# Table of Contents

Preface
SECTION 1 Introduction
Q3 2012 In Review
PJM Market Background
Conclusions
Role of MMU
Reporting
Monitoring
Market Design
Recommendations
Highlights
Section 2, Energy Market
Section 3, Operating Reserve
Section 4, Capacity
Section 5, Demand Response
Section 6, Net Revenue
Section 7, Environmental and Renewables
Section 8, Interchange Transactions
Section 9, Ancillary Services
Section 10, Congestion and Marginal Losses
Section 11, Planning
Section 12, Financial Transmission Rights and Auction
Revenue Rights
Total Price of Wholesale Power
Components of Total Price
SECTION 2 Energy Market
Highlights
Conclusion

Market Structure	20
Supply	20
Demand	23
Market Concentration	24
Local Market Structure and Offer Capping	25
Local Market Structure	26
Ownership of Marginal Resources	28
Type of Marginal Resources	29
Market Conduct: Markup	29
Real-Time Mark Up Conduct	30
Day-Ahead Mark Up Conduct	30
Market Performance	30
Markup	30
Real-Time Markup	31
Day-Ahead Markup	32
Frequently Mitigated Units and Associated Units	34
Market Performance: Load and LMP	36
Load	36
Locational Marginal Price (LMP)	45
Load and Spot Market	62
SECTION 3 Operating Reserve	65
Highlights	65
Conclusion	65
Operating Reserve Credits and Charges	66
Credit and Charge Categories	66
Operating Reserve Results	67
Operating Reserve Charges	67
Operating Reserve Rates	70
Deviations	73
Operating Reserve Credits by Category	74
Characteristics of Credits	75
Types of Units	75
Economic and Noneconomic Generation	77

i

Geography of Charges and Credits	78
Load Response Resource Operating Reserve Credits	81
Reactive Service	82
Operating Reserve Issues	83
Concentration of Operating Reserve Credits	83
Day-Ahead Unit Commitment for Reliability	85
Lost Opportunity Cost Credits	87
Black Start and Voltage Support Units	90
Up-to Congestion Transactions	91
Reactive Service Credits and Operating Reserve Credits	91
SECTION 4 Capacity Market	93
Highlights	93
Conclusion	94
Recommendations	97
Installed Capacity	97
RPM Capacity Market	98
Market Structure	98
Market Conduct	103
Market Performance	104
Generator Performance	108
Capacity Factor	108
Generator Performance Factors	108
Generator Forced Outage Rates	109
SECTION 5 Demand-Side Response (DSR)	117
Highlights	117
Conclusions	117
PJM Demand Side Programs	119
Participation in Demand Side Programs	119
Economic Program	120

SECTION 6 Net Revenue	127
Highlights	127
Net Revenue	127
Theoretical Energy Market Net Revenue	128
New Entrant Combustion Turbine	129
New Entrant Combined Cycle	129
New Entrant Coal Plant	130
SECTION 7 Environmental and Renewable	
Energy Regulations	133
Highlights	133
Conclusion	133
Environmental Regulation	134
Federal Control of NO <sub>x</sub> and SO <sub>2</sub> Emissions Allowances	134
Federal Environmental Regulation of Greenhouse Gas Emissions Federal Environmental Regulation of Reciprocating Internal	134
Combustion Engines (RICE)	135
State Regulation of Greenhouse Gas Emissions	136
Renewable Portfolio Standards	137
Emissions Controlled Capacity and Renewables in PJM Markets	141
Emission Controlled Capacity in the PJM Region	141
Wind Units	141
Solar Units	144
SECTION 8 Interchange Transactions	145
Highlights	145
Conclusion	145
Interchange Transaction Activity	146
Aggregate Imports and Exports	146
Real-Time Interface Imports and Exports	147
Real-Time Interface Pricing Point Imports and Exports	149
Day-Ahead Interface Imports and Exports	151
Day-Ahead Interface Pricing Point Imports and Exports	154
PJM and MISO Interface Prices	162

