



# Market Efficiency Analysis Progress Report

Transmission Expansion Advisory Committee  
April 5, 2007

- Energy market simulation analysis of 502 Junction-Loudoun 500 kV line completed for all sensitivity scenarios for 2007, 2010 and 2013.
  - Change in FTR credits by zone and change in production cost by zone compiled for 2007 base run
- Energy market simulation analysis completed for 2007, 2010 and 2013 base assumption cases for:
  - Susquehanna-Roseland 500 kV
  - Bossards-Roseland 500 kV
  - Amos-Kempton circuit
  - Kempton-Deans circuit
  - Amos-Kempton-Deans circuit
  - Possum Point-Calvert Cliffs-Indian River-Salem circuit
  - Kammer-Prexy-Conemaugh-TMI circuit
  - South Canton-Keystone-Sunbury circuit

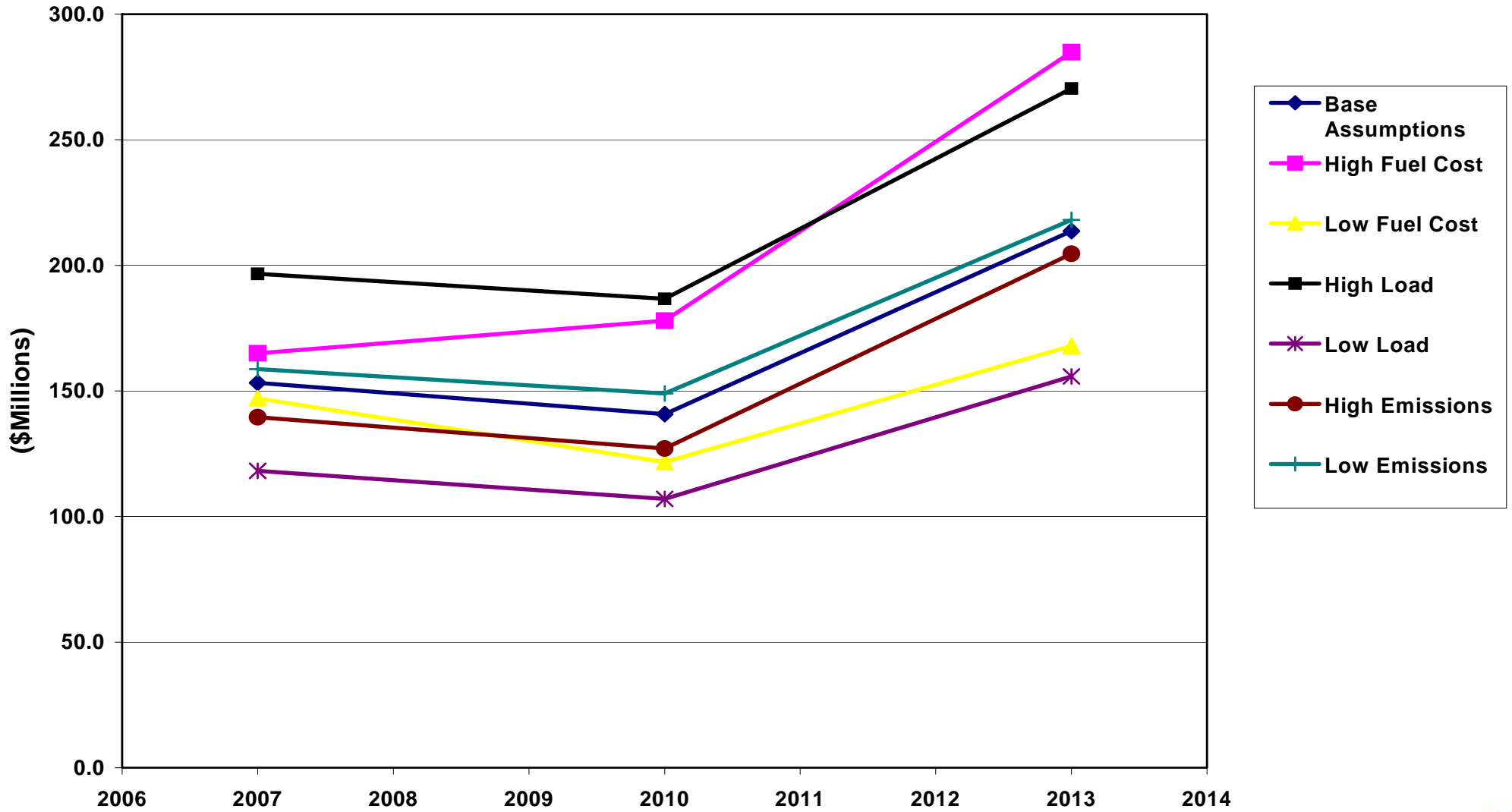


