

REPORT TO THE NORTH CAROLINA STATE CORPORATION COMMISSION: Congestion in the Dominion Service Territory in North Carolina

Overview of Congestion Calculations

This report provides details of congestion associated with Dominion's (DOM) service territory within the state of North Carolina for the periods of May 1, 2005, to April 30, 2006 (2005/2006), and May 1, 2006, to April 30, 2007 (2006/2007), and May 1, 2007, to April 30, 2008 (2007/2008). Congestion calculations are for the entire territory and not for any specific organization; the total congestion calculations are the sum of all the congestion calculations for the organizations with market activity in the area. The report also includes congestion event hours for the constraints which had the largest impact on congestion charges in DOM, either positive or negative, and the congestion charges associated with each constraint.¹

Total congestion costs equal load congestion payments minus generation congestion credits plus explicit congestion costs. Net congestion costs equal load congestion payments minus generation congestion credits.² Explicit congestion is the net congestion cost associated with point-to-point energy transactions. Each of these categories of congestion costs are comprised of day-ahead and balancing congestion costs. Day-ahead congestion is based on day-ahead MW while balancing congestion is based on deviations between day-ahead and real-time MW.³

Table 1 shows a summary of the congestion costs associated with the North Carolina portion of the DOM service territory since its integration in May 2005. In addition, Table 2 shows a monthly breakdown of congestion costs.

¹ Congestion event hours are hours in which a transmission constraint is binding. In day ahead, an interval equals one hour. In real time, an interval equals five minutes. In order to have a consistent metric for day-ahead and real-time congestion frequency, real-time congestion frequency is measured using the convention that an hour is constrained if any one of its component five-minute intervals is constrained.

² Prior to June 1, 2007, PJM Congestion Accounting methods included Implicit Congestion Costs, Spot Congestion Costs, and Explicit Congestion Costs. After June 1, 2007, PJM no longer calculates spot congestion costs. Implicit congestion costs are now equal to the difference between load congestion payments and generation congestion credits. Explicit congestion costs remained the same after June 1, 2007.

³ See Table 16, "Congestion Definitions," for a summary of relevant definitions.

Table 1 Total Dominion North Carolina congestion costs (Dollars (Millions)): May 1, 2005 to April 30, 2008.

	Congestion Costs	Percent Change
2005/2006	\$30.4	NA
2006/2007	\$24.9	-18%
2007/2008	\$22.4	-10%
Total	\$77.6	

Table 2 Monthly Dominion North Carolina congestion costs (Dollars (Millions)): May 1, 2005 to April 30, 2008.

	Total Congestion Costs			
	2005	2006	2007	2008
Jan		\$2.7	\$1.5	\$3.1
Feb		(\$0.8)	\$2.0	\$1.1
Mar		\$0.2	\$2.2	\$0.2
Apr		\$1.2	\$1.2	\$0.5
May	\$1.3	\$0.5	\$1.7	
Jun	\$3.3	\$2.3	\$2.1	
Jul	\$5.0	\$3.8	\$2.9	
Aug	\$6.1	\$6.7	\$2.7	
Sept	\$4.6	\$0.9	\$1.7	
Oct	\$3.7	\$0.1	\$1.8	
Nov	\$1.6	\$0.7	\$2.1	
Dec	\$1.4	\$2.8	\$2.5	

Congestion charges can be both positive and negative. When a constraint binds, the price effects of that constraint vary. The system marginal price (SMP) is uniform for all areas, while the congestion components of LMP will either be positive or negative in a specific area, meaning that actual LMPs are above or below the SMP.⁴ Usually a smaller area affected by a constraint will have increased prices and the larger unconstrained system will have lower prices. If an area is located upstream from the constrained element, the area will experience negative congestion costs (lower prices) from that constrained element. Conversely, positive congestion costs occur when an area is located downstream from a constrained element. Balancing congestion result from load or generation deviations between Day-Ahead and Real-Time markets. If a participant has

⁴ The SMP is the price of the distributed load reference bus. The price at the reference bus is equivalent to the five minute real-time or hourly day-ahead load weighted PJM LMP.

real-time generation or load that is less than its day-ahead generation or load then the deviation will be negative. If there is a negative load deviation at a bus where real-time LMP has a positive congestion component, negative balancing congestion costs will result. Similarly, if there is a positive load deviation at a bus where real-time LMP has a negative congestion component, negative balancing congestion costs will result.