PJM and NYISO Interface Prices	163
Summary of Interface Prices between PJM and Organized Markets	165
Neptune Underwater Transmission Line to Long Island, New York	165
Linden Variable Frequency Transformer (VFT) facility	165
Operating Agreements with Bordering Areas	166
PJM and MISO Joint Operating Agreement	166
PJM and New York Independent System Operator Joint Operating	
Agreement (JOA)	167
Other Agreements/Protocols with Bordering Areas	167
Interchange Transaction Issues	168
Loop Flows	168
PJM Transmission Loading Relief Procedures (TLRs)	170
Up-To Congestion	171
Interface Pricing Agreements with Individual Balancing Authorities	174
Willing to Pay Congestion and Not Willing to Pay Congestion	178
Spot Imports	178
Real-Time Dispatchable Transactions	179
SECTION 9 Ancillary Service Markets	181
Highlights	183
Ancillary services costs per MW of load: 2001 - 2012	183
Conclusion	183
Regulation Market	184
Proposed Market Design Changes	184
Market Structure	185
Market Conduct	186
Market Performance	188
Synchronized Reserve Market	190
Market Structure	
Market Structure	190
Market Schucture	190 194
Market Conduct	194
Market Conduct Market Performance	194 195

Market Performance	201
Black Start Service	202
SECTION 10 Congestion and Marginal Losses	203
Highlights	203
Conclusion	203
Locational Marginal Price (LMP)	204
Components	204
Zonal Components	204
Energy Costs	206
Energy Accounting	206
Total Energy Costs	206
Marginal Losses	207
Marginal Loss Accounting	207
Total Marginal Loss Costs	208
Congestion	210
Congestion Accounting	210
Total Congestion	211
Congested Facilities	213
Congestion by Facility Type and Voltage	213
Constraint Duration	217
Constraint Costs	219
Congestion-Event Summary for MISO Flowgates	221
Congestion-Event Summary for the 500 kV System	223
SECTION 11 Generation and Transmission Planning	225
Highlights	225
Planned Generation and Retirements	225
Planned Generation Additions	225
Planned Deactivations	231
Actual Generation Deactivations in 2012	232
Updates on Key Backbone Facilities	234

SECTION 12 Financial Transmission and Auction	ı Revenue
Rights	235

Highlights	236
Conclusion	236
Financial Transmission Rights	236
Market Structure	237
Credit Issues	238
Patterns of Ownership	238
Market Performance	239
Auction Revenue Rights	252
Market Structure	253
Market Performance	254

# Figures

### **SECTION 1 Introduction**

Figure 1-1 PJM's footprint and its 19 control zones (See 2011 SOM, Figure 1-1)

2

#### SECTION 2 Energy Market

Figure 2-1 Average PJM aggregate supply curves: January through	
September, 2011 and 2012 (See 2011 SOM, Figure 2-1)	20
Figure 2-2 PJM footprint first nine months peak loads: 2003 to 2012	
(See 2011 SOM, Figure 2-2)	23
Figure 2-3 PJM peak-load comparison: Tuesday, July 17, 2012, and	
Thursday, July 21, 2011 (See 2011 SOM, Figure 2-3)	24
Figure 2-4 PJM hourly Energy Market HHI: January through	
September 2012 (See 2011 SOM, Figure 2-4)	25
Figure 2-5 Frequently mitigated units and associated units	
(By month): February, 2006 through September, 2012 (See 2011	
SOM, Figure 2-5)	35
Figure 2-6 Frequently mitigated units and associated units total	
months eligible: February, 2006 through September, 2012 (See	
2011 SOM, Figure 2-6)	36
Figure 2-7 PJM real-time accounting load: January through	
September for years 2011 and 2012 (See 2011 SOM, Figure 2-7)	37
Figure 2-8 PJM real-time monthly average hourly load: 2011	
through September of 2012 (See 2011 SOM, Figure 2-8)	38
Figure 2-9 PJM Heating and Cooling Degree Days for January	
through September for 2011 and 2012	38
Figure 2-10 PJM day-ahead load: January through September for	
years 2011 and 2012 (See 2011 SOM, Figure 2-9)	39
Figure 2-11 PJM day-ahead monthly average hourly load: 2011	
through September of 2012 (See 2011 SOM, Figure 2-10)	40