# Progress Report of Energy Market Simulation Analysis for 502 Junction-Loudoun 500 kV Line

Sensitivity	Year				
	2007	2010	2013	2016	2021
Base Assumptions	X	X	X	X	X
High Fuel	X	X	X	X	X
Low Fuel	X	X	X	X	X
High Load	X	X	X	X	X
Low Load	X	X	X	X	X
High Emissions	X	X	X	X	X
Low Emission	X	X	X	X	X
High Generation	n/a	n/a	n/a	X	X
Low Generation	n/a	n/a	n/a	X	X
Others ??	X	X	X	X	X

For 502Junc-Mdwbrk-Loudoun 500 kV line, energy market simulation analysis complete for 2007, 2010 and 2013 including all sensitivity scenarios

## System Production Cost Savings associated with 502 Junction-Meadowbrook-Loudoun 500 kV Line





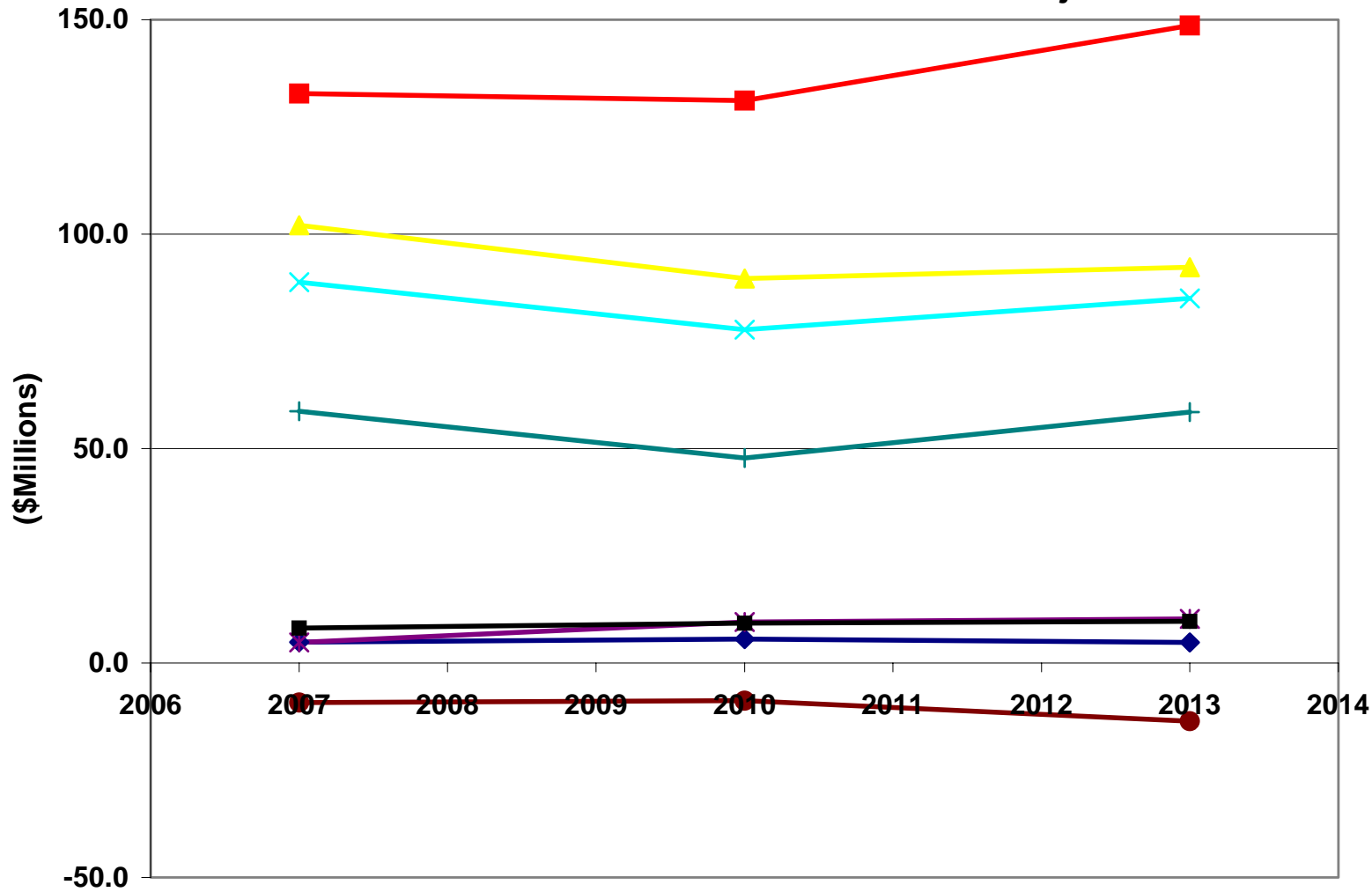
# Progress Report of Energy Market Simulation Analysis for Backbone Projects