Table 1 and Table 2 provide a summary of the total congestion charges in the North Carolina portion of Dominion.

In order to provide a more detailed explanation of the congestion calculations from which the total congestion charges are derived, each category of congestion is defined and a table of the congestion charges or credits associated with each category is provided.

Net Congestion Bill

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.

Load congestion payments are netted against generation congestion credits on an hourly basis, by participant, and then summed for the given period. A participant 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 sale transactions. (Decrement bids and energy sales can be thought of as scheduled load.) Day-ahead load congestion payments are calculated using load MW and the congestion component of LMP (CLMP) for the load bus, decrement bid location, or 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 purchase transactions. (Increment offers and energy purchases can

be thought of as scheduled generation.) Day-Ahead generation congestion credits are calculated using generation MW and the CLMP for the generator bus, increment offer location, or 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 from a member's day-ahead scheduled load 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 from a member's day-ahead scheduled generation exists.

Explicit Congestion Costs

Explicit Congestion costs are the congestion costs associated with moving energy from one specific point to another across the transmission system. Point-to-point transactions may be either internal to PJM or be import or export transactions. Explicit Congestion charges equal the difference between source and sink CLMPs for a point-to-point transaction.

- **Internal Purchases** – For internal purchases the Explicit Congestion costs are calculated based on the difference in CLMPs between the sink bus and source bus of the purchase.
- **Import & Export Transactions** – For point-to-point and network secondary transmission customers, the Explicit Congestion costs are calculated based on the difference between source and sink CLMP, specific to each constraint.

The Explicit Congestion Costs calculated for the North Carolina portion of Dominion represent the costs associated with point to point transactions that sink in the North Carolina portion of Dominion. For example, if a transaction is sourced in Pennsylvania and sinks in Dominion North Carolina, the charges would be based on the MW of the transaction multiplied by the difference between the sink CLMP and the source CLMP. The resulting congestion costs are allocated to the zone and state of the sink location, in this case Dominion North Carolina.

Table 3 shows the combined day-ahead and balancing load congestion payments, generation congestion credits, and explicit congestion costs for the Dominion North

Carolina service territory for May 1, 2005 to April 30, 2008. Table 4 shows the congestion costs categories separated by day-ahead and balancing to show the contributions from both the day-ahead and real-time markets.

Table 3 Total Dominion North Carolina congestion costs by category: May 1, 2005 to April 30, 2008.

Congestion Costs (Millions)					
	Load Payments	Generation Credits	Net Congestion Bill		Grand Total
				Explicit	
2005/2006	\$41.3	\$20.7	\$20.6	\$9.8	\$30.4
2006/2007	\$42.2	\$22.6	\$19.7	\$5.2	\$24.9
2007/2008	\$24.6	\$6.6	\$18.1	\$4.3	\$22.4

Table 4 Total day-ahead and balancing Dominion North Carolina congestion costs by category: May 1, 2005 to April 30, 2008.

Congestion Costs (Millions)									
	Day Ahead				Balancing				Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	
2005/2006	\$45.3	\$16.7	\$7.5	\$36.1	(\$4.1)	\$3.9	\$2.3	(\$5.7)	\$30.4
2006/2007	\$46.2	\$19.0	\$3.6	\$30.8	(\$4.0)	\$3.6	\$1.6	(\$5.9)	\$24.9
2007/2008	\$29.8	\$6.9	\$4.5	\$27.4	(\$5.2)	(\$0.4)	(\$0.2)	(\$5.0)	\$22.4

Table 5 lists the top 15 constraints affecting Dominion North Carolina congestion costs for the period beginning May 1, 2005 and ending April 30, 2006.⁵ Table 5 provides the type of constraint (Line, Transformer, or Interface), the location of the constraint and the congestion event hours for the period analyzed. Table 5, Table 7, and Table 10 illustrate that constraints outside of the Dominion control zone, such as Branchburg – Readington line in PSEG or the Kanawaha – Matt Funk line in AEP, can impact the Dominion congestion costs.