Figure 2-12 Day-ahead and real-time loads (Average hourly volumes): January through September of 2012 (See 2011 SOM,	
Figure 2-10)	42
Figure 2-13 Difference between day-ahead and real-time loads	
(Average daily volumes): January 2011 through September 2012	
(See 2011 SOM, Figure 2-12)	42
Figure 2-14 Day-ahead and real-time generation (Average hourly	
volumes): January through September of 2012 (See 2011 SOM,	
Figure 2-13)	45
Figure 2-15 Difference between day-ahead and real-time generation	
(Average daily volumes): January 2011 through September 2012	
(See 2011 SOM, Figure 2-14)	45
Figure 2-16 Average LMP for the PJM Real-Time Energy Market:	
January through September, 2011 and 2012 (See 2011 SOM,	
Figure 2-15)	46
Figure 2-17 PJM real-time, monthly, load-weighted, average LMP:	
2007 through September of 2012 (See 2011 SOM, Figure 2-16)	48
Figure 2-18 Spot average fuel price comparison: 2011 and January	
through September 2012 (\$/MMBtu) (See 2011 SOM, Figure 2-17)	48
Figure 2-19 Average spot fuel cost of generation of CP, CT, and CC:	
2011 and January through September 2012 (\$/MWh) (New Figure)	49
Figure 2-20 Price for the PJM Day-Ahead Energy Market: January	
through September, 2011 and 2012 (See 2011 SOM, Figure 2-18)	50
Figure 2-21 Day-ahead, monthly, load-weighted, average LMP: 2007	
through September of 2012 (See 2011 SOM, Figure 2-19)	52
Figure 2-22 Hourly volume of bid and cleared INC, DEC and Up-to	
Congestion bids (MW) by month: January, 2005 through	
September, 2012 (See 2011 SOM, Figure 2-20)	54
Figure 2-23 PJM day-ahead aggregate supply curves: 2012 example	
day (See 2011 SOM, Figure 2-21)	58
Figure 2-24 Real-time load-weighted hourly LMP minus day-ahead	
load-weighted hourly LMP: January through September, 2012 (See	
2011 SOM, Figure 2-22)	61
Figure 2-25 Monthly average of real-time minus day-ahead LMP:	
January through September, 2012 (See 2011 SOM, Figure 2-23)	61

Figure 2-26 PJM system hourly average LMP: January through September, 2012 (See 2011 SOM, Figure 2-24)	62
SECTION 3 Operating Reserve	
Figure 3-1 Weekly weighted average day-ahead operating reserve rate (\$/MWh): Calendar years 2011 and 2012 (See 2011 SOM, Figure 3-1)	71
Figure 3-2 Daily balancing operating reserve reliability rates (\$/MWh): Calendar years 2011 and 2012 (See 2011 SOM, Figure 3-2)	71
Figure 3-2) Figure 3-3 Daily balancing operating reserve deviation rates (\$/MWh): Calendar years 2011 and 2012 (See 2011 SOM, Figure 3-2)	71
Figure 3-4 Daily lost opportunity cost and canceled resources rates (\$/MWh): Calendar years 2011 and 2012 (See 2011 SOM,	
Figure 3-2) Figure 3-5 Daily average day-ahead generation from units scheduled as must run by PJM: January through September 2012 (New Figure)	72 86
Figure 3-6 Units scheduled as must run by PJM receiving day-ahead operating reserve credits: January through September 2012 (New Figure)	86
SECTION 4 Capacity Market	
Figure 4-1 PJM Locational Deliverability Areas (See the 2011 SOM, Figure A-3)	100
Figure 4-2 PJM RPM EMAAC subzonal LDAs (See the 2011 SOM, Figure A-4)	100
Figure 4-3 History of capacity prices: Calendar year 1999 through 2015 (See the 2011 SOM, Figure 4-1)	107

Figure 4-4 PJM equivalent outage and availability factors: Calendar	
years 2007 to 2012 (See the 2011 SOM, Table 4-1)	109

