3,572	1,016	
2	West	Interface	500	(\$7.9)	(\$46.5)	(\$0.3)	\$38.2	\$0.1	\$1.5	\$0.3	(\$1.1)	\$37.1	1,690	390	
3	Mount Storm - Pruntytown	Line	AP	(\$27.4)	(\$55.5)	\$0.1	\$28.1	\$0.9	(\$0.3)	\$0.0	\$1.2	\$29.3	2,559	812	
4	Kammer	Transformer	500	\$10.1	\$33.1	\$0.8	(\$22.2)	(\$0.8)	(\$1.3)	\$0.2	\$0.7	(\$21.6)	3,069	1,628	
5	Bedington - Black Oak	Interface	500	(\$16.6)	(\$37.5)	\$0.1	\$20.9	\$0.6	\$0.3	\$0.1	\$0.4	\$21.4	1,384	284	
6	5004/5005 Interface	Interface	500	(\$3.8)	(\$23.7)	(\$0.1)	\$19.8	(\$0.7)	\$1.3	\$0.1	(\$1.8)	\$18.0	736	449	
7	Seward	Transformer	PENELEC	\$33.2	\$20.4	\$0.1	\$12.8	\$0.9	\$1.0	(\$0.1)	(\$0.1)	\$12.7	363	50	
8	Sammis - Wylie Ridge	Line	AP	\$6.2	\$17.6	\$0.6	(\$10.8)	(\$0.4)	(\$0.4)	(\$1.1)	(\$1.1)	(\$11.8)	1,915	1,257	
9	Mount Storm	Transformer	AP	(\$8.2)	(\$17.9)	\$0.1	\$9.7	(\$0.8)	\$0.0	(\$0.0)	(\$0.9)	\$8.8	935	469	
10	Krendale - Seneca	Line	AP	\$4.7	\$13.2	\$0.3	(\$8.3)	\$0.0	\$0.0	(\$0.0)	\$0.0	(\$8.2)	1,389	24	
11	Central	Interface	500	(\$0.5)	(\$8.6)	(\$0.0)	\$8.0	\$0.0	(\$0.0)	\$0.0	\$0.0	\$8.0	726	42	
12	East Towanda	Transformer	PENELEC	\$14.1	(\$8.8)	\$1.0	\$23.8	(\$9.2)	\$8.4	(\$0.5)	(\$18.1)	\$5.7	803	306	
13	East	Interface	500	(\$1.4)	(\$6.3)	(\$0.1)	\$4.9	\$0.0	(\$0.0)	\$0.0	\$0.0	\$4.9	758	12	
14	Bedington	Transformer	AP	(\$0.5)	(\$4.4)	\$0.0	\$3.9	\$0.0	\$0.1	\$0.0	(\$0.0)	\$3.9	1,192	303	
15	Altoona - Bear Rock	Line	PENELEC	(\$4.9)	(\$8.5)	(\$0.0)	\$3.6	\$0.1	\$0.1	(\$0.0)	(\$0.0)	\$3.6	221	30	
18	Blairsville East	Transformer	PENELEC	(\$4.5)	(\$6.6)	(\$0.0)	\$2.1	\$0.1	\$0.0	\$0.0	\$0.1	\$2.2	201	23	
21	Homer City - Shelocta	Line	PENELEC	(\$0.8)	(\$1.1)	(\$0.0)	\$0.3	\$1.4	(\$0.1)	\$0.0	\$1.6	\$1.8	74	163	
28	Homer City	Transformer	PENELEC	\$1.5	\$0.4	(\$0.0)	\$1.1	\$0.0	(\$0.0)	\$0.0	\$0.0	\$1.2	49	4	
31	Bear Rock - Johnstown	Line	PENELEC	(\$1.3)	(\$2.3)	(\$0.0)	\$1.0	\$0.2	\$0.0	\$0.0	\$0.1	\$1.1	138	24	
32	East Towanda - Grover	Line	PENELEC	(\$0.5)	(\$1.6)	(\$0.0)	\$1.1	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	109	0	

Pepco Control Zone

Table 7-33 Pepco Control Zone top congestion cost impacts (By facility): Calendar year 2009

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	AP South	Interface	500	\$57.5	\$42.6	\$1.1	\$16.0	(\$1.7)	(\$3.5)	(\$1.1)	\$0.7	\$16.7	3,501	604
2	Kammer	Transformer	500	\$21.9	\$15.1	\$0.3	\$7.1	(\$1.1)	(\$2.0)	(\$0.4)	\$0.5	\$7.6	3,674	1,328
3	Doubs	Transformer	AP	\$16.2	\$8.7	\$0.3	\$7.8	(\$1.7)	(\$0.2)	(\$0.3)	(\$1.7)	\$6.0	429	246
4	Buzzard - Ritchie	Line	Pepco	\$25.3	\$3.2	\$0.2	\$22.3	(\$13.9)	\$1.9	(\$0.6)	(\$16.4)	\$5.9	421	149
5	Unclassified	Unclassified	Unclassified	\$2.7	\$8.6	\$0.1	(\$5.9)	\$0.0	\$0.0	\$0.0	\$0.0	(\$5.9)	9,999	9,999
6	Graceton - Raphael Road	Line	BGE	\$6.7	\$4.2	\$0.2	\$2.6	(\$0.7)	(\$1.0)	(\$0.2)	\$0.2	\$2.8	527	152
7	Bedington - Black Oak	Interface	500	\$8.5	\$6.0	\$0.2	\$2.6	(\$0.0)	(\$0.1)	(\$0.0)	\$0.1	\$2.7	645	73
8	West	Interface	500	\$8.9	\$6.5	\$0.1	\$2.4	(\$0.1)	(\$0.2)	(\$0.0)	\$0.0	\$2.5	504	87
9	Mount Storm - Pruntytown	Line	AP	\$7.5	\$5.8	\$0.1	\$1.9	(\$0.2)	(\$0.8)	(\$0.1)	\$0.5	\$2.4	525	132
10	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$6.3	\$4.2	(\$0.0)	\$2.1	(\$0.2)	(\$0.5)	\$0.0	\$0.3	\$2.4	2,949	910
11	Cloverdale - Lexington	Line	AEP	\$6.0	\$4.3	\$0.1	\$1.8	(\$0.2)	(\$0.5)	(\$0.1)	\$0.2	\$1.9	1,015	434
12	Wylie Ridge	Transformer	AP	\$6.2	\$4.9	\$0.0	\$1.3	(\$0.3)	(\$0.7)	(\$0.0)	\$0.3	\$1.7	354	335
13	East Frankfort - Crete	Line	ComEd	\$3.1	\$2.0	\$0.0	\$1.1	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	2,134	0
14	Sammis - Wylie Ridge	Line	AP	\$3.1	\$2.2	\$0.1	\$1.0	(\$0.1)	(\$0.2)	(\$0.0)	\$0.0	\$1.0	762	157
15	Mount Storm	Transformer	AP	\$2.1	\$1.5	\$0.0	\$0.7	\$0.0	(\$0.3)	(\$0.1)	\$0.2	\$0.9	151	80
20	Alabama Ave. - Palmers Corner	Line	Pepco	\$0.5	\$0.0	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	12	0
25	Brighton	Transformer	Pepco	\$0.7	\$0.4	\$0.0	\$0.3	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.3	43	1
29	Dickerson - Pleasant View	Line	Pepco	\$0.8	\$0.5	\$0.0	\$0.3	(\$0.3)	(\$0.2)	(\$0.1)	(\$0.1)	\$0.2	54	30
38	Burtonsville - Oak Grove	Line	Pepco	(\$0.3)	(\$0.4)	(\$0.0)	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	29	0
49	Oak Grove - Ritchie	Line	Pepco	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.1)	(\$0.0)	\$0.1	\$0.1	0	6

Table 7-34 Pepco Control Zone top congestion cost impacts (By facility): Calendar year 2008

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	AP South	Interface	500	\$186.4	\$129.8	\$1.8	\$58.4	(\$2.6)	(\$1.4)	(\$1.8)	(\$2.9)	\$55.5	3,572	1,016
2	Cloverdale - Lexington	Line	AEP	\$91.0	\$64.8	\$1.8	\$28.1	\$5.9	(\$1.2)	(\$1.7)	\$5.4	\$33.5	3,529	1,813
3	Mount Storm - Pruntytown	Line	AP	\$86.7	\$61.8	\$0.6	\$25.5	\$0.8	(\$1.5)	(\$0.3)	\$2.0	\$27.5	2,559	812
4	Bedington - Black Oak	Interface	500	\$58.9	\$40.0	\$0.6	\$19.5	(\$0.3)	\$0.0	(\$0.3)	(\$0.7)	\$18.8	1,384	284
5	Aqueduct - Doubs	Line	AP	\$38.5	\$23.5	\$0.2	\$15.2	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$15.3	307	7
6	Kammer	Transformer	500	\$36.9	\$24.5	\$0.7	\$13.1	(\$0.3)	(\$0.9)	(\$0.7)	(\$0.0)	\$13.1	3,069	1,628
7	Dickerson - Pleasant View	Line	Pepco	\$34.0	\$23.1	\$1.2	\$12.1	(\$0.2)	(\$0.1)	(\$1.1)	(\$1.1)	\$11.0	844	218
8	West	Interface	500	\$25.0	\$15.6	\$0.6	\$10.0	(\$0.3)	(\$0.5)	(\$0.6)	(\$0.4)	\$9.6	1,690	390
9	Mount Storm	Transformer	AP	\$25.8	\$19.0	\$0.1	\$6.9	\$2.0	(\$0.5)	(\$0.1)	\$2.5	\$9.3	935	469
10	Brighton	Transformer	Pepco	\$11.7	\$7.4	\$0.2	\$4.5	(\$0.7)	(\$0.3)	(\$0.8)	(\$1.2)	\$3.3	116	78
11	Sammis - Wylie Ridge	Line	AP	\$9.3	\$6.3	\$0.1	\$3.1	\$0.7	\$0.2	(\$0.4)	\$0.1	\$3.2	1,915	1,257
12	Buzzard - Ritchie	Line	Pepco	\$1.1	\$0.1	\$0.1	\$1.1	(\$0.6)	\$0.7	(\$0.2)	(\$1.5)	(\$0.4)	57	32
13	Dickerson - Quince Orchard	Line	Pepco	\$3.4	\$1.1	\$0.0	\$2.4	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$2.4	46	2
14	Black Oak	Transformer	AP	\$6.8	\$4.6	\$0.0	\$2.2	(\$0.0)	(\$0.1)	(\$0.0)	\$0.1	\$2.3	386	29
15	Central	Interface	500	(\$8.1)	(\$6.0)	(\$0.1)	(\$2.1)	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$2.1)	726	42
29	Bells Mill	Transformer	Pepco	\$1.4	\$0.5	\$0.0	\$0.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.9	7	0
32	Aqueduct - Dickerson	Line	Pepco	\$2.0	\$1.3	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	10	0
38	Pumphrey - Westport	Line	Pepco	(\$1.6)	(\$1.1)	(\$0.0)	(\$0.5)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.5)	1,092	0
47	Dickerson - Doubs	Line	Pepco	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.3	(\$0.1)	(\$0.3)	(\$0.3)	2	8
61	Quince Orchard	Transformer	Pepco	\$0.2	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	2	0