⁵ The top 15 constraints are determined based on the absolute value of total congestion costs for the period.

Table 5 Top 15 constraints affecting Dominion North Carolina congestion costs: May 1, 2005 to April 30, 2006.

No.	Constraint	Type	Location	Event Hours	
				Day Ahead	Real Time
1	Bedington - Black Oak	Interface	500	4,934	2,045
2	Kammer	Transformer	500	4,316	1,900
3	Kanawha - Matt Funk	Line	AEP	1,559	909
4	Doubs - Mount Storm	Line	500	548	567
5	Branchburg - Readington	Line	PSEG	745	330
6	Central	Interface	500	890	21
7	Beck - Middleport	Flowgate	Midwest ISO	0	61
8	Homer City - Watercure	Line	PENELEC	870	30
9	AP South	Interface	500	697	155
10	Wylie Ridge	Transformer	AP	2,267	1,779
11	Branchburg	Transformer	PSEG	421	269
12	West	Interface	500	1,289	310
13	Beechwood - Kerr Dam	Line	Dominion	233	204
14	Mount Storm - Pruntytown	Line	AP	379	986
15	East	Interface	500	655	16

Table 6 shows the congestion cost details of the top 15 constraints affecting Dominion North Carolina for the period beginning May 1, 2005 and ending April 30, 2006. The Bedington - Black Oak interface had the largest impact on congestion costs with a total of \$16.8 million or 55 percent of total congestion costs. The Kammer transformer was the second largest contributor to congestion costs in Dominion North Carolina during the 2005/2006 period with \$5.8 million.

Table 6 Congestion cost details for the top 15 constraints affecting Dominion North Carolina: May 1, 2005 to April 30, 2006.

Constraint	Congestion Costs (Millions)									
	Day Ahead				Balancing				Grand Total	
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total		
Bedington - Black Oak	\$38.8	\$17.9	\$2.6	\$23.6	(\$2.7)	\$5.2	\$1.1	(\$6.9)	\$16.8	
Kammer	\$5.6	\$1.4	\$1.3	\$5.6	(\$0.7)	\$0.0	\$0.9	\$0.2	\$5.8	
Kanawha - Matt Funk	\$8.0	\$6.5	\$0.9	\$2.4	(\$0.3)	\$4.6	(\$0.4)	(\$5.3)	(\$2.9)	
Doubs - Mount Storm	\$2.4	\$0.9	\$0.2	\$1.7	(\$0.3)	\$0.1	\$0.2	(\$0.3)	\$1.5	
Branchburg - Readington	(\$1.2)	(\$0.9)	(\$0.0)	(\$0.3)	\$0.4	(\$1.4)	(\$0.0)	\$1.7	\$1.4	
Central	(\$2.8)	(\$1.5)	(\$0.0)	(\$1.3)	\$0.0	(\$0.1)	\$0.0	\$0.1	(\$1.2)	
Beck - Middleport	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	(\$0.7)	\$0.0	\$1.1	\$1.1	
Homer City - Watercure	(\$1.9)	(\$0.9)	\$0.0	(\$1.1)	(\$0.0)	(\$0.0)	\$0.0	\$0.0	(\$1.0)	
AP South	\$1.9	\$0.8	\$0.1	\$1.3	(\$0.1)	\$0.2	\$0.1	(\$0.2)	\$1.0	
Wylie Ridge	\$0.7	\$0.1	\$0.4	\$1.1	(\$0.3)	(\$0.1)	\$0.2	(\$0.0)	\$1.0	
Branchburg	(\$0.4)	(\$0.3)	\$0.0	(\$0.1)	\$0.2	(\$0.7)	(\$0.1)	\$0.9	\$0.8	
West	(\$2.2)	(\$2.1)	\$0.1	\$0.0	\$0.2	(\$0.6)	\$0.0	\$0.8	\$0.8	
Beechwood - Kerr Dam	\$1.2	\$0.5	(\$0.0)	\$0.8	(\$0.2)	(\$0.2)	(\$0.0)	(\$0.0)	\$0.8	
Mount Storm - Pruntytown	\$3.6	\$1.2	\$0.4	\$2.8	(\$1.1)	\$1.5	\$0.5	(\$2.1)	\$0.7	
East	(\$1.4)	(\$0.8)	(\$0.0)	(\$0.7)	\$0.0	(\$0.0)	\$0.0	\$0.1	(\$0.6)	