Figure 4-5 Trends in the PJM equivalent demand forced outage rate	
(EFORd): January through September, 2007 to 2012 (See the 2011	
SOM, Figure 4-3)	109
Figure 4-6 PJM January through September 2012 distribution of	
EFORd data by unit type (See the 2011 SOM, Figure 4-4)	110
Figure 4-7 PJM EFORd, XEFORd and EFORp: 2012 (See the 2011	
SOM, Figure 4-7)	115
Figure 4-8 PJM monthly generator performance factors: 2012	
(See the 2011 SOM, Table 4-8)	116

#### SECTION 5 Demand-Side Response (DSR)

Figure 5-1 Demand Response revenue by market: Calendar years	
2002 through 2011 and the first nine months of 2012 (See the	
2011 SOM, Figure 5-1)	119
Figure 5-2 Economic Program payments by month: Calendar years	
2007 through 2011 and January through September 2012 (See	
the 2011 SOM, Figure 5-2)	122

#### SECTION 6 Net Revenue

Figure 6-1 Energy Market net revenue factor trends: December	
2008 through September 2012 (New Figure)	131

# SECTION 7 Environmental and Renewable Energy Regulations

Figure 7-1 Spot monthly average emission price comparison: 2011	
and January through September 2012 (See 2011 SOM,	
Figure 7-1)	137
Figure 7-2 Average hourly real-time generation of wind units in	
PJM: January through September 2012 (See 2011 SOM,	
Figure 7-2)	142
Figure 7-3 Average hourly day-ahead generation of wind units in	
PJM: January through September 2012 (See 2011 SOM,	
Figure 7-3)	143

Figure 7-4 Marginal fuel at time of wind generation in PJM: January through September 2012 (See 2011 SOM, Figure 7-4) Figure 7-5 Average hourly real-time generation of solar units in	144	Figure 8-11 Monthly up-to congestion cleared bids in MWh: January, 2006 through September, 2012 (See 2011 SOM, Figure 8-11)	172
PJM: January through September 2012 (See 2011 SOM, Figure 7-5)	144	Figure 8-12 Total settlements showing positive, negative and net gains for up-to congestion bids with a matching Real-Time Energy Market transaction (physical) and without a matching	
SECTION 8 Interchange Transactions		Real-Time Energy Market transaction (financial): January	
Figure 8-1 PJM real-time and day-ahead scheduled imports and exports: January through September, 2012 (See 2011 SOM,		through September, 2012 (See 2011 SOM, Figure 8-12) Figure 8-13 Real-time interchange volume vs. average hourly LMP	174
Figure 8-1)	146	available for Duke and PEC imports: January through	
Figure 8-2 PJM real-time and day-ahead scheduled import and		September, 2012 (See 2011 SOM, Figure 8-13)	176
export transaction volume history: January 1999, through	1 4 7	Figure 8-14 Real-time interchange volume vs. average hourly LMP available for Duke and PEC exports: January through	
September 2012 (See 2011 SOM, Figure 8-2) Figure 8-3 PJM's footprint and its external interfaces (See 2011	147	September, 2012 (See 2011 SOM, Figure 8-14)	176
SOM, Figure 8-3)	161	Figure 8-15 Day-ahead interchange volume vs. average hourly LMP	170
Figure 8-4 Real-time and day-ahead daily hourly average price		available for Duke and PEC imports: January through	
difference (MISO Interface minus PJM/MISO): January through		September, 2012 (See 2011 SOM, Figure 8-15)	177
September, 2012 (See 2011 SOM, Figure 8-4)	162	Figure 8-16 Day-ahead interchange volume vs. average hourly LMP	
Figure 8-5 Real-time and day-ahead daily hourly average price		available for Duke and PEC exports: January through	
difference (NY proxy - PJM/NYIS): January through September,		September, 2012 (See 2011 SOM, Figure 8-16)	177
2012 (See 2011 SOM, Figure 8-5)	164	Figure 8-17 Spot import service utilization: January, 2009 through	
Figure 8-6 PJM, NYISO and MISO real-time and day-ahead border		September, 2012 (See 2011 SOM, Figure 8-17)	179
price averages: January through September, 2012 (See 2011 SOM, Figure 8-6)	165	SECTION 9 Ancillary Service Markets	
Figure 8-7 Neptune hourly average flow: January through		Figure 9-1 PJM Regulation Market HHI distribution: January	
September, 2012 (See 2011 SOM, Figure 8-7)	165	through September of 2010, 2011 and 2012 (See 2011 SOM,	
Figure 8-8 Linden hourly average flow: January through		Figure 9-1)	186
September, 2012 (See 2011 SOM, Figure 8-8)	166	Figure 9-2 Off peak and on peak regulation levels: January	
Figure 8-9 Credits for coordinated congestion management:		through September 2012 (See 2011 SOM, Figure 9-2)	187
January through September, 2012 (See 2011 SOM, Figure 8-9)	167	Figure 9-3 PJM Regulation Market daily weighted average market-	
Figure 8-10 Southwest and southeast actual and scheduled flows:		clearing price, marginal unit opportunity cost and offer price	
January, 2006 through September, 2012 (See 2011 SOM,		(Dollars per MWh): January through September 2012 (See 2011	
Figure 8–10)	170	SOM, Figure 9-3)	188