PPL Control Zone

Table 7-35 PPL Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)											Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours					
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time			
1	Kammer	Transformer	500	\$1.7	\$5.5	\$0.6	(\$3.2)	(\$0.2)	(\$0.2)	(\$0.1)	(\$0.0)	(\$3.2)	3,674	1,328			
2	5004/5005 Interface	Interface	500	\$2.9	\$7.0	\$0.5	(\$3.5)	\$0.0	(\$0.8)	(\$0.0)	\$0.7	(\$2.8)	776	294			
3	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$0.6	\$2.3	(\$0.1)	(\$1.8)	(\$0.2)	(\$0.2)	\$0.0	\$0.0	(\$1.8)	2,949	910			
4	AP South	Interface	500	\$0.5	(\$0.6)	\$0.3	\$1.4	\$0.1	(\$0.1)	\$0.1	\$0.3	\$1.7	3,501	604			
5	Graceton - Raphael Road	Line	BGE	(\$0.9)	(\$2.3)	(\$0.1)	\$1.3	\$0.1	\$0.1	\$0.0	\$0.1	\$1.4	527	152			
6	Hummelstown - Middletown Jct	Line	Met-Ed	\$1.0	(\$0.0)	\$0.0	\$1.1	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.1	51	14			
7	West	Interface	500	\$3.0	\$4.6	\$0.5	(\$1.1)	(\$0.0)	(\$0.2)	(\$0.0)	\$0.1	(\$0.9)	504	87			
8	Brunner Island - Yorkana	Line	Met-Ed	(\$0.0)	(\$0.9)	(\$0.0)	\$0.8	\$0.0	\$0.1	(\$0.0)	(\$0.0)	\$0.8	86	27			
9	Sammis - Wylie Ridge	Line	AP	\$0.2	\$1.0	\$0.1	(\$0.7)	\$0.0	(\$0.0)	\$0.0	\$0.0	(\$0.7)	762	157			
10	Harwood - Susquehanna	Line	PPL	\$0.2	(\$0.5)	\$0.0	\$0.7	(\$0.0)	\$0.0	\$0.0	(\$0.1)	\$0.7	31	10			
11	East Frankfort - Crete	Line	ComEd	\$0.4	\$1.0	\$0.0	(\$0.6)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.6)	2,134	0			
12	Crete - St Johns Tap	Flowgate	Midwest ISO	\$0.4	\$0.8	(\$0.0)	(\$0.4)	(\$0.1)	(\$0.1)	\$0.0	(\$0.0)	(\$0.5)	1,565	306			
13	Atlantic - Larrabee	Line	JCPL	\$0.1	\$0.1	(\$0.0)	(\$0.0)	(\$0.1)	\$0.1	\$0.0	(\$0.3)	(\$0.3)	280	73			
14	Wylie Ridge	Transformer	AP	\$1.1	\$1.8	\$0.3	(\$0.4)	\$0.2	\$0.1	\$0.0	\$0.1	(\$0.3)	354	335			
15	PL North	Interface	PPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	\$0.6	(\$0.0)	(\$0.3)	(\$0.3)	0	176			
27	Jenkins - Susquehanna	Line	PPL	\$0.1	(\$0.1)	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	12	0			
47	Dauphin - Juniata	Line	PPL	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	6	4			
58	Eldred - Sunbury	Line	PPL	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	4	0			
60	Harwood	Transformer	PPL	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$0.0	15	1			
129	Quarry - Steel City	Line	PPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	0	5			

Table 7-36 PPL Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)											Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours					
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time			
1	Harwood - Susquehanna	Line	PPL	\$2.7	(\$14.5)	(\$0.1)	\$17.1	(\$1.2)	\$2.0	\$0.2	(\$3.0)	\$14.1	117	99			
2	West	Interface	500	\$2.7	\$13.2	\$1.6	(\$8.9)	\$0.2	\$1.0	(\$0.2)	(\$1.0)	(\$9.9)	1,690	390			
3	Cloverdale - Lexington	Line	AEP	\$1.4	\$9.0	\$1.7	(\$5.8)	(\$0.2)	\$0.0	(\$0.1)	(\$0.3)	(\$6.2)	3,529	1,813			
4	East Towanda	Transformer	PENELEC	\$0.4	\$1.8	\$0.0	(\$1.4)	\$0.1	\$1.1	(\$2.9)	(\$3.8)	(\$5.2)	803	306			
5	East	Interface	500	\$0.2	(\$4.6)	(\$0.0)	\$4.8	\$0.0	(\$0.0)	\$0.0	\$0.0	\$4.8	758	12			
6	Kammer	Transformer	500	\$1.9	\$7.4	\$1.4	(\$4.1)	\$0.2	\$0.4	(\$0.3)	(\$0.5)	(\$4.7)	3,069	1,628			
7	Sammis - Wylie Ridge	Line	AP	\$0.3	\$4.1	\$0.6	(\$3.2)	\$0.0	\$0.1	(\$0.8)	(\$0.9)	(\$4.1)	1,915	1,257			
8	Central	Interface	500	\$0.8	\$4.9	\$0.4	(\$3.7)	(\$0.0)	(\$0.1)	(\$0.0)	\$0.1	(\$3.6)	726	42			
9	5004/5005 Interface	Interface	500	\$1.5	\$5.6	\$0.8	(\$3.3)	(\$0.2)	(\$0.2)	(\$0.3)	(\$0.3)	(\$3.6)	736	449			
10	Mount Storm - Pruntytown	Line	AP	\$1.8	(\$0.8)	\$1.0	\$3.5	\$0.1	\$0.2	(\$0.1)	(\$0.1)	\$3.4	2,559	812			
11	Krendale - Seneca	Line	AP	\$0.4	\$2.4	\$0.3	(\$1.7)	(\$0.0)	\$0.0	\$0.0	(\$0.0)	(\$1.7)	1,389	24			
12	Bedington - Black Oak	Interface	500	\$1.6	\$0.6	\$0.5	\$1.5	\$0.1	\$0.0	\$0.1	\$0.1	\$1.6	1,384	284			
13	Branchburg - Readington	Line	PSEG	\$0.7	(\$0.8)	(\$0.1)	\$1.4	\$0.0	(\$0.1)	\$0.1	\$0.2	\$1.6	1,121	271			
14	Conastone	Transformer	BGE	\$0.1	(\$1.2)	(\$0.0)	\$1.2	\$0.0	(\$0.0)	\$0.0	\$0.1	\$1.3	95	15			
15	Burnham - Munster	Line	ComEd	\$0.3	\$1.5	(\$0.0)	(\$1.3)	\$0.0	(\$0.1)	\$0.0	\$0.2	(\$1.1)	476	140			
19	Lackawana - Stanton	Line	PPL	\$0.0	(\$0.5)	\$0.4	\$0.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.8	83	0			
28	Martins Creek - Siegfried	Line	PPL	(\$0.0)	(\$0.8)	(\$0.0)	\$0.8	(\$0.0)	\$0.4	(\$0.0)	(\$0.5)	\$0.3	28	61			
31	Wescosville	Transformer	PPL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	(\$0.1)	\$0.0	\$0.3	\$0.3	0	9			
37	Frackville - Siegfried	Line	PPL	(\$0.0)	(\$0.3)	(\$0.0)	\$0.3	\$0.0	\$0.1	(\$0.0)	(\$0.1)	\$0.2	27	55			
39	Susquehanna	Transformer	PPL	\$0.3	\$0.0	(\$0.0)	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	5	0			

PSEG Control Zone

Table 7-37 PSEG Control Zone top congestion cost impacts (By facility): Calendar year 2009

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	Leonia - New Milford	Line	PSEG	\$2.1	\$0.8	\$3.1	\$4.4	(\$0.0)	\$0.0	(\$0.3)	(\$0.3)	\$4.1	3,847	39
2	Athenia - Saddlebrook	Line	PSEG	\$3.2	\$0.6	\$1.3	\$4.0	(\$0.2)	\$0.1	(\$0.5)	(\$0.8)	\$3.2	1,108	139
3	Plainsboro - Trenton	Line	PSEG	\$3.5	(\$0.1)	\$0.1	\$3.8	(\$0.3)	\$0.4	(\$0.1)	(\$0.7)	\$3.1	389	164
4	Cedar Grove - Clifton	Line	PSEG	\$2.3	\$0.5	\$1.0	\$2.8	(\$0.1)	\$0.0	(\$0.1)	(\$0.2)	\$2.6	1,194	38
5	AP South	Interface	500	\$0.2	\$3.5	\$1.1	(\$2.2)	\$0.1	(\$0.2)	(\$0.5)	(\$0.2)	(\$2.4)	3,501	604
6	Fairlawn - Saddlebrook	Line	PSEG	\$1.1	\$0.2	\$0.6	\$1.6	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	945	0
7	West	Interface	500	\$11.8	\$13.8	\$0.9	(\$1.1)	(\$0.1)	\$0.1	(\$0.2)	(\$0.3)	(\$1.4)	504	87
8	Wylie Ridge	Transformer	AP	\$4.3	\$5.4	\$0.5	(\$0.6)	\$0.0	\$0.1	(\$0.6)	(\$0.7)	(\$1.3)	354	335
9	Hillsdale - Waldwick	Line	PSEG	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.4	(\$0.5)	(\$1.0)	(\$1.0)	0	59
10	Monroe - New Freedom	Line	AECO	(\$0.1)	(\$1.1)	(\$0.0)	\$0.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.9	584	0
11	Bayway - Federal Square	Line	PSEG	\$0.5	(\$0.3)	\$0.0	\$0.8	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.8	220	11
12	Buckingham - Pleasant Valley	Line	PECO	\$0.9	(\$0.1)	\$0.0	\$1.0	(\$0.0)	\$0.2	(\$0.0)	(\$0.3)	\$0.7	131	60
13	Atlantic - Larrabee	Line	JCPL	\$0.6	(\$0.7)	\$0.0	\$1.3	(\$0.0)	\$0.6	(\$0.1)	(\$0.7)	\$0.7	280	73
14	Brunswick - Edison	Line	PSEG	\$1.0	(\$0.0)	\$0.0	\$1.1	(\$0.1)	\$0.2	(\$0.2)	(\$0.5)	\$0.6	138	76
15	Cedar Grove - Roseland	Line	PSEG	\$0.4	\$0.0	\$0.0	\$0.4	(\$0.2)	\$0.5	(\$0.2)	(\$0.9)	(\$0.5)	64	71
16	Bayonne - PVSC	Line	PSEG	\$0.0	(\$0.4)	\$0.0	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	686	0
17	Branchburg - Flagtown	Line	PSEG	\$0.6	(\$0.0)	\$0.1	\$0.7	(\$0.0)	\$0.1	(\$0.1)	(\$0.2)	\$0.4	161	16
18	Athenia - Fairlawn	Line	PSEG	\$0.4	\$0.0	\$0.0	\$0.4	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.4	165	6
22	East Windsor - Windsor	Line	PSEG	\$0.1	(\$0.3)	\$0.0	\$0.3	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.4	107	3
24	Sewaren	Transformer	PSEG	\$0.3	(\$0.0)	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	89	0