Table 7 lists the top 15 constraints affecting Dominion North Carolina congestion costs for the period beginning May 1, 2006 and ending April 30, 2007. Table 7 provides the type of constraint (Line, Transformer, or Interface), the location of the constraint and the congestion event hours for the period analyzed.

Table 7 Top 15 constraints affecting Dominion North Carolina congestion costs: May 1, 2006 to April 30, 2007.

No.	Constraint	Type	Location	Event Hours	
				Day Ahead	Real Time
1	Bedington - Black Oak	Interface	500	4,527	1,679
2	Mount Storm - Pruntytown	Line	AP	909	478
3	Cloverdale - Lexington	Line	AEP	2,674	1,542
4	Cedar Grove - Roseland	Line	PSEG	2,800	486
5	Kanawha - Matt Funk	Line	AEP	790	234
6	Danville - East Danville	Line	Dominion	688	27
7	Branchburg - Readington	Line	PSEG	1,614	774
8	Central	Interface	500	1,265	18
9	Meadow Brook	Transformer	AP	920	194
10	Axton	Transformer	AEP	231	35
11	Axton - Jacksons Ferry	Line	AEP	381	10
12	Muskingum River - Ohio Ce	Line	AEP	12	25
13	Kammer	Transformer	500	1,275	455
14	Brighton	Transformer	Pepco	3	79
15	Beechwood - Kerr Dam	Line	Dominion	380	282

Table 8 shows the congestion cost details of the top 15 constraints affecting Dominion North Carolina for the period beginning May 1, 2006 and ending April 30, 2007. The Bedington - Black Oak interface had the largest impact on congestion costs with a total of \$14.2 million or 57 percent of total congestion costs.

Table 8 Congestion cost details for the top 15 constraints affecting Dominion North Carolina: May 1, 2006 to April 30, 2007.

Constraint	Congestion Costs (Millions)										
	Day Ahead					Balancing					Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
Bedington - Black Oak	\$28.8	\$12.5	\$1.3	\$17.6	(\$2.2)	\$2.4	\$1.2	(\$3.4)	\$14.2		
Mount Storm - Pruntytown	\$8.1	\$3.8	\$0.5	\$4.8	\$0.1	\$0.8	\$0.3	(\$0.3)	\$4.5		
Cloverdale - Lexington	\$6.5	\$2.4	\$1.3	\$5.3	(\$1.4)	\$0.1	\$0.0	(\$1.5)	\$3.8		
Cedar Grove - Roseland	(\$3.7)	(\$1.8)	\$0.0	(\$1.9)	(\$0.1)	(\$0.3)	(\$0.1)	\$0.2	(\$1.7)		
Kanawha - Matt Funk	\$2.4	\$1.4	\$0.1	\$1.2	\$0.4	\$0.1	\$0.2	\$0.5	\$1.7		
Danville - East Danville	\$2.1	\$0.7	\$0.2	\$1.5	\$0.1	\$0.1	(\$0.0)	\$0.0	\$1.5		
Branchburg - Readington	(\$4.0)	(\$1.8)	\$0.0	(\$2.2)	\$0.5	(\$0.2)	(\$0.0)	\$0.7	(\$1.5)		
Central	(\$2.8)	(\$1.5)	(\$0.0)	(\$1.4)	\$0.0	(\$0.0)	\$0.0	\$0.0	(\$1.4)		
Meadow Brook	(\$1.6)	(\$0.8)	(\$0.6)	(\$1.4)	\$0.0	(\$0.0)	\$0.1	\$0.1	(\$1.3)		
Axton	\$3.4	\$2.0	(\$0.0)	\$1.4	(\$0.0)	\$0.2	\$0.0	(\$0.2)	\$1.2		
Axton - Jacksons Ferry	\$1.6	\$0.8	\$0.1	\$0.8	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.8		
Muskingum River - Ohio Ce	(\$0.0)	(\$0.0)	\$0.0	(\$0.0)	\$0.2	(\$0.4)	\$0.0	\$0.7	\$0.7		
Kammer	\$0.8	\$0.3	\$0.1	\$0.6	(\$0.1)	(\$0.0)	\$0.1	(\$0.0)	\$0.6		
Brighton	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.1)	\$0.5	(\$0.0)	(\$0.6)	(\$0.6)		
Beechwood - Kerr Dam	\$1.9	\$1.0	\$0.0	\$1.0	(\$0.5)	(\$0.1)	\$0.0	(\$0.4)	\$0.6		