Figure 9-4 Monthly average regulation demand and price: January	
through September 2012 (See 2011 SOM, Figure 9-4)	189
Figure 9-5 Monthly weighted, average regulation cost and price:	
January through September 2012 (See 2011 SOM, Figure 9-5)	189
Figure 9-6 Ratio of Eligible Synchronized Reserve to Required	
Tier 2 for all cleared hours in the Mid-Atlantic Subzone: January	
through September 2012 (See 2011 SOM, Figure 9-6)	191
Figure 9-7 Mid-Atlantic Synchronized Reserve Subzone monthly	
average synchronized reserve required vs. Tier 2 scheduled MW:	
January through September 2012 (See 2011 SOM, Figure 9-7)	192
Figure 9-8 RFC Synchronized Reserve Zone, Mid-Atlantic Subzone	
daily average hourly synchronized reserve required, Tier 2 MW	
scheduled, and Tier 1 MW estimated: January through September	
2012 (See 2011 SOM, Figure 9-9)	192
Figure 9-9 Tier 2 synchronized reserve average hourly offer volume	
(MW): January through September 2012 (See 2011 SOM,	
Figure 9-10)	194
Figure 9-10 Average daily Tier 2 synchronized reserve offer by	
unit type (MW): January through September 2012 (See 2011	
SOM, Figure 9-11)	194
Figure 9-11 PJM RFC Zone Tier 2 synchronized reserve scheduled	
MW: January through September 2012 (See 2011 SOM,	
Figure 9-12)	195
Figure 9-12 Comparison of Mid-Atlantic Subzone Tier 2	
synchronized reserve weighted average price and cost (Dollars per	
MW): January through September 2012 (See 2011 SOM,	
Figure 9-16)	196
Figure 9-13 Tier 2 synchronized reserve purchases by month for	
the Mid-Atlantic Subzone: January through September 2012	
(See 2011 SOM, Figure 9-14)	197
Figure 9-14 Impact of Tier 2 synchronized reserve added MW to	
the RFC Synchronized Reserve Zone, Mid-Atlantic Subzone:	
January through September 2012 (See 2011 SOM, Figure 9-15)	197
Figure 9-15 Spinning events duration distribution curve, January	
through September 2009 to 2012 (See 2011 SOM, Figure 9-17)	200

Figure 9-16 Hourly components of DASR clearing price: January	
through September 2012 (See 2011 SOM, Figure 9-18)	201

## SECTION 10 Congestion and Marginal Losses

Figure 10-1 PJM monthly congestion (Dollars (Millions)): January	
2008 to September 2012 (New Figure)	211
Figure 10-2 Location of the top 10 constraints affecting PJM	
congestion costs: January through September 2012 (New Figure)	221