Table 7-38 PSEG Control Zone top congestion cost impacts (By facility): Calendar year 2008

Congestion Costs (Millions)														
No.	Constraint	Type	Location	Day Ahead				Balancing				Event Hours		
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Grand Total	Day Ahead	Real Time
1	Atlantic - Larrabee	Line	JCPL	\$13.3	(\$6.0)	\$0.4	\$19.7	\$0.5	\$2.7	(\$0.9)	(\$3.1)	\$16.6	1,556	380
2	Branchburg - Readington	Line	PSEG	\$17.0	\$0.8	\$0.8	\$17.0	\$0.2	\$2.9	(\$0.7)	(\$3.3)	\$13.6	1,121	271
3	Buckingham - Pleasant Valley	Line	PECO	\$11.4	\$2.4	\$0.6	\$9.6	(\$0.1)	\$0.4	(\$0.1)	(\$0.6)	\$9.0	647	74
4	Cedar Grove - Roseland	Line	PSEG	\$12.6	\$1.9	\$0.5	\$11.3	(\$0.0)	\$2.7	(\$0.9)	(\$3.6)	\$7.7	627	185
5	Branchburg - Flagtown	Line	PSEG	\$6.9	\$0.1	\$0.2	\$6.9	\$0.4	(\$0.0)	(\$0.4)	(\$0.0)	\$6.9	284	61
6	Unclassified	Unclassified	Unclassified	\$3.7	(\$2.9)	\$0.2	\$6.8	\$0.0	\$0.0	\$0.0	\$0.0	\$6.8	9,999	9,999
7	AP South	Interface	500	\$25.3	\$31.6	\$3.9	(\$2.4)	(\$0.1)	\$1.0	(\$2.2)	(\$3.3)	(\$5.7)	3,572	1,016
8	Brunswick - Edison	Line	PSEG	\$5.6	\$0.3	\$0.3	\$5.6	(\$0.0)	\$0.6	(\$0.3)	(\$0.9)	\$4.6	535	293
9	Mount Storm - Pruntytown	Line	AP	\$1.7	\$6.6	\$1.9	(\$2.9)	\$0.1	(\$0.2)	(\$1.5)	(\$1.2)	(\$4.1)	2,559	812
10	Trainer - Delco Tap	Line	PECO	(\$2.2)	(\$5.9)	(\$0.1)	\$3.6	\$0.0	\$0.0	\$0.0	\$0.0	\$3.6	2,218	0
11	Cloverdale - Lexington	Line	AEP	\$22.1	\$24.9	\$2.8	(\$0.0)	\$0.4	\$1.9	(\$2.0)	(\$3.5)	(\$3.5)	3,529	1,813
12	Sammis - Wylie Ridge	Line	AP	\$7.5	\$8.1	\$1.0	\$0.4	\$0.8	\$1.9	(\$2.7)	(\$3.7)	(\$3.3)	1,915	1,257
13	Bedington - Black Oak	Interface	500	\$3.8	\$7.3	\$1.0	(\$2.4)	\$0.0	(\$0.0)	(\$0.4)	(\$0.4)	(\$2.8)	1,384	284
14	Leonia - New Milford	Line	PSEG	\$1.7	\$0.4	\$2.5	\$3.8	(\$0.2)	\$0.7	(\$0.5)	(\$1.3)	\$2.5	919	84
15	Athenia - Fairlawn	Line	PSEG	\$2.0	\$0.3	\$0.7	\$2.4	(\$0.0)	\$0.0	(\$0.3)	(\$0.3)	\$2.1	428	36
16	North Ave - Pvsc	Line	PSEG	\$0.6	(\$1.1)	\$0.1	\$1.8	\$0.0	\$0.0	\$0.0	\$0.0	\$1.8	592	0
19	Linden - North Ave	Line	PSEG	\$0.7	(\$0.7)	\$0.1	\$1.6	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.6	484	23
20	Lawrence - Pleasant Valley	Line	PSEG	\$2.3	\$0.6	\$0.3	\$2.0	\$0.1	\$0.4	(\$0.2)	(\$0.5)	\$1.6	142	39
21	Meadow Rd - Metuchen	Line	PSEG	\$1.6	\$0.1	\$0.1	\$1.5	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$1.5	133	4
24	Bergen - Hoboken	Line	PSEG	\$0.4	(\$0.3)	\$0.6	\$1.3	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	\$1.2	188	5

RECO Control Zone

Table 7-39 RECO Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours				
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total					
1	West	Interface	500	\$0.5	\$0.0	\$0.0	\$0.6	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.5	504	87		
2	5004/5005 Interface	Interface	500	\$0.5	\$0.0	\$0.0	\$0.5	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.1)	\$0.4	776	294		
3	Kammer	Transformer	500	\$0.4	\$0.0	\$0.0	\$0.4	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.4	3,674	1,328		
4	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$0.2	\$0.0	(\$0.0)	\$0.2	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.2	2,949	910		
5	Wylie Ridge	Transformer	AP	\$0.2	\$0.0	\$0.0	\$0.2	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.2	354	335		
6	Graceton - Raphael Road	Line	BGE	(\$0.2)	(\$0.0)	(\$0.0)	(\$0.2)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.2)	527	152		
7	AP South	Interface	500	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	(\$0.0)	\$0.0	\$0.0	(\$0.0)	(\$0.1)	3,501	604		
8	Athenia - Saddlebrook	Line	PSEG	\$0.1	(\$0.0)	\$0.0	\$0.1	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$0.1	1,108	139		
9	East Frankfort - Crete	Line	ComEd	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	2,134	0		
10	Doubs	Transformer	AP	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.1	429	246		
11	Sammis - Wylie Ridge	Line	AP	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	\$0.1	762	157		
12	Crete - St Johns Tap	Flowgate	Midwest ISO	\$0.1	\$0.0	(\$0.0)	\$0.1	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.1	1,565	306		
13	Tiltonville - Windsor	Line	AP	\$0.1	\$0.0	\$0.0	\$0.1	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.1	1,449	311		
14	Fairlawn - Saddlebrook	Line	PSEG	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	945	0		
15	Krendale - Seneca	Line	AP	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	324	0		

Table 7-40 RECO Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)										Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours				
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total					
1	West	Interface	500	\$1.4	\$0.0	\$0.2	\$1.6	\$0.1	(\$0.0)	(\$0.4)	(\$0.3)	\$1.3	1,690	390		
2	Branchburg - Readington	Line	PSEG	\$1.0	\$0.0	\$0.0	\$1.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.0	1,121	271		
3	Cedar Grove - Roseland	Line	PSEG	\$0.8	\$0.0	\$0.0	\$0.8	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$0.9	627	185		
4	Kammer	Transformer	500	\$0.8	\$0.0	\$0.1	\$0.9	\$0.0	(\$0.0)	(\$0.1)	(\$0.0)	\$0.9	3,069	1,628		
5	Cloverdale - Lexington	Line	AEP	\$0.7	\$0.0	\$0.2	\$0.8	\$0.0	(\$0.0)	(\$0.1)	(\$0.1)	\$0.8	3,529	1,813		
6	AP South	Interface	500	\$0.7	\$0.0	\$0.1	\$0.7	\$0.0	(\$0.0)	(\$0.1)	(\$0.1)	\$0.6	3,572	1,016		
7	Atlantic - Larrabee	Line	JCPL	\$0.6	\$0.0	\$0.0	\$0.6	\$0.0	(\$0.0)	(\$0.1)	(\$0.0)	\$0.5	1,556	380		
8	Central	Interface	500	\$0.5	\$0.0	\$0.0	\$0.5	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.5	726	42		
9	East	Interface	500	\$0.5	\$0.0	\$0.0	\$0.5	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.5	758	12		
10	Buckingham - Pleasant Valley	Line	PECO	\$0.5	\$0.0	\$0.0	\$0.5	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.5	647	74		
11	5004/5005 Interface	Interface	500	\$0.5	\$0.0	\$0.1	\$0.6	\$0.0	(\$0.0)	(\$0.3)	(\$0.3)	\$0.3	736	449		
12	Krendale - Seneca	Line	AP	\$0.2	\$0.0	\$0.1	\$0.3	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.3	1,389	24		
13	Dickerson - Pleasant View	Line	Pepco	\$0.3	\$0.0	\$0.0	\$0.3	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.3	844	218		
14	Cedar Grove - Clifton	Line	PSEG	\$0.2	\$0.0	\$0.0	\$0.2	\$0.1	(\$0.0)	(\$0.0)	\$0.1	\$0.3	793	445		
15	Burnham - Munster	Line	ComEd	\$0.2	\$0.0	\$0.0	\$0.2	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.2	476	140		