Table 9 shows the largest deltas by constraint for the period ending April 30, 2007 compared to the period ending April 30, 2006. The Kammer transformer experienced the largest decrease in congestion costs of \$5.1 million. This decrease was offset by increased congestion costs from the Kanawah – Matt Funk line, the Mount Storm – Pruntytown line and the Cloverdale – Lexington line. The net increase in congestion costs for these four constraints was \$6.5 million. However, across all constraints affecting the Dominion service territory of North Carolina, there was a net decrease in congestion costs from 2005/2006 period to the 2006/2007 period of approximately \$5.5 million or 18 percent.

Table 9 Top 15 constraint congestion cost deltas from the prior period: May 1, 2006 to April 30, 2007 minus May 1, 2005 to April 30, 2006.

Constraint	Congestion Cost Deltas (Millions)										
	Day Ahead					Balancing					Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
Kammer	(\$4.8)	(\$1.1)	(\$1.2)	(\$4.9)	\$0.5	(\$0.1)	(\$0.8)	(\$0.2)	(\$5.1)		
Kanawha - Matt Funk	(\$5.6)	(\$5.1)	(\$0.8)	(\$1.2)	\$0.6	(\$4.5)	\$0.6	\$5.8	\$4.5		
Mount Storm - Pruntytown	\$4.5	\$2.6	\$0.1	\$2.0	\$1.3	(\$0.7)	(\$0.2)	\$1.8	\$3.7		
Cloverdale - Lexington	\$5.7	\$2.3	\$1.1	\$4.6	(\$1.1)	\$0.3	\$0.1	(\$1.2)	\$3.4		
Branchburg - Readington	(\$2.8)	(\$1.0)	\$0.0	(\$1.8)	\$0.2	\$1.2	(\$0.0)	(\$1.0)	(\$2.9)		
Bedington - Black Oak	(\$10.0)	(\$5.4)	(\$1.3)	(\$6.0)	\$0.5	(\$2.8)	\$0.2	\$3.5	(\$2.5)		
Danville - East Danville	\$2.0	\$0.7	\$0.1	\$1.4	\$0.1	\$0.1	(\$0.0)	\$0.0	\$1.4		
Cedar Grove - Roseland	(\$0.6)	\$0.4	\$0.0	(\$1.0)	(\$0.1)	\$0.4	(\$0.0)	(\$0.5)	(\$1.4)		
Doubs - Mount Storm	(\$2.0)	(\$0.8)	(\$0.4)	(\$1.5)	\$0.3	(\$0.1)	(\$0.2)	\$0.2	(\$1.3)		
Axton	\$3.4	\$2.0	(\$0.0)	\$1.4	(\$0.0)	\$0.2	\$0.0	(\$0.2)	\$1.2		
Beck - Middleport	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.4)	\$0.7	(\$0.0)	(\$1.1)	(\$1.1)		
Homer City - Watercure	\$1.9	\$0.9	(\$0.0)	\$1.1	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$1.0		
Meadow Brook	(\$1.4)	(\$0.7)	(\$0.6)	(\$1.3)	\$0.0	(\$0.1)	\$0.2	\$0.3	(\$1.0)		
West	\$1.3	\$1.7	(\$0.0)	(\$0.5)	\$0.0	\$0.5	\$0.0	(\$0.5)	(\$1.0)		
5004/5005 Interface	\$0.7	\$0.7	(\$0.2)	(\$0.2)	(\$0.1)	\$0.6	(\$0.0)	(\$0.7)	(\$0.9)		