### SECTION 11 Generation and Transmission Planning

Figure 11-1 Unit retirements in PJM Calendar year 2011 through	
2019 (See 2011 SOM, Figure 11-1)	231

# SECTION 12 Financial Transmission and Auction Revenue Rights

Figure 12-1 Cleared auction volume (MW) as a percent of total FTR	
cleared volume by calendar month: June 2004 through September	-
2012 (See 2011 SOM, Figure 12-2)	242
Figure 12-2 Long Term, Annual and Monthly FTR Auction bid and	
cleared volume: June 2003 through September 2012 (See 2011	
SOM, Figure 12-3)	243
Figure 12-3 Monthly FTR Forfeitures for physical and financial	
participants: June 2010 through August 2012 (New Figure)	243
Figure 12-4 Ten largest positive and negative revenue producing	
FTR sinks purchased in the Monthly Balance of Planning Period	
FTR Auctions: Planning period 2012 to 2013 through	
September 30, 2012 (See 2011 SOM, Figure 12-11)	246
Figure 12-5 Ten largest positive and negative revenue producing	
FTR sources purchased in the Monthly Balance of Planning	
Period FTR Auctions: Planning period 2012 to 2013 through	
September 30, 2012 (See 2011 SOM, Figure 12-12)	246

Figure 12-6 FTR payout ratio with adjustments by month, excluding and including excess revenue distribution: January 2004 to September 2012	
(See 2011 SOM, Figure 12-13)	249
Figure 12-7 Ten largest positive and negative FTR target allocations summed by sink: Planning period 2012 to 2013 through	
September 30, 2012 (See 2011 SOM, Figure 12-14)	250
Figure 12-8 Ten largest positive and negative FTR target allocations summed by source: Planning period 2012 to 2013 through September 30, 2012 (See 2011 SOM, Figure 12-15)	250
Figure 12-9 FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: January 2005 through September 2012	230
(New Figure)	251
Figure 12-10 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub: Planning period 2012 to 2013 through	
September 30, 2012 (See 2011 SOM, Figure 12-16)	255

2012 Quarterly State of the Market Report for PJM: January through September

# Tables

## **SECTION 1 Introduction**

Table 1-1 The Energy Market results were competitive (See 2011	
SOM, Table 1-1)	4
Table 1-2 The Capacity Market results were competitive (See 2011	
SOM, Table 1-2)	4
Table 1-3 The Regulation Market results were not competitive (See	
2011 SOM, Table 1-3)	5
Table 1-4 The Synchronized Reserve Markets results were competitive	
(See 2011 SOM, Table 1-4)	5
Table 1-5 The Day-Ahead Scheduling Reserve Market results were	
competitive (See 2011 SOM, Table 1-5)	6
Table 1-6 The FTR Auction Markets results were competitive (see	
2011 SOM, Table 1-6)	6
Table 1-7 Total price per MWh by category and total revenues by	
category: January through September 2011 and 2012 (See 2011	
SOM, Table 1-7)	16

## SECTION 2 Energy Market

Table 2-1 The Energy Market results were competitive (See 2011	
SOM, Table 2-1)	17
Table 2-2 PJM generation (By fuel source (GWh)): January through	
September 2011 and 2012 (See 2011 SOM, Table 2-2)	21
Table 2-3 PJM Generation (By fuel source (GWh)): January through	
September 2011 and 2012; excluding ATSI and DEOK zones (See	
2011 SOM, Table 2-2)	21
Table 2-4 Distribution of MW for dispatchable unit offer prices:	
January through September of 2012 (See 2011 SOM, Table 2-3)	22
Table 2-5 Distribution of MW for self-scheduled unit offer prices:	
January through September of 2012 (See 2011 SOM, Table 2-3)	22