Western Region Congestion-Event Summaries

AEP Control Zone

Table 7-41 AEP Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	AP South	Interface	500	(\$20.1)	(\$39.8)	\$1.2	\$20.9	(\$1.2)	\$0.4	\$0.5	(\$1.1)	\$19.7	3,501	604	
2	Kammer	Transformer	500	(\$20.6)	(\$34.6)	(\$0.6)	\$13.4	(\$0.8)	\$2.5	\$0.4	(\$2.9)	\$10.6	3,674	1,328	
3	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$17.5	\$8.9	\$1.1	\$9.7	(\$2.6)	(\$1.1)	(\$2.4)	(\$3.9)	\$5.8	2,949	910	
4	Ruth - Turner	Line	AEP	\$4.9	(\$1.6)	\$0.5	\$7.0	(\$1.4)	(\$0.4)	(\$0.1)	(\$1.2)	\$5.8	704	313	
5	Kanawha - Kincaid	Line	AEP	\$2.8	(\$2.1)	\$0.2	\$5.1	\$0.0	\$0.0	\$0.0	\$0.0	\$5.1	291	0	
6	Kammer - Ormet	Line	AEP	\$7.8	\$1.1	\$0.3	\$6.9	(\$1.6)	\$0.5	(\$0.1)	(\$2.2)	\$4.7	552	509	
7	AEP-DOM	Interface	500	\$1.3	(\$3.7)	\$0.4	\$5.3	(\$0.2)	\$0.5	(\$0.0)	(\$0.8)	\$4.5	325	136	
8	Kanawha River	Transformer	AEP	\$3.3	(\$0.3)	\$0.5	\$4.1	\$0.1	(\$0.3)	(\$0.1)	\$0.4	\$4.4	163	37	
9	Kanawha River - Bradley	Line	AEP	\$1.3	(\$2.2)	\$0.2	\$3.8	(\$0.0)	\$0.1	\$0.0	(\$0.1)	\$3.7	24	15	
10	Breed - Wheatland	Line	AEP	\$0.1	(\$3.9)	(\$0.5)	\$3.5	\$0.0	\$0.0	\$0.0	\$0.0	\$3.5	591	2	
11	5004/5005 Interface	Interface	500	(\$9.2)	(\$12.9)	\$0.0	\$3.7	\$0.1	\$0.6	\$0.1	(\$0.3)	\$3.4	776	294	
12	East Frankfort - Crete	Line	ComEd	\$4.6	\$2.9	\$1.5	\$3.2	\$0.0	\$0.0	\$0.0	\$0.0	\$3.2	2,134	0	
13	Sammis - Wylie Ridge	Line	AP	(\$5.0)	(\$3.1)	(\$0.1)	(\$2.0)	(\$0.3)	\$0.2	(\$0.0)	(\$0.5)	(\$2.6)	762	157	
14	Bedington - Black Oak	Interface	500	(\$2.8)	(\$5.1)	\$0.1	\$2.4	(\$0.1)	(\$0.0)	\$0.0	(\$0.0)	\$2.3	645	73	
15	Mount Storm - Pruntytown	Line	AP	(\$3.1)	(\$5.2)	\$0.2	\$2.3	\$0.0	\$0.2	\$0.1	(\$0.1)	\$2.2	525	132	
18	Cloverdale - Lexington	Line	AEP	(\$7.0)	(\$5.1)	(\$0.4)	(\$2.3)	\$0.4	\$0.2	\$0.2	\$0.4	(\$1.9)	1,015	434	
21	Axton	Transformer	AEP	\$0.3	(\$0.8)	\$0.1	\$1.2	(\$0.1)	\$0.1	\$0.0	(\$0.2)	\$1.1	116	12	
29	Poston - Postel Tap	Line	AEP	\$0.4	(\$0.6)	\$0.2	\$1.2	\$0.1	\$0.5	(\$0.0)	(\$0.4)	\$0.8	148	118	
30	Marquis - Waverly	Line	AEP	\$0.7	\$0.0	\$0.1	\$0.7	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.7	74	14	
33	Kanawha River - Kincaid	Line	AEP	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	(\$0.1)	\$0.1	\$0.5	\$0.5	0	105	

Table 7-42 AEP Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)										Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time	
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total				
1	AP South	Interface	500	(\$88.3)	(\$149.7)	\$2.4	\$63.8	(\$15.1)	\$0.6	\$0.3	(\$15.4)	\$48.4	3,572	1,016	
2	Mount Storm - Pruntytown	Line	AP	(\$28.8)	(\$71.8)	\$3.8	\$46.9	(\$9.2)	\$0.4	(\$0.4)	(\$9.9)	\$36.9	2,559	812	
3	Kammer	Transformer	500	(\$31.2)	(\$80.1)	(\$0.5)	\$48.3	(\$10.1)	\$3.9	\$0.4	(\$13.5)	\$34.8	3,069	1,628	
4	Bedington - Black Oak	Interface	500	(\$21.7)	(\$47.4)	\$2.1	\$27.8	(\$2.5)	\$0.9	\$0.0	(\$3.4)	\$24.4	1,384	284	
5	Axton	Transformer	AEP	\$2.8	(\$13.0)	\$2.2	\$18.1	\$0.0	\$0.0	\$0.0	\$0.0	\$18.1	425	0	
6	West	Interface	500	(\$23.8)	(\$41.1)	\$0.2	\$17.5	(\$3.3)	\$0.9	\$0.1	(\$4.1)	\$13.4	1,690	390	
7	Sammis - Wylie Ridge	Line	AP	(\$17.1)	(\$9.7)	(\$0.3)	(\$7.7)	(\$4.3)	(\$0.5)	(\$1.4)	(\$5.2)	(\$12.9)	1,915	1,257	
8	Mount Storm	Transformer	AP	(\$8.9)	(\$23.7)	\$1.4	\$16.2	(\$5.2)	(\$1.6)	(\$0.2)	(\$3.8)	\$12.5	935	469	
9	Cloverdale - Lexington	Line	AEP	(\$96.5)	(\$104.8)	(\$6.0)	\$2.3	(\$16.0)	(\$3.7)	\$0.9	(\$11.4)	(\$9.1)	3,529	1,813	
10	Amos	Transformer	AEP	\$5.9	(\$1.6)	\$0.2	\$7.7	\$0.4	\$0.6	\$0.1	(\$0.2)	\$7.5	31	19	
11	Mahans Lane - Tidd	Line	AEP	(\$2.0)	(\$4.8)	\$2.8	\$5.6	\$0.1	\$0.2	\$0.0	(\$0.0)	\$5.6	847	217	
12	Bedington	Transformer	AP	(\$4.7)	(\$8.9)	\$0.3	\$4.5	(\$0.5)	\$0.1	(\$0.0)	(\$0.6)	\$3.9	1,192	303	
13	Breed - Wheatland	Line	AEP	\$0.1	(\$3.9)	(\$0.4)	\$3.5	\$0.0	(\$0.0)	\$0.0	\$0.0	\$3.5	338	1	
14	Central	Interface	500	(\$6.3)	(\$9.8)	(\$0.0)	\$3.4	(\$0.0)	\$0.1	\$0.0	(\$0.1)	\$3.3	726	42	
15	Aqueduct - Doubs	Line	AP	(\$5.6)	(\$8.7)	\$0.1	\$3.3	(\$0.1)	(\$0.0)	\$0.0	(\$0.1)	\$3.2	307	7	
17	Axton - Jacksons Ferry	Line	AEP	\$0.5	(\$2.3)	\$0.3	\$3.1	\$0.0	\$0.0	\$0.0	\$0.0	\$3.1	83	0	
18	Kanawha River	Transformer	AEP	\$1.7	(\$0.2)	\$0.5	\$2.4	\$0.2	(\$0.6)	(\$0.2)	\$0.5	\$2.9	113	36	
21	Cloverdale	Transformer	AEP	(\$0.1)	(\$2.4)	\$0.1	\$2.4	(\$0.2)	\$0.1	\$0.0	(\$0.2)	\$2.1	50	74	
28	Darwin - Eugene	Line	AEP	\$0.0	(\$0.3)	(\$0.0)	\$0.3	\$0.1	\$2.0	(\$0.0)	(\$1.9)	(\$1.5)	22	30	
32	Kammer - Natrium	Line	AEP	\$1.0	(\$0.2)	\$0.1	\$1.2	\$0.0	\$0.0	\$0.0	\$0.0	\$1.2	58	0	

AP Control Zone

Table 7-43 AP Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)									Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	AP South	Interface	500	(\$17.3)	(\$65.9)	(\$4.6)	\$44.0	\$2.6	\$2.6	\$3.3	\$3.4	\$47.4	3,501	604
2	Kammer	Transformer	500	\$17.8	\$27.8	\$6.8	(\$3.2)	(\$3.0)	(\$0.9)	(\$8.2)	(\$10.3)	(\$13.5)	3,674	1,328
3	Mount Storm - Pruntytown	Line	AP	(\$2.0)	(\$10.1)	(\$0.6)	\$7.4	\$0.8	\$0.8	\$0.5	\$0.5	\$7.9	525	132
4	Doubs	Transformer	AP	\$1.9	(\$6.6)	(\$0.2)	\$8.4	(\$0.2)	\$1.2	\$0.2	(\$1.1)	\$7.3	429	246
5	Bedington - Black Oak	Interface	500	(\$1.9)	(\$8.5)	(\$0.2)	\$6.3	(\$0.3)	\$0.2	\$0.4	(\$0.2)	\$6.2	645	73
6	5004/5005 Interface	Interface	500	(\$9.9)	(\$13.9)	(\$1.3)	\$2.7	\$1.0	\$0.9	\$1.8	\$1.9	\$4.6	776	294
7	Tiltonville - Windsor	Line	AP	\$7.5	\$2.3	\$0.5	\$5.7	(\$0.5)	(\$0.3)	(\$0.8)	(\$1.1)	\$4.6	1,449	311
8	Wylie Ridge	Transformer	AP	\$6.1	\$7.4	\$5.4	\$4.1	(\$1.1)	(\$0.5)	(\$7.2)	(\$7.7)	(\$3.6)	354	335
9	Belmont	Transformer	AP	\$3.5	\$0.2	\$0.6	\$4.0	(\$0.2)	\$0.5	(\$0.1)	(\$0.7)	\$3.2	1,029	76
10	Bedington - Harmony	Line	AP	\$2.1	(\$0.1)	\$0.5	\$2.8	\$0.0	\$0.0	(\$0.0)	(\$0.1)	\$2.7	280	28
11	Cloverdale - Lexington	Line	AEP	\$1.3	(\$1.5)	\$0.8	\$3.6	(\$0.1)	\$0.0	(\$0.9)	(\$1.0)	\$2.6	1,015	434
12	Carroll - Catoclin	Line	AP	\$0.4	\$0.0	(\$0.0)	\$0.3	\$0.7	(\$0.8)	\$0.2	\$1.6	\$2.0	99	22
13	Yukon	Transformer	AP	\$2.2	\$0.4	\$0.0	\$1.9	\$0.0	\$0.2	\$0.1	(\$0.1)	\$1.7	149	39
14	Krendale - Seneca	Line	AP	\$1.6	\$0.1	\$0.2	\$1.7	\$0.0	\$0.0	\$0.0	\$0.0	\$1.7	324	0
15	Tiltonville - Windsor	Line	AEP	\$1.6	\$0.3	\$0.0	\$1.4	\$0.0	\$0.0	\$0.0	\$0.0	\$1.4	592	0
17	Mount Storm	Transformer	AP	(\$0.5)	(\$2.2)	(\$0.3)	\$1.4	\$0.2	\$0.5	\$0.3	(\$0.1)	\$1.4	151	80
19	Samms - Wylie Ridge	Line	AP	\$3.9	\$2.9	\$1.6	\$2.6	(\$0.3)	(\$0.1)	(\$1.2)	(\$1.4)	\$1.2	762	157
21	Kingwood - Pruntytown	Line	AP	\$1.0	(\$0.1)	(\$0.0)	\$1.1	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$1.2	161	10
22	Middlebourne - Willow	Line	AP	\$1.3	\$0.1	(\$0.1)	\$1.1	(\$0.1)	(\$0.1)	(\$0.0)	\$0.0	\$1.1	348	45
23	Elrama - Mitchell	Line	AP	\$2.5	\$1.2	\$0.1	\$1.5	(\$0.2)	\$0.0	(\$0.2)	(\$0.4)	\$1.1	367	198