Sensitivity	Year				
	2007	2010	2013	2016	2021
Base Assumptions	X	X	X	X	X
High Fuel	X	X	X	X	X
Low Fuel	X	X	X	X	X
High Load	X	X	X	X	X
Low Load	X	X	X	X	X
High Emissions	X	X	X	X	X
Low Emission	X	X	X	X	X
High Generation	n/a	n/a	n/a	X	X
Low Generation	n/a	n/a	n/a	X	X
Others ??	X	X	X	X	X

Base case analysis for 2007, 2010 and 2013 complete for following projects:

- Susq-Roseland
- Bossards-Roseland
- Amos-Kempton
- Kempton-Deans
- Amos-Kempton-Deans
- PossPt-CalvCliffs-IR-Salem
- Kammer-Prexy-Conema-TMI
- S.Canton-Keystone-Sunbury

## System Production Cost Savings associated with Various Backbone Projects<sup>(1)</sup>



(1) These savings are measured against the 2011 RTEP system including the 502 Junction-Meadowbrook-Loudoun 500 kV line



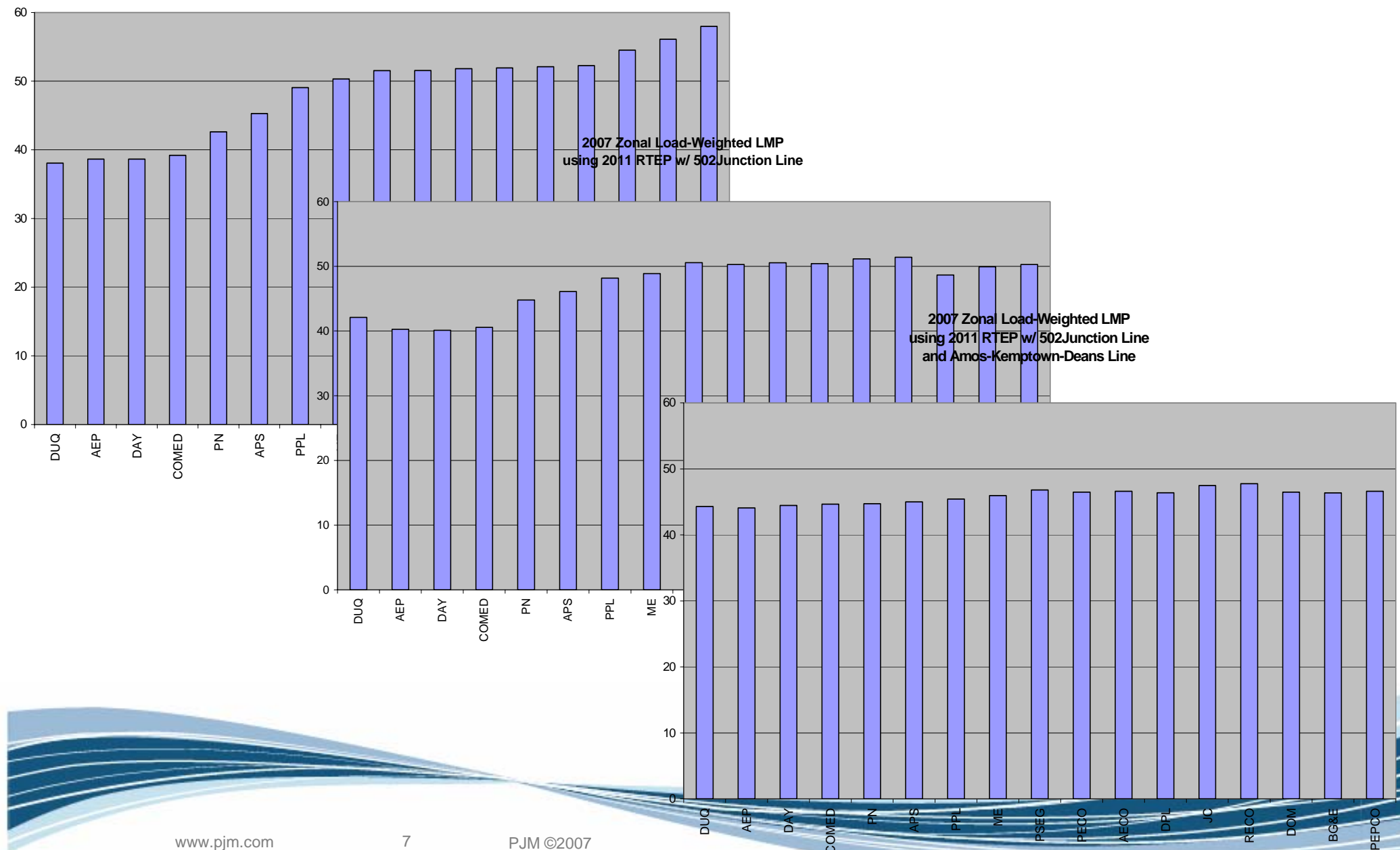


# Impact of Increased Transmission Capability on Zonal LMPs

2007 Zonal Load-Weighted LMP  
using 2011 RTEP w/o 502 Junction Line

2007 Zonal Load-Weighted LMP  
using 2011 RTEP w/ 502 Junction Line

2007 Zonal Load-Weighted LMP  
using 2011 RTEP w/ 502 Junction Line  
and Amos-Kempton-Deans Line





# Change in Zonal Load Payments & FTR Credits associated with 502 Junction-Loudoun Line

Zone	2007 Base Simulation w/o 502Junc-Loudoun line		2007 Base Simulation w/ 502Junc-Loudoun line		Delta Load Payment		Delta FTR Credit	Delta Load Payment minus Delta FTR Credit	
	Load Payment (\$)	\$/MWh	Load Payment (\$)	\$/MWh	(\$)	\$/MWh	(\$)	(\$)	\$/MWh
ACEC	618,618,364	51.82	603,210,345	50.53	-15,408,019	-1.29	-1,545,577	-13,862,443	-1.16
AEP	5,371,261,726	38.64	5,595,666,290	40.26	224,404,564	1.61	62,015,390	162,389,174	1.17