Table 2-6 Actual, PJM footprint peak loads: January through	
September of 2003 to 2012 (See 2011 SOM, Table 2-4)	23
Table 2-7 PJM hourly Energy Market HHI: January through	
September 2011 and 2012 (See 2011 SOM, Table 2-5)	24
Table 2-8 PJM hourly Energy Market HHI (By supply segment):	
January through September 2011 and 2012 (See 2011 SOM,	
Table 2-6)	25
Table 2-9 Offer-capping statistics: January through September	
from 2008 to 2012 (See 2011 SOM, Table 2-7)	25
Table 2-10 Real-time offer-capped unit statistics: January through	
September 2012 (See 2011 SOM, Table 2-8)	26
Table 2-11 Three pivotal supplier results summary for regional	
constraints: January through September 2012 (See 2011 SOM,	
Table 2-9)	27
Table 2-12 Three pivotal supplier test details for regional	
constraints: January through September 2012 (See 2011 SOM,	
Table 2-10)	27
Table 2-13 Summary of three pivotal supplier tests applied for	
regional constraints: January through September 2012 (See	
2011 SOM, Table 2-11)	28
Table 2-14 Marginal unit contribution to PJM real-time,	
load-weighted LMP (By parent company): January through	
September 2012 (See 2011 SOM, Table 2-12)	28
Table 2-15 Marginal unit contribution to PJM day-ahead,	
load-weighted LMP (By parent company): January through	
September, 2012 (See 2011 SOM, Table 2-13)	29
Table 2-16 Type of fuel used (By real-time marginal units):	
January through September, 2012 (See 2011 SOM, Table 2-14)	29
Table 2-17 Day-ahead marginal resources by type/fuel: January	
through September, 2012 (See 2011 SOM, Table 2-15)	29
Table 2-18 Average, real-time marginal unit markup index	
(By offer price category): January through September (See	_
2011 SOM, Table 2-16)	30

Table 2-19 Average marginal unit markup index (By offer price category): January through September, 2012 (See 2011 SOM, Table 2-17)	30	Table 2–31 PJM annual Summer THI, Winter WWP and average temperature (Degrees F): cooling, heating and shoulder months of 2007 through June of 2012 (See 2011 SOM, Table 2–30)	38
Table 2-20 Markup component of the overall PJM real-time,	30	Table 2-32 PJM day-ahead average load: January through	50
load-weighted, average LMP by primary fuel type and unit type:		September for years 2001 through 2012 (See 2011 SOM,	
January through September 2012 (See 2011 SOM, Table 2-18)	31	Table 2-31)	40
Table 2-21 Monthly markup components of real-time load-weighted		Table 2-33 Cleared day-ahead and real-time load (MWh): January	
LMP: January through September 2012 (See 2011 SOM,		through September for years 2011 and 2012 (See 2011 SOM,	
Table 2–19)	31	Table 2-32)	41
Table 2-22 Average real-time zonal markup component: January		Table 2-34 PJM real-time average hourly generation: January	
through September 2012 (See 2011 SOM, Table 2-20)	32	through September for years 2003 through 2012 (See 2011 SOM,	
Table 2-23 Average real-time markup component (By LMP		Table 2–33)	43
category): January through September 2012 (See 2011 SOM,		Table 2-35 PJM day-ahead average hourly generation: January	
Table 2–21)	32	through September for years 2003 through 2012 (See 2011	
Table 2-24 Markup component of the overall PJM day-ahead,		SOM, Table 2-34)	44
load-weighted, average LMP by primary fuel type and unit type:		Table 2-36 Day-ahead and real-time generation (MWh): January	
January through September, 2012 (See 2011 SOM, Table 2-22)	33	through September for years 2011 and 2012 (See 2011 SOM,	
Table 2-25 Monthly markup components of day-ahead,		Table 2–35)	44
load-weighted LMP: January through September, 2012 (See 2011		Table 2-37 PJM real-time, average LMP (Dollars per MWh):	
SOM, Table 2–23)	33	January through September, 1998 through 2012 (See 2011 SOM,	
Table 2-26 Day-ahead, average, zonal markup component: January		Table 2-36)	47
through September, 2012 (See 2011 SOM, Table 2-24)	33	Table 2-38 PJM real-time, load-weighted, average LMP (Dollars per	
Table 2-27 Average, day-ahead markup (By LMP category): January		MWh): January through September, 1998 through 2012 (See 2011	
through September, 2012 (See 2011 SOM, Table 2-25)	34	SOM, Table 2-37)	47
Table 2-28 Number of frequently mitigated units and associated		Table 2-39 PJM real-time annual, fuel-cost-adjusted, load-weighted	
units (By month): January through September, 2012 (See 2011	2.4	average LMP (Dollars per MWh): Year-over-year method (See 2011	40
SOM, Table 2–26)	34	SOM, Table 2-11)	49
Table 2-29 Frequently mitigated units and associated units total		Table 2-40 Components of PJM real-time, annual, load-weighted,	50
months eligible: January through September, 2011 and 2012	25	average LMP: January through September 2012 Table 2-41 PJM day-ahead, average LMP (Dollars per MWh):	50
(See 2011 SOM, Table 2-27) Table 2-30 PJM real-time average hourly load: January through	35	January through September, 2001 through 2012 (See 2011 SOM,	
September for years 1998 through 2012 (See 2011 SOM,		Table 2-40)	51
Table 2-28)	37	Table 2-42 PJM day-ahead, load-weighted, average LMP (Dollars per	51
		MWh): January through September, 2001 through 2012 (See 2011	
		SOM, Table 2-41)	51