Table 7-44 AP Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)									Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	AP South	Interface	500	\$9.2	(\$141.1)	(\$0.3)	\$150.0	\$2.8	\$8.7	\$1.2	(\$4.6)	\$145.3	3,572	1,016
2	Mount Storm - Pruntytown	Line	AP	(\$8.2)	(\$94.1)	(\$0.4)	\$85.5	(\$0.3)	\$3.7	(\$0.1)	(\$4.1)	\$81.4	2,559	812
3	Bedington - Black Oak	Interface	500	(\$3.8)	(\$57.5)	(\$1.3)	\$52.5	\$0.7	\$0.3	\$0.8	\$1.2	\$53.7	1,384	284
4	Cloverdale - Lexington	Line	AEP	\$21.4	(\$27.6)	\$6.2	\$55.2	(\$3.1)	(\$0.5)	(\$7.8)	(\$10.5)	\$44.8	3,529	1,813
5	Bedington	Transformer	AP	\$32.9	(\$7.7)	\$1.3	\$41.9	(\$0.6)	(\$0.6)	(\$0.5)	(\$0.6)	\$41.4	1,192	303
6	Meadow Brook	Transformer	AP	\$28.4	(\$1.5)	\$0.6	\$30.5	(\$3.1)	(\$0.2)	(\$0.1)	(\$3.1)	\$27.4	774	173
7	Mount Storm	Transformer	AP	\$0.8	(\$28.2)	\$1.1	\$30.2	(\$2.0)	\$2.3	(\$0.9)	(\$5.2)	\$25.0	935	469
8	Samms - Wylie Ridge	Line	AP	\$11.5	\$7.8	\$5.7	\$9.4	(\$7.1)	\$1.0	(\$15.0)	(\$23.1)	(\$13.7)	1,915	1,257
9	Kammer	Transformer	500	\$26.7	\$39.9	\$7.1	(\$6.2)	(\$3.5)	(\$2.7)	(\$6.4)	(\$7.1)	(\$13.3)	3,069	1,628
10	Aqueduct - Doubs	Line	AP	(\$17.0)	(\$6.0)	(\$0.4)	(\$11.3)	\$0.1	\$0.1	\$0.0	\$0.0	(\$11.3)	307	7
11	Krendale - Seneca	Line	AP	\$7.8	(\$0.1)	\$2.2	\$10.1	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	\$10.0	1,389	24
12	West	Interface	500	(\$18.7)	(\$25.4)	(\$0.7)	\$6.0	\$2.0	\$1.0	\$0.7	\$1.7	\$7.7	1,690	390
13	Cedar Grove - Roseland	Line	PSEG	\$5.7	\$1.8	\$2.0	\$5.9	\$0.0	\$0.0	\$0.4	\$0.4	\$6.3	627	185
14	5004/5005 Interface	Interface	500	(\$6.9)	(\$12.0)	(\$0.4)	\$4.8	\$1.7	\$1.3	\$0.8	\$1.2	\$6.0	736	449
15	Kingwood - Pruntytown	Line	AP	\$5.2	(\$0.0)	\$0.1	\$5.3	\$0.0	\$0.0	(\$0.0)	\$0.0	\$5.3	360	13
17	Eureka - Willow Island	Line	AP	(\$0.3)	(\$4.7)	(\$0.1)	\$4.3	(\$0.2)	\$0.0	\$0.0	(\$0.2)	\$4.1	288	37
25	Middlebourne - Willow	Line	AP	\$0.5	(\$2.6)	\$0.0	\$3.2	(\$0.7)	\$0.0	(\$0.1)	(\$0.8)	\$2.4	122	51
26	Elrama - Mitchell	Line	AP	\$3.2	\$1.4	\$1.4	\$3.3	(\$0.1)	\$0.1	(\$1.0)	(\$1.1)	\$2.1	577	237
27	Black Oak	Transformer	AP	(\$2.9)	(\$4.8)	\$0.0	\$1.9	\$0.1	\$0.0	(\$0.0)	\$0.0	\$1.9	386	29
28	Yukon	Transformer	AP	\$1.9	\$0.1	\$0.1	\$1.9	(\$0.1)	\$0.2	\$0.0	(\$0.3)	\$1.6	98	44

ComEd Control Zone

Table 7-45 ComEd Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)								Event Hours		
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	Pleasant Valley - Belvidere	Line	ComEd	(\$4.7)	(\$42.8)	(\$0.0)	\$38.1	(\$0.2)	\$2.4	\$0.1	(\$2.5)	\$35.6	3,648	405
2	East Frankfort - Crete	Line	ComEd	(\$20.1)	(\$41.5)	(\$0.3)	\$21.1	\$0.0	\$0.0	\$0.0	\$0.0	\$21.1	2,134	0
3	Dunes Acres - Michigan City	Flowgate	Midwest ISO	(\$46.2)	(\$70.5)	(\$3.1)	\$21.3	(\$3.4)	(\$1.1)	\$0.9	(\$1.4)	\$19.8	2,949	910
4	Kammer	Transformer	500	(\$30.8)	(\$49.7)	(\$0.1)	\$18.7	(\$0.4)	(\$0.9)	(\$0.0)	\$0.4	\$19.1	3,674	1,328
5	AP South	Interface	500	(\$34.7)	(\$53.5)	(\$0.1)	\$18.7	(\$1.1)	(\$0.1)	(\$0.1)	(\$1.0)	\$17.6	3,501	604
6	Crete - St Johns Tap	Flowgate	Midwest ISO	(\$14.7)	(\$30.3)	(\$0.4)	\$15.2	(\$0.4)	\$0.1	\$0.1	(\$0.4)	\$14.8	1,565	306
7	Electric Jct - Nelson	Line	ComEd	\$0.2	(\$7.9)	\$0.1	\$8.2	\$2.1	\$1.4	(\$0.1)	\$0.6	\$8.8	823	202
8	5004/5005 Interface	Interface	500	(\$12.4)	(\$17.6)	(\$0.0)	\$5.1	(\$0.6)	(\$1.1)	(\$0.0)	\$0.4	\$5.6	776	294
9	Glidden - West Dekalb	Line	ComEd	(\$0.4)	(\$5.7)	\$0.1	\$5.4	\$0.1	(\$0.0)	\$0.0	\$0.2	\$5.6	1,166	21
10	Paddock - Townline	Flowgate	Midwest ISO	(\$0.8)	(\$5.0)	(\$0.1)	\$4.0	\$0.5	\$0.2	\$0.1	\$0.4	\$4.4	404	215
11	Sliver Lake - Cherry Valley	Line	ComEd	\$0.1	(\$3.7)	\$0.1	\$3.9	\$0.8	\$0.2	(\$0.1)	\$0.5	\$4.3	340	41
12	West	Interface	500	(\$12.4)	(\$16.6)	(\$0.0)	\$4.1	(\$0.1)	(\$0.1)	(\$0.0)	\$0.0	\$4.1	504	87
13	Wylie Ridge	Transformer	AP	(\$7.9)	(\$10.9)	(\$0.0)	\$3.0	(\$0.8)	(\$1.5)	\$0.0	\$0.8	\$3.8	354	335
14	Doubs	Transformer	AP	(\$7.5)	(\$11.8)	(\$0.0)	\$4.3	(\$0.7)	\$0.1	\$0.0	(\$0.7)	\$3.6	429	246
15	Cloverdale - Lexington	Line	AEP	(\$5.1)	(\$9.0)	(\$0.0)	\$3.9	(\$0.5)	(\$0.1)	\$0.0	(\$0.3)	\$3.5	1,015	434
19	Cherry Valley	Transformer	ComEd	\$0.4	(\$2.4)	\$0.0	\$2.8	\$0.0	\$0.0	\$0.0	(\$0.0)	\$2.8	25	6
23	Waterman - West Dekalb	Line	ComEd	(\$0.6)	(\$2.4)	\$0.0	\$1.9	\$0.3	(\$0.1)	(\$0.0)	\$0.3	\$2.2	1,499	57
24	Wilton Center - Pontiac Midpoint	Line	ComEd	\$1.6	\$0.4	\$0.0	\$1.3	\$0.1	\$0.7	\$0.0	(\$0.6)	\$0.7	205	55
29	Quad Cities - Cordova	Line	ComEd	\$0.2	(\$1.0)	\$0.0	\$1.3	(\$0.0)	\$0.1	\$0.0	(\$0.1)	\$1.2	115	15
30	Burnham - Munster	Line	ComEd	(\$2.1)	(\$3.4)	(\$0.0)	\$1.3	(\$0.0)	\$0.0	(\$0.0)	(\$0.1)	\$1.2	140	15