Table 10 lists the top 15 constraint affecting Dominion North Carolina congestion costs for the period beginning May 1, 2007 and ending April 30, 2008. Table 10 provides the type of constraint (Line, Transformer, or Interface), the location of the constraint and the congestion event hours for the period analyzed.

Table 10 Top 15 constraints affecting Dominion North Carolina congestion costs: May 1, 2007 to April 30, 2008.

No.	Constraint	Type	Location	Event Hours	
				Day Ahead	Real Time
1	Bedington - Black Oak	Interface	500	3,751	1,335
2	Cloverdale - Lexington	Line	AEP	3,554	1,666
3	AP South	Interface	500	1,204	461
4	Kammer	Transformer	500	2,329	1,173
5	Central	Interface	500	1,289	43
6	Axton	Transformer	AEP	247	0
7	Mount Storm - Pruntytown	Line	AP	226	214
8	Lakeview - Clubhouse	Line	Dominion	0	24
9	Axton - Jacksons Ferry	Line	AEP	272	5
10	Danville - East Danville	Line	Dominion	210	36
11	Kanawha - Matt Funk	Line	AEP	90	82
12	Bedington	Transformer	AP	904	446
13	Beechwood - Kerr Dam	Line	Dominion	405	248
14	Branchburg - Readington	Line	PSEG	2,152	546
15	Meadow Brook	Transformer	AP	1,245	320

Table 11 shows the congestion cost details of the top 15 constraints affecting Dominion North Carolina for the period beginning May 1, 2007 and ending April 30, 2008. The Bedington – Black Oak interface had the largest impact on congestion costs with a total of \$10.3 million or 46 percent of total congestion costs.

Table 11 Congestion cost details for the top 15 constraints affecting Dominion North Carolina: May 1, 2007 to April 30, 2008.

Constraint	Congestion Costs (Millions)										
	Day Ahead					Balancing					Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total			
Bedington - Black Oak	\$17.2	\$5.0	\$1.2	\$13.4	(\$3.1)	(\$0.1)	(\$0.1)	(\$3.1)	\$10.3		
Cloverdale - Lexington	\$5.9	\$0.9	\$1.4	\$6.4	(\$0.7)	\$0.0	(\$0.0)	(\$0.8)	\$5.6		
AP South	\$2.1	\$0.3	\$0.4	\$2.2	(\$0.2)	\$0.0	(\$0.0)	(\$0.2)	\$2.0		
Kammer	\$1.0	\$0.0	\$0.3	\$1.3	(\$0.2)	\$0.0	(\$0.0)	(\$0.2)	\$1.1		
Central	(\$1.4)	(\$0.4)	(\$0.0)	(\$0.9)	\$0.0	(\$0.0)	(\$0.0)	\$0.0	(\$0.9)		
Axton	\$1.2	\$0.4	\$0.0	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7		
Mount Storm - Pruntytown	\$1.0	\$0.1	\$0.0	\$1.0	(\$0.3)	(\$0.0)	(\$0.0)	(\$0.3)	\$0.7		
Lakeview - Clubhouse	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.0)	(\$0.3)	\$0.0	(\$0.6)	(\$0.6)		
Axton - Jacksons Ferry	\$0.9	\$0.3	\$0.0	\$0.6	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.6		
Danville - East Danville	\$0.7	\$0.3	\$0.1	\$0.5	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.5		
Kanawha - Matt Funk	\$0.8	\$0.3	\$0.1	\$0.6	(\$0.1)	(\$0.0)	(\$0.0)	(\$0.1)	\$0.5		
Bedington	\$0.7	\$0.2	\$0.1	\$0.5	(\$0.1)	\$0.0	(\$0.0)	(\$0.1)	\$0.5		
Beechwood - Kerr Dam	\$2.0	\$0.8	\$0.0	\$1.2	(\$0.8)	(\$0.1)	(\$0.0)	(\$0.8)	\$0.4		
Branchburg - Readington	(\$1.0)	(\$0.4)	(\$0.0)	(\$0.7)	\$0.2	\$0.0	\$0.0	\$0.2	(\$0.4)		
Meadow Brook	(\$0.8)	(\$0.2)	\$0.0	(\$0.6)	\$0.2	\$0.0	\$0.0	\$0.2	(\$0.4)		