APS	2,339,348,764	45.29	2,382,018,354	46.11	42,669,590	0.83	-410,427,673	453,097,263	8.77
BG&E	1,978,166,180	56.11	1,760,499,769	49.94	-217,666,411	-6.17	-36,804,827	-180,861,584	-5.13
COED	4,164,080,516	39.18	4,310,488,946	40.56	146,408,430	1.38	-5,349,609	151,758,039	1.43
DOM	5,183,001,308	54.51	4,627,398,244	48.67	-555,603,064	-5.84	-358,988,286	-196,614,778	-2.07
DP&L	724,908,697	38.66	752,371,800	40.12	27,463,104	1.46	-5,745,651	33,208,754	1.77
DPLC	1,027,352,040	51.93	997,157,085	50.40	-30,194,955	-1.53	-5,172,447	-25,022,508	-1.26
DQE	558,563,943	38.06	617,669,745	42.09	59,105,802	4.03	16,292,179	42,813,622	2.92
JC	1,306,051,858	52.09	1,282,434,900	51.15	-23,616,958	-0.94	-10,442,764	-13,174,194	-0.53
ME	793,076,158	50.33	770,322,760	48.89	-22,753,399	-1.44	-16,144,623	-6,608,776	-0.42
PECO	2,139,352,180	51.56	2,086,785,257	50.29	-52,566,923	-1.27	-4,894,038	-47,672,885	-1.15
PEPCO	1,933,019,895	57.97	1,676,834,934	50.29	-256,184,961	-7.68	-17,042,605	-239,142,356	-7.17
PN	771,591,700	42.62	810,742,112	44.79	39,150,412	2.16	-9,748,947	48,899,359	2.70
PPL	2,091,095,307	49.06	2,052,912,311	48.16	-38,182,996	-0.90	-28,820,188	-9,362,808	-0.22
PSEG	2,501,099,258	51.53	2,454,367,529	50.57	-46,731,729	-0.96	-5,518,397	-41,213,332	-0.85
RECO	79,706,373	52.27	78,395,461	51.41	-1,310,912	-0.86	-71,899	-1,239,013	-0.81
Neptune	283,516,438	47.25	278,529,398	46.42	-4,987,040	-0.83	-108,482	-4,878,558	-0.81
<b>Total</b>	<b>33,863,810,704</b>	<b>46.72</b>	<b>33,137,805,238</b>	<b>45.72</b>	<b>-726,005,466</b>	<b>-1.00</b>	<b>-838,518,441</b>	<b>112,512,976</b>	<b>0.16</b>