Table 7-46 ComEd Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)								Event Hours		
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	Cloverdale - Lexington	Line	AEP	(\$68.5)	(\$129.4)	\$0.6	\$61.5	(\$5.5)	(\$1.3)	(\$0.2)	(\$4.4)	\$57.2	3,529	1,813
2	AP South	Interface	500	(\$94.4)	(\$145.2)	\$1.1	\$51.9	(\$5.2)	(\$1.2)	(\$0.1)	(\$4.2)	\$47.7	3,572	1,016
3	Kammer	Transformer	500	(\$41.3)	(\$72.2)	(\$0.0)	\$30.8	(\$5.1)	\$2.9	(\$0.1)	(\$8.1)	\$22.7	3,069	1,628
4	East Frankfort - Crete	Line	ComEd	(\$14.4)	(\$32.9)	(\$0.1)	\$18.4	\$0.0	\$0.0	\$0.0	\$0.0	\$18.4	1,002	0
5	Mount Storm - Pruntytown	Line	AP	(\$45.5)	(\$70.9)	\$0.0	\$25.5	(\$6.5)	\$1.1	(\$0.2)	(\$7.9)	\$17.6	2,559	812
6	Bedington - Black Oak	Interface	500	(\$25.4)	(\$42.0)	\$0.2	\$16.8	(\$0.2)	(\$0.4)	\$0.0	\$0.2	\$17.0	1,384	284
7	West	Interface	500	(\$26.9)	(\$42.8)	\$0.1	\$16.0	(\$0.3)	(\$0.7)	(\$0.0)	\$0.4	\$16.4	1,690	390
8	Burnham - Munster	Line	ComEd	(\$23.6)	(\$38.2)	\$2.2	\$16.8	(\$2.6)	(\$2.6)	(\$0.5)	(\$0.5)	\$16.3	476	140
9	Dunes Acres - Michigan City	Flowgate	Midwest ISO	(\$9.5)	(\$17.3)	\$0.0	\$7.8	(\$2.1)	\$0.1	(\$0.2)	(\$2.4)	\$5.4	687	435
10	Krendale - Seneca	Line	AP	(\$6.1)	(\$11.0)	(\$0.0)	\$4.8	\$0.0	(\$0.0)	\$0.0	\$0.0	\$4.9	1,389	24
11	Crete - East Frankfurt	Line	ComEd	\$0.0	\$0.0	\$0.0	\$0.0	(\$5.0)	(\$1.1)	(\$0.7)	(\$4.6)	(\$4.6)	0	337
12	Central	Interface	500	(\$5.6)	(\$10.0)	(\$0.0)	\$4.4	(\$0.1)	(\$0.1)	(\$0.0)	(\$0.1)	\$4.3	726	42
13	Axton	Transformer	AEP	(\$7.2)	(\$11.4)	\$0.1	\$4.3	\$0.0	\$0.0	\$0.0	\$0.0	\$4.3	425	0
14	Dickerson - Pleasant View	Line	Peppo	(\$6.4)	(\$10.2)	\$0.0	\$3.8	(\$0.2)	(\$0.4)	\$0.0	\$0.2	\$4.0	844	218
15	5004/5005 Interface	Interface	500	(\$10.3)	(\$15.6)	(\$0.0)	\$5.3	(\$1.4)	(\$0.0)	(\$0.0)	(\$1.4)	\$3.9	736	449
19	Sliver Lake - Cherry Valley	Line	ComEd	\$0.1	(\$3.0)	\$0.0	\$3.1	\$0.0	\$0.0	\$0.0	\$0.0	\$3.1	99	0
20	Cherry Valley	Transformer	ComEd	\$2.1	(\$1.1)	\$0.0	\$3.3	\$0.3	\$0.5	(\$0.1)	(\$0.3)	\$3.0	92	128
22	Kincaid - Pana North	Line	ComEd	(\$1.3)	(\$3.8)	(\$0.0)	\$2.5	\$0.0	\$0.0	\$0.0	\$0.0	\$2.5	605	0
26	Dresden - Elwood	Line	ComEd	\$1.9	(\$1.5)	\$0.0	\$3.5	(\$0.2)	\$1.3	(\$0.0)	(\$1.5)	\$1.9	116	86
39	Wilton Center - Pontiac Midpoint	Line	ComEd	\$0.3	(\$0.0)	\$0.0	\$0.4	(\$0.2)	\$0.3	(\$0.0)	(\$0.5)	(\$0.1)	84	69

DAY Control Zone

Table 7-47 DAY Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)								Event Hours			
				Load Payments	Day Ahead			Total	Load Payments	Balancing		Total	Grand Total	Day Ahead	Real Time
					Generation Credits	Explicit	Generation Credits			Explicit					
1	Kammer	Transformer	500	(\$1.9)	(\$4.5)	(\$0.1)	\$2.6	\$0.4	(\$0.1)	\$0.0	\$0.5	\$3.1	3,674	1,328	
2	AP South	Interface	500	(\$2.6)	(\$3.9)	(\$0.0)	\$1.3	\$0.0	\$0.3	(\$0.0)	(\$0.3)	\$1.0	3,501	604	
3	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$0.4	\$1.0	(\$0.5)	(\$1.1)	(\$0.0)	(\$0.0)	\$0.1	\$0.2	(\$0.9)	2,949	910	
4	Doubs	Transformer	AP	(\$0.4)	(\$1.3)	\$0.0	\$0.9	\$0.0	\$0.1	\$0.0	(\$0.1)	\$0.8	429	246	
5	West	Interface	500	(\$0.9)	(\$1.5)	(\$0.0)	\$0.7	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.7	504	87	
6	Cloverdale - Lexington	Line	AEP	(\$0.3)	(\$0.9)	\$0.0	\$0.6	\$0.0	\$0.1	\$0.0	(\$0.1)	\$0.6	1,015	434	
7	Wylie Ridge	Transformer	AP	(\$0.6)	(\$1.1)	(\$0.0)	\$0.5	\$0.2	\$0.2	\$0.0	(\$0.0)	\$0.4	354	335	
8	5004/5005 Interface	Interface	500	(\$0.8)	(\$1.2)	(\$0.0)	\$0.4	\$0.1	\$0.1	\$0.0	(\$0.0)	\$0.4	776	294	
9	Tiltsville - Windsor	Line	AP	(\$0.3)	(\$0.7)	(\$0.0)	\$0.4	\$0.0	\$0.1	\$0.0	(\$0.1)	\$0.3	1,449	311	
10	East Frankfort - Crete	Line	ComEd	\$0.2	\$0.5	\$0.0	(\$0.3)	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.3)	2,134	0	
11	Marquis - Waverly	Line	AEP	\$0.0	(\$0.3)	(\$0.0)	\$0.3	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.2	74	14	
12	Elrama - Mitchell	Line	AP	(\$0.1)	(\$0.3)	(\$0.0)	\$0.2	\$0.1	\$0.0	\$0.0	\$0.1	\$0.2	367	198	
13	Sammis - Wylie Ridge	Line	AP	(\$0.3)	(\$0.5)	(\$0.0)	\$0.2	\$0.0	\$0.1	(\$0.0)	(\$0.0)	\$0.2	762	157	
14	AEP-DOM	Interface	500	(\$0.2)	(\$0.3)	\$0.0	\$0.2	\$0.0	(\$0.0)	\$0.0	\$0.0	\$0.2	325	136	
15	Pierce - Foster	Flowgate	Midwest ISO	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.1	(\$0.0)	(\$0.2)	(\$0.2)	0	5	

Table 7-48 DAY Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)								Event Hours			
				Load Payments	Day Ahead			Total	Load Payments	Balancing		Total	Grand Total	Day Ahead	Real Time
					Generation Credits	Explicit	Generation Credits			Explicit					
1	Cloverdale - Lexington	Line	AEP	(\$8.4)	(\$10.9)	\$0.1	\$2.5	\$0.3	(\$0.6)	\$0.0	\$1.0	\$3.5	3,529	1,813	
2	Kammer	Transformer	500	(\$5.0)	(\$6.4)	(\$0.0)	\$1.3	\$1.1	\$0.3	\$0.0	\$0.9	\$2.2	3,069	1,628	
3	AP South	Interface	500	(\$9.5)	(\$12.0)	(\$0.0)	\$2.5	\$0.4	\$0.8	(\$0.0)	(\$0.4)	\$2.1	3,572	1,016	
4	Bedington - Black Oak	Interface	500	(\$2.9)	(\$4.2)	(\$0.0)	\$1.3	\$0.1	\$0.3	(\$0.0)	(\$0.3)	\$1.0	1,384	284	
5	West	Interface	500	(\$2.5)	(\$3.9)	\$0.0	\$1.4	\$0.2	\$0.6	(\$0.0)	(\$0.5)	\$0.9	1,690	390	
6	Mount Storm - Pruntytown	Line	AP	(\$5.2)	(\$4.7)	\$0.0	(\$0.5)	\$0.1	\$0.4	(\$0.0)	(\$0.3)	(\$0.8)	2,559	812	
7	5004/5005 Interface	Interface	500	(\$0.9)	(\$1.6)	\$0.0	\$0.7	\$0.1	\$0.1	(\$0.0)	(\$0.0)	\$0.7	736	449	
8	Axton	Transformer	AEP	(\$0.7)	(\$1.1)	(\$0.0)	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	425	0	
9	Central	Interface	500	(\$0.6)	(\$1.0)	\$0.0	\$0.4	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.4	726	42	
10	Conemaugh - Keystone	Line	500	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.3	\$0.0	(\$0.0)	\$0.3	\$0.3	16	41	
11	Dickerson - Pleasant View	Line	Pepco	(\$0.6)	(\$0.9)	\$0.0	\$0.3	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.3	844	218	
12	Sammis - Wylie Ridge	Line	AP	(\$1.5)	(\$1.2)	(\$0.0)	(\$0.4)	\$0.8	(\$0.0)	(\$0.2)	\$0.6	\$0.2	1,915	1,257	
13	Mount Storm	Transformer	AP	(\$1.8)	(\$1.3)	\$0.0	(\$0.4)	(\$0.0)	(\$0.2)	(\$0.0)	\$0.1	(\$0.2)	935	469	
14	Axton - Jacksons Ferry	Line	AEP	(\$0.1)	(\$0.3)	(\$0.0)	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	83	0	
15	Whitpain	Transformer	PECO	(\$0.0)	(\$0.1)	\$0.0	\$0.1	\$0.0	(\$0.0)	(\$0.0)	\$0.1	\$0.2	89	68	
325	Miami Fort	Transformer	DAY	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.0	0	2	
467	Hutching - Carlisle	Line	DAY	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.0	0	1	