Table 12 shows the largest deltas by constraint for the period ending April 30, 2008 compared to the period ending April 30, 2007. Congestion costs for the Bedington – Black Oak interface and the Mount Storm – Pruntytown line decreased by \$3.9 million and \$3.8 million, respectively. Congestion costs for the Cloverdale – Lexington line and the AP South interface increased by \$1.8 million and \$1.6 million, respectively. In total, congestion costs decreased by \$4.3 million across these four constraints. Similarly, total congestion costs for Dominion North Carolina decreased by \$2.5 million.

Table 12 Top 15 constraint congestion cost deltas from the prior period: May 1, 2007 to April 30, 2008 minus May 1, 2006 to April 30, 2007.

Constraint	Congestion Cost Deltas (Millions)								
	Day Ahead				Balancing				Grand Total
	Load Payments	Generation Credits	Explicit	Total	Load Payments	Generation Credits	Explicit	Total	
Bedington - Black Oak	(\$11.6)	(\$7.5)	(\$0.1)	(\$4.2)	(\$0.9)	(\$2.5)	(\$1.3)	\$0.3	(\$3.9)
Mount Storm - Pruntytown	(\$7.1)	(\$3.7)	(\$0.4)	(\$3.8)	(\$0.4)	(\$0.8)	(\$0.3)	\$0.0	(\$3.8)
Cloverdale - Lexington	(\$0.7)	(\$1.6)	\$0.1	\$1.1	\$0.7	(\$0.1)	(\$0.0)	\$0.8	\$1.8
AP South	\$0.4	(\$0.3)	\$0.3	\$1.0	\$0.1	(\$0.5)	(\$0.0)	\$0.6	\$1.6
Cedar Grove - Roseland	\$3.5	\$1.7	(\$0.0)	\$1.7	\$0.1	\$0.3	\$0.1	(\$0.2)	\$1.6
Kanawha - Matt Funk	(\$1.6)	(\$1.0)	(\$0.0)	(\$0.6)	(\$0.5)	(\$0.1)	(\$0.2)	(\$0.6)	(\$1.2)
Branchburg - Readington	\$3.0	\$1.5	(\$0.1)	\$1.5	(\$0.3)	\$0.2	\$0.0	(\$0.5)	\$1.0
Danville - East Danville	(\$1.3)	(\$0.5)	(\$0.1)	(\$1.0)	(\$0.1)	(\$0.1)	\$0.0	(\$0.0)	(\$1.0)
Meadow Brook	\$0.8	\$0.6	\$0.6	\$0.8	\$0.2	\$0.0	(\$0.1)	\$0.1	\$0.9
Bedington	\$0.0	(\$0.1)	\$0.0	\$0.2	\$0.1	(\$0.4)	\$0.0	\$0.5	\$0.7
Lakeview - Clubhouse	\$0.0	\$0.0	\$0.0	\$0.0	(\$1.0)	(\$0.3)	\$0.0	(\$0.6)	(\$0.6)
Muskingum River - Ohio Central	\$0.0	\$0.0	(\$0.0)	\$0.0	(\$0.2)	\$0.4	(\$0.0)	(\$0.7)	(\$0.6)
Brighton	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.1	(\$0.5)	\$0.0	\$0.6	\$0.6
East	\$0.8	\$0.4	\$0.0	\$0.5	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.5
Axton	(\$2.3)	(\$1.6)	\$0.0	(\$0.7)	\$0.0	(\$0.2)	(\$0.0)	\$0.2	(\$0.5)