# Change in Zonal Load Payment, FTR Credits & Production Costs associated with 502 Junction-Loudoun Line

Zone	Delta Load Payment			Delta Load Payment - FTR Credit			Delta Production Cost		
	(\$000)	% of Decrease	% of Increase	(\$000)	% of Decrease	% of Increase	(\$000)	% of Decrease	% of Increase
ACEC	-15,408	1.2%		-13,862	1.8%		-7,119	1.6%	
AEP	224,405		41.6%	162,389		18.2%	104,611		35.1%
APS	42,670		7.9%	453,097		50.8%	120,323		40.3%
BG&E	-217,666	17.2%		-180,862	23.2%		-41,354	9.2%	
COED	146,408		27.2%	151,758		17.0%	44,908		15.0%
DOM	-555,603	43.9%		-196,615	25.2%		-233,243	51.6%	
DP&L	27,463		5.1%	33,209		3.7%	11,162		3.7%
DPLC	-30,195	2.4%		-25,023	3.2%		-21,197	4.7%	
DQE	59,106		11.0%	42,814		4.8%	8,855		3.0%
JC	-23,617	1.9%		-13,174	1.7%		2,348		0.8%
ME	-22,753	1.8%		-6,609	0.8%		-10,314	2.3%	
PECO	-52,567	4.2%		-47,673	6.1%		-34,039	7.5%	
PEPCO	-256,185	20.2%		-239,142	30.7%		-73,519	16.3%	
PN	39,150		7.3%	48,899		5.5%	6,250		2.1%
PPL	-38,183	3.0%		-9,363	1.2%		-11,937	2.6%	
PSEG	-46,732	3.7%		-41,213	5.3%		-18,987	4.2%	
RECO	-1,311	0.1%		-1,239	0.2%		0		
Neptune	-4,987	0.4%		-4,879	0.6%		0		
<b>Total</b>	<b>-726,005</b>	<b>100.0%</b>	<b>100.0%</b>	<b>112,513</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-153,254</b>	<b>100.0%</b>	<b>100.0%</b>

**Total Decrease -1,265,207**  
**Total Increase 539,202**

**-779,653**  
**892,166**

**-451,710**  
**298,456**

- Develop future generation scenarios for 2016 and 2021 and continue sensitivity analysis
- Develop and incorporate carbon emission costs into sensitivity analysis
- Calculate impact of upgrades on RPM metrics
- Provide status updates as analysis progresses