DLCO Control Zone

Table 7-49 DLCO Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)											Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours					
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Day Ahead	Real Time				
1	AP South	Interface	500	(\$15.3)	(\$21.2)	(\$0.1)	\$5.8	(\$0.8)	\$0.4	\$0.1	(\$1.1)	\$4.7	3,501	604			
2	Samms - Wylie Ridge	Line	AP	(\$5.2)	(\$10.0)	(\$0.0)	\$4.7	(\$0.2)	\$0.6	\$0.0	(\$0.7)	\$4.0	762	157			
3	Elrama - Mitchell	Line	AP	(\$3.1)	(\$2.0)	(\$0.0)	(\$1.1)	(\$0.2)	\$0.9	\$0.0	(\$1.1)	(\$2.2)	367	198			
4	West	Interface	500	(\$4.3)	(\$6.0)	(\$0.0)	\$1.8	(\$0.1)	\$0.9	\$0.0	(\$0.1)	\$1.6	504	87			
5	Logans Ferry - Universal	Line	DLCO	\$0.2	(\$1.3)	\$0.0	\$1.5	\$0.0	\$0.1	(\$0.0)	(\$0.1)	\$1.4	395	156			
6	Collier	Transformer	DLCO	\$1.4	\$0.3	\$0.0	\$1.2	\$0.0	\$0.0	\$0.0	\$0.0	\$1.2	46	0			
7	Wylie Ridge	Transformer	AP	(\$8.5)	(\$12.9)	(\$0.0)	\$4.4	(\$1.2)	\$2.2	\$0.0	(\$3.3)	\$1.1	354	335			
8	Kammer	Transformer	500	(\$3.6)	(\$4.8)	\$0.0	\$1.3	(\$0.4)	(\$0.1)	(\$0.0)	(\$0.4)	\$0.9	3,674	1,328			
9	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$1.7	\$2.6	(\$0.0)	(\$0.9)	\$0.2	\$0.1	(\$0.0)	\$0.1	(\$0.8)	2,949	910			
10	Krendale - Seneca	Line	AP	(\$1.7)	(\$2.3)	(\$0.0)	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	324	0			
11	Doubs	Transformer	AP	(\$1.9)	(\$1.4)	(\$0.0)	(\$0.5)	(\$0.1)	\$0.0	\$0.0	(\$0.2)	(\$0.7)	429	246			
12	Mount Storm - Pruntytown	Line	AP	(\$1.9)	(\$2.8)	(\$0.0)	\$0.9	(\$0.2)	\$0.1	\$0.0	(\$0.3)	\$0.6	525	132			
13	Kammer - West Bellaire	Line	AP	\$1.2	\$1.0	\$0.0	\$0.3	\$0.2	(\$0.1)	(\$0.0)	\$0.3	\$0.6	227	54			
14	Bedington - Black Oak	Interface	500	(\$1.8)	(\$2.4)	(\$0.0)	\$0.6	(\$0.0)	\$0.0	\$0.0	(\$0.1)	\$0.5	645	73			
15	5004/5005 Interface	Interface	500	(\$4.8)	(\$6.1)	(\$0.0)	\$1.3	(\$0.4)	\$0.5	\$0.0	(\$0.9)	\$0.4	776	294			
18	Collier - Elwyn	Line	DLCO	\$0.3	\$0.0	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	30	0			
20	Beaver - Clinton	Line	DLCO	\$0.1	(\$0.2)	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	20	0			
25	Cheswick - Logans Ferry	Line	DLCO	\$0.0	(\$0.1)	\$0.0	\$0.1	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.1	49	3			
26	Crescent	Transformer	DLCO	\$0.1	\$0.0	\$0.0	\$0.1	\$0.2	\$0.1	(\$0.0)	\$0.0	\$0.1	18	23			
29	Cheswick - Evergreen	Line	DLCO	\$0.0	(\$0.1)	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.1	35	5			

Table 7-50 DLCO Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)											Grand Total	Day Ahead	Real Time
				Day Ahead				Balancing				Event Hours					
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	Day Ahead	Real Time				
1	AP South	Interface	500	(\$37.3)	(\$53.7)	\$0.7	\$17.1	(\$7.7)	\$2.0	\$0.0	(\$9.7)	\$7.4	3,572	1,016			
2	Samms - Wylie Ridge	Line	AP	(\$15.5)	(\$33.8)	(\$0.1)	\$18.2	(\$16.9)	\$7.3	\$0.2	(\$24.0)	(\$5.8)	1,915	1,257			
3	Bedington - Black Oak	Interface	500	(\$13.3)	(\$19.0)	\$0.3	\$6.0	(\$1.2)	\$0.7	\$0.0	(\$1.9)	\$4.1	1,384	284			
4	Krendale - Seneca	Line	AP	(\$5.2)	(\$8.8)	(\$0.0)	\$3.7	(\$0.1)	\$0.0	\$0.0	(\$0.1)	\$3.6	1,389	24			
5	Cloverdale - Lexington	Line	AEP	(\$11.3)	(\$17.8)	\$0.2	\$6.7	(\$2.8)	\$1.0	(\$0.0)	(\$3.9)	\$2.8	3,529	1,813			
6	Cheswick - Universal	Line	DLCO	(\$1.3)	(\$3.7)	\$0.0	\$2.4	\$0.1	\$0.3	(\$0.0)	(\$0.2)	\$2.3	411	158			
7	Beaver - Clinton	Line	DLCO	\$0.8	(\$1.1)	\$0.0	\$1.9	\$0.0	\$0.0	\$0.0	\$0.0	\$1.9	184	0			
8	Mount Storm	Transformer	AP	(\$6.9)	(\$10.1)	(\$0.0)	\$3.2	(\$3.1)	\$1.7	\$0.0	(\$4.8)	(\$1.6)	935	469			
9	Central	Interface	500	(\$2.0)	(\$3.3)	(\$0.0)	\$1.3	(\$0.1)	\$0.0	\$0.0	(\$0.1)	\$1.2	726	42			
10	Cheswick - Evergreen	Line	DLCO	\$0.4	(\$1.3)	\$0.0	\$1.7	(\$0.2)	\$0.4	\$0.0	(\$0.5)	\$1.1	94	130			
11	Crescent	Transformer	DLCO	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	(\$0.3)	(\$0.0)	\$1.0	\$1.0	0	33			
12	East	Interface	500	(\$1.3)	(\$2.2)	\$0.0	\$0.9	(\$0.0)	\$0.0	\$0.0	(\$0.0)	\$0.9	758	12			
13	Mount Storm - Pruntytown	Line	AP	(\$21.6)	(\$31.3)	\$0.1	\$9.8	(\$5.6)	\$3.3	\$0.0	(\$9.0)	\$0.8	2,559	812			
14	Kammer	Transformer	500	(\$4.7)	(\$6.7)	\$0.0	\$2.0	(\$1.2)	\$0.0	(\$0.0)	(\$1.2)	\$0.8	3,069	1,628			
15	West	Interface	500	(\$10.2)	(\$13.5)	\$0.1	\$3.3	(\$1.6)	\$1.0	\$0.0	(\$2.5)	\$0.8	1,690	390			
18	Cheswick - Logans Ferry	Line	DLCO	\$0.7	(\$1.0)	\$0.0	\$1.7	(\$0.3)	\$0.7	(\$0.0)	(\$1.0)	\$0.8	166	155			
26	Brunot Island - Montour	Line	DLCO	\$0.5	\$0.0	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	(\$0.0)	\$0.5	12	6			
36	Beaver	Transformer	DLCO	\$0.2	(\$0.0)	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	10	0			
39	Arsenal - Oakland	Line	DLCO	\$0.2	(\$0.0)	\$0.0	\$0.2	(\$0.1)	(\$0.1)	(\$0.0)	\$0.0	\$0.2	44	50			
58	Collier	Transformer	DLCO	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	(\$0.0)	\$0.1	\$0.1	0	8			

Southern Region Congestion-Event Summaries

Dominion Control Zone

Table 7-51 Dominion Control Zone top congestion cost impacts (By facility): Calendar year 2009

No.	Constraint	Type	Location	Congestion Costs (Millions)									Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	AP South	Interface	500	\$37.3	(\$31.2)	(\$0.3)	\$68.2	\$1.6	\$1.2	\$0.4	\$0.8	\$69.0	3,501	604
2	Doubs	Transformer	AP	\$0.4	(\$5.5)	\$0.0	\$5.8	\$0.3	\$0.1	\$0.1	\$0.3	\$6.1	429	246
3	Cloverdale - Lexington	Line	AEP	\$7.0	\$2.7	\$1.1	\$5.4	(\$0.0)	(\$1.8)	(\$1.4)	\$0.4	\$5.8	1,015	434
4	Kammer	Transformer	500	\$10.3	\$8.3	\$2.1	\$4.2	(\$0.0)	(\$0.8)	(\$2.0)	(\$1.2)	\$3.0	3,674	1,328
5	Dunes Acres - Michigan City	Flowgate	Midwest ISO	\$4.4	\$2.1	\$0.1	\$2.4	(\$0.2)	(\$0.6)	(\$0.1)	\$0.3	\$2.7	2,949	910
6	Bedington - Black Oak	Interface	500	\$4.3	\$2.5	\$0.7	\$2.6	(\$0.1)	(\$0.1)	(\$0.2)	(\$0.1)	\$2.4	645	73
7	Beechwood - Kerr Dam	Line	Dominion	\$1.5	(\$0.8)	(\$0.1)	\$2.3	(\$0.2)	\$0.1	\$0.1	(\$0.2)	\$2.1	665	234
8	Bristers - Ox	Line	Dominion	(\$0.1)	(\$1.9)	\$0.0	\$1.8	\$0.1	\$0.4	\$0.0	(\$0.2)	\$1.6	62	42
9	Chuckatuck - Benns Church	Line	Dominion	\$1.5	(\$0.0)	\$0.0	\$1.6	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	45	0
10	AEP-DOM	Interface	500	\$1.7	\$1.1	\$0.1	\$0.7	(\$0.2)	(\$0.7)	(\$0.1)	\$0.3	\$1.1	325	136
11	East Frankfort - Crete	Line	ComEd	\$1.9	\$1.0	\$0.1	\$1.1	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	2,134	0
12	West	Interface	500	(\$2.6)	(\$3.6)	\$0.0	\$1.0	\$0.1	\$0.2	\$0.1	\$0.0	\$1.0	504	87
13	Wylie Ridge	Transformer	AP	\$2.5	\$1.7	\$0.4	\$1.2	(\$0.1)	(\$0.2)	(\$0.4)	(\$0.2)	\$1.0	354	335
14	Ox	Transformer	Dominion	\$0.8	(\$0.1)	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.0	8	0
15	Crete - St Johns Tap	Flowgate	Midwest ISO	\$1.6	\$0.8	\$0.2	\$0.9	(\$0.1)	(\$0.3)	(\$0.2)	\$0.0	\$0.9	1,565	306
17	Crozet - Dooms	Line	Dominion	\$0.7	(\$0.3)	\$0.0	\$1.0	(\$0.3)	(\$0.2)	(\$0.0)	(\$0.1)	\$0.9	55	37
20	Beaumeade - Ashburn	Line	Dominion	\$0.8	\$0.0	\$0.0	\$0.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.8	25	0
21	Chickahominy - Lanexa	Line	Dominion	\$0.5	(\$0.0)	\$0.0	\$0.6	(\$0.1)	(\$0.3)	\$0.0	\$0.1	\$0.7	42	19
22	Clover - Farmville	Line	Dominion	(\$0.0)	(\$0.7)	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	41	0
23	Crozet - Barracks Rd	Line	Dominion	\$0.8	\$0.3	(\$0.0)	\$0.4	\$0.1	(\$0.1)	\$0.0	\$0.2	\$0.6	39	11