Conclusion

Congestion costs in the Dominion service territory of North Carolina decreased from 2005/2006 to 2006/2007 by \$5.5 million or 18 percent. Load congestion payments increased by two percent from 2005/2006 to 2006/2007, while generation congestion credits increased by nine percent from 2005/2006 to 2006/2007. The increase in generation congestion credits was greater than the increase in load congestion payments, resulting in an overall decrease in the net congestion bill from 2005/2006 to 2006/2007. The congestion costs associated with the Bedington – Black Oak interface, which was the largest contributor to congestion costs during the 2005/2006 and the 2006/2007 periods, decreased by \$2.5 million. The largest decrease in congestion costs was from the Kammer transformer, which had a decrease of \$5.1 million.

Congestion continued to decrease from the 2006/2007 period to the 2007/2008 period and in total decreased by \$2.5 million. Load congestion payments decreased by 42 percent from 2006/2007 to 2007/2008, while generation congestion credits decreased by 71 percent from 2006/2007 to 2007/2008. The decrease in generation congestion credits was less than the decrease in load congestion payments, resulting in an overall decrease in the net congestion bill from 2006/2007 to 2007/2008. The congestions costs associated with the Bedington – Black Oak interface decreased by \$3.9 million. The congestion costs associated with the Mount Storm – Pruntytown line decreased by \$3.8 million. The Cloverdale – Lexington line and the AP South interface had the largest positive increases in congestion costs from the 2006/2007 period to the 2007/2008 period.

ARRs and FTRs are designed to provide a hedge against congestion costs. This report does not include data on either ARRs or FTRs. That information will be provided in a future report. The data on ARRs and FTRs and congestion need to be considered together when evaluating the net impact of congestion on an area.

Congestion Definitions

Table 13 Congestion Definitions

Congestion Category	Calculation
Day-Ahead Load Congestion Payments	Day-Ahead Demand MWh * Day-Ahead CLMP
Day-Ahead Generation Congestion Credits	Day-Ahead Supply MWh * Day-Ahead CLMP
Day-Ahead Net Congestion Bill	Day-Ahead Load Congestion Payments - Day-Ahead Generation Congestion Credits
Day-Ahead Explicit Congestion Costs	Day-Ahead Transaction MW * (Day-Ahead Sink CLMP - Day-Ahead Source CLMP)
Day-Ahead Total Congestion Costs	Day-Ahead Load Congestion Payments - Day-Ahead Generation Congestion Credits + Day-Ahead Explicit Congestion Costs
Balancing Load Congestion Payments	Balancing Demand MWh * Real-Time CLMP
Balancing Generation Congestion Credits	Balancing Supply MWh * Real-Time CLMP
Balancing Net Congestion Bill	Balancing Load Congestion Payments - Balancing Generation Congestion Credits
Balancing Explicit Congestion Costs	Balancing Transaction MW * (Real-Time Sink CLMP - Real-Time Source CLMP)
Balancing Total Congestion Costs	Balancing Load Congestion Payments - Balancing Generation Congestion Credits + Balancing Explicit Congestion Costs
Total Congestion Costs	Day-Ahead Total Congestion Costs + Balancing Total Congestion Costs

MWh Category	Definition
Day-Ahead Demand MWh	Cleared Demand, Decrement Bids, Energy Sale Transactions
Day-Ahead Supply MWh	Cleared Generation, Increment Bids, Energy Purchase Transactions
Real-Time Demand MWh	Load and Energy Sale Transactions
Real-Time Supply MWh	Generation and Energy Purchase Transactions
Balancing Demand MWh	Real-Time Demand MWh - Day-Ahead Demand MWh
Balancing Supply MWh	Real-Time Supply MWh - Day-Ahead Supply MWh