Table 7-52 Dominion Control Zone top congestion cost impacts (By facility): Calendar year 2008

No.	Constraint	Type	Location	Congestion Costs (Millions)									Event Hours	
				Day Ahead				Balancing				Grand Total	Day Ahead	Real Time
				Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
1	AP South	Interface	500	\$82.8	(\$94.7)	\$4.6	\$182.2	\$6.3	\$7.8	(\$3.6)	(\$5.1)	\$177.1	3,572	1,016
2	Cloverdale - Lexington	Line	AEP	\$111.7	\$45.7	\$11.5	\$77.5	(\$0.4)	(\$8.5)	(\$10.3)	(\$2.1)	\$75.3	3,529	1,813
3	Bedington - Black Oak	Interface	500	\$34.0	\$18.4	\$1.9	\$17.5	\$0.3	(\$1.0)	(\$0.8)	\$0.6	\$18.1	1,384	284
4	Mount Storm	Transformer	AP	\$21.4	\$8.6	\$3.9	\$16.7	(\$8.8)	\$16.4	(\$4.4)	(\$29.6)	(\$12.9)	935	469
5	Aqueduct - Doubs	Line	AP	\$9.3	(\$2.8)	\$0.2	\$12.3	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$12.3	307	7
6	Bristers - Ox	Line	Dominion	(\$1.2)	(\$12.4)	(\$0.6)	\$10.7	\$0.8	\$1.1	\$0.4	\$0.1	\$10.8	77	38
7	Dickerson - Pleasant View	Line	Pepco	(\$12.6)	(\$4.6)	(\$0.3)	(\$8.2)	(\$0.2)	\$0.9	\$0.3	(\$0.7)	(\$8.9)	844	218
8	Mount Storm - Pruntytown	Line	AP	\$60.1	\$62.2	\$6.9	\$4.8	(\$4.3)	(\$14.8)	(\$6.7)	\$3.9	\$8.7	2,559	812
9	Meadow Brook	Transformer	AP	(\$0.7)	(\$6.8)	(\$0.1)	\$6.1	(\$0.1)	\$0.3	\$0.1	(\$0.3)	\$5.8	774	173
10	Kammer	Transformer	500	\$16.7	\$14.0	\$1.8	\$4.5	(\$0.1)	(\$3.2)	(\$1.9)	\$1.1	\$5.6	3,069	1,628
11	Danville - East Danville	Line	Dominion	\$4.9	\$2.0	\$0.2	\$3.1	(\$0.2)	(\$0.2)	\$0.3	\$0.3	\$3.4	692	152
12	East	Interface	500	(\$5.6)	(\$2.7)	(\$0.4)	(\$3.3)	\$0.0	\$0.0	\$0.0	(\$0.0)	(\$3.3)	758	12
13	Brighton	Transformer	Pepco	\$3.8	\$1.0	\$0.2	\$3.1	(\$0.2)	(\$0.8)	(\$0.5)	\$0.2	\$3.3	116	78
14	Pleasantville - Ashburn	Line	Dominion	\$3.2	\$0.2	\$0.0	\$3.1	\$0.0	\$0.0	\$0.0	\$0.0	\$3.1	10	0
15	Sammis - Wylie Ridge	Line	AP	\$4.5	\$2.2	\$1.0	\$3.3	(\$0.3)	(\$1.8)	(\$1.8)	(\$0.3)	\$3.0	1,915	1,257
19	Beechwood - Kerr Dam	Line	Dominion	\$1.6	(\$1.0)	\$0.3	\$3.0	(\$0.1)	\$0.3	(\$0.2)	(\$0.6)	\$2.3	318	168
22	Harrisonburg - Endless Caverns	Line	Dominion	\$1.3	(\$0.6)	(\$0.0)	\$1.9	\$0.0	\$0.0	\$0.0	\$0.0	\$1.9	83	0
26	Halifax - Halifax	Line	Dominion	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	(\$0.5)	(\$1.8)	(\$1.2)	(\$1.2)	0	63
29	Cradock - Chesapeake	Line	Dominion	\$0.5	(\$0.5)	\$0.0	\$1.1	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$1.0	79	3
30	Sideburn - Ravensworth	Line	Dominion	(\$0.1)	(\$1.2)	(\$0.0)	\$1.0	\$0.0	\$0.0	\$0.0	(\$0.0)	\$1.0	10	3

Economic Planning Process

Transmission system investments can be evaluated on a reliability basis or on an economic basis. The reliability evaluation examines whether a transmission upgrade is required in order to maintain reliability on the system in a particular area or areas, using specific planning and reliability criteria.²¹ The economic evaluation examines whether a transmission upgrade, including reliability upgrades, results in positive economic benefits. The economic evaluation is more complex than a reliability evaluation because there is more judgment involved in the choice of relevant metrics for both benefits and costs. PJM's responsibility as an RTO requires PJM to constantly evaluate the need for transmission investments related to reliability and to help ensure that the responsible transmission owner constructs needed facilities. As the operator and designer of markets, PJM also needs to consider the appropriate role for the economic evaluation of transmission system investments.

Investments in transmission are currently compensated under the FERC's traditional cost of service regulatory approach. Although PJM's Tariff permits merchant projects, the significant merchant transmission projects have been direct current (DC) tie lines to export power rather than investments in network facilities. As a general matter, transmission investments have not been fully incorporated into competitive markets. The construction of new transmission facilities can have significant impacts on energy and capacity markets, but there is no market mechanism in place that would require competition between transmission and generation to meet loads in an area. While the RPM construct does provide that qualifying transmission upgrades may be submitted as offers, there have been no such offers. More generally, network transmission is not built based directly on market signals because the owners of network transmission are compensated through a non-market mechanism. Although the PJM Tariff does not yet comprehensively address the issue of competition between transmission and generation projects to solve congestion problems, PJM has taken a first step towards integrating transmission investments into the market through the use of economic evaluation metrics. Economic evaluation metrics can be used to determine whether there are positive economic benefits associated with an investment in transmission that might warrant the investment even when it is not required for reliability.

After multiple filings in a proceeding concerning PJM's proposed economic metrics for evaluating transmission investments (Docket No. ER06-1474), the United States Federal Energy Regulatory Commission (FERC) approved in early 2009 an approach with predefined formulas for determining whether a transmission investment passes the cost-benefit test including explicit accounting for changes in production costs, the costs of complying with environmental regulations, generation availability trends and demand-response trends.²²

On September 8, 2006, PJM filed to modify its Regional Transmission Expansion Plan ("RTEP") protocol.²³ PJM proposed to replace its economic planning process with processes that would evaluate the economic benefits of accelerating or modifying planned reliability-based upgrades or of constructing new enhancements or expansions to relieve costly congestion. In its initial order, the FERC conditionally accepted PJM's proposed changes to the economic transmission planning process component of the RTEP, including the requisite amendments to Schedule 6 of the OA

²¹ See PJM OA Schedule 6.

²² 126 FERC ¶ 61,152.

²³ PJM Initial Filing, Docket No. ER06-1474-000.

and the PJM OATT. The Commission also directed PJM to make a compliance filing that would: (i) explain how PJM considers and weighs the various metrics used to evaluate whether to recommend including an upgrade in the RTEP for economic reasons; (ii) clarify the role of demand response, generation and merchant transmission in the process; and (iii) provide additional information regarding the advanced technologies currently assessed.²⁴

On March 21, 2007, PJM submitted its first compliance filing, providing further explanation of its metrics.²⁵ By order issued June 11, 2007, the Commission determined that PJM's proposal was still inadequate and directed PJM to file a formulaic approach to choosing economic projects proposed to reduce congestion that describes exactly how any metrics will be calculated, weighed, considered and combined.²⁶

On October 9, 2007, PJM submitted its second compliance filing to address these issues, proposing a formulaic approach modeled on one developed by the Midwest ISO.²⁷ By order issued April 17, 2008, the FERC largely accepted PJM's proposed formulaic approach, but it required that PJM revise its proposal to (i) calculate load payments net of the change in the value of transmission rights, (ii) include more specific descriptions of the method of determining the discount rate and recovery period, and (iii) either reinstate provisions for sensitivity analyses or explain why such analyses are unnecessary.²⁸

PJM's third compliance filing, submitted June 16, 2008,²⁹ addressed each of the three issues identified by the Commission in its 2006 order. In addressing the third item, PJM filed a new approach to perform sensitivity analyses. The new approach provides that PJM will perform a sensitivity analysis for projects included in the RTEP on the basis of certain objective criteria, including, but not limited to, the discount rate used to determine the present value of the Total Annual Enhancement Benefit and Total Enhancement Cost, and the annual revenue requirement, including the recovery period, used to determine the Total Enhancement Cost. Such analyses will consider key inputs used in market simulations performed by PJM (such as price forecasts and expected levels of demand response) in order to determine a "Benefit/Cost Ratio." PJM proposed to provide these results to the Transmission Expansion Advisory Committee (TEAC) in order to assist its evaluation. On February 20, 2009, the FERC issued an order accepting PJM's third compliance filing and denying requests for rehearing of its second order on compliance.³⁰

The economic planning process creates market based signals for transmission investment and incorporates improvements over the prior process. The most significant improvements are the inclusion of less discretionary metrics and the evaluation of demand side response and generation resources as alternatives to transmission investment. New transmission projects, and the limits of the existing transmission system, can and do have significant impacts on PJM energy and capacity markets.

The goal of transmission planning in the PJM market design should ultimately be the incorporation of transmission investment decisions into market driven processes as much as possible.

²⁴ 117 FERC ¶ 61,218 (2006).

²⁵ PJM submitted its first compliance filing in Subdocket No. ER06-1474-003.

²⁶ 119 FERC ¶ 61,265.

²⁷ PJM submitted its second compliance filing in Subdocket No. ER06-1474-004.

²⁸ 123 FERC ¶ 61,051.

²⁹ PJM submitted its third compliance filing in Subdocket No. ER06-1474-006.

³⁰ 126 FERC ¶ 61,152.