60

63

63

67

67

67

68

69

70

70

72

73

74

74

Table 2-43 Components of PJM day-ahead, annual, load-weighted,		Table 2-55 Frequency distribution by hours of PJM real-time and
average LMP (Dollars per MWh): January through September, 2012		day-ahead load-weighted hourly LMP difference (Dollars per
(See 2011 SOM, Table 2-42)	52	MWh): January through September, 2007 through 2012 (See 2011
Table 2-44 Hourly average volume of cleared and submitted INCs,		SOM, Table 2-52)
DECs by month: January, 2011 through September, 2012 (See		Table 2-56 Monthly average percentage of real-time self-supply
2011 SOM, Table 2-43)	53	load, bilateral-supply load and spot-supply load based on parent
Table 2-45 Hourly average of cleared and submitted up-to		companies: 2011 through 2012 (See 2011 SOM, Table 2-53)
congestion bids by month: January, 2011 through September,		Table 2-57 Monthly average percentage of day-ahead self-supply
2012 (See 2011 SOM, Table 2-44)	54	load, bilateral supply load, and spot-supply load based on parent
Table 2-46 Type of day-ahead marginal units: January through		companies: 2011 through 2012 (See 2011 SOM, Table 2-54)
September, 2012 (See 2011 SOM, Table 2-45)	54	
Table 2-47 PJM INC and DEC bids by type of parent organization		SECTION 3 Operating Reserve
(MW): January through September, 2011 and 2012 (See 2011		Table 3-1 Operating reserve credits and charges (See 2011 SOM,
SOM, Table 2-46)	55	Table 3-1)
Table 2-48 PJM up-to congestion transactions by type of parent		Table 3-2 Operating reserve deviations (See 2011 SOM, Table 3-2)
organization (MW): January through September, 2011 and 2012		Table 3-3 Total operating reserve charges: January through
(See 2011 SOM, Table 2-47)	55	September 2011 and 2012 (See 2011 SOM, Table 3-6)
Table 2-49 PJM virtual offers and bids by top ten locations (MW):		Table 3-4 Monthly operating reserve charges: Calendar years 2011
January through September, 2011 and 2012 (See 2011 SOM,		and 2012 (See 2011 SOM, Table 3-7)
Table 2-48)	56	Table 3-5 Monthly balancing operating reserve charges by category:
Table 2-50 PJM cleared up-to congestion import bids by top ten		Calendar years 2011 and 2012 (See 2011 SOM, Table 3-8)
source and sink pairs (MW): January through September, 2011		Table 3-6 Regional balancing charges allocation: January through
and 2012 (See 2011 SOM, Table 2-49)	57	September 2011 (See 2011 SOM, Table 3-9)
Table 2-51 PJM cleared up-to congestion export bids by top ten		Table 3-7 Regional balancing charges allocation: January through
source and sink pairs (MW): January through September, 2011		September 2012 (See 2011 SOM, Table 3-9)
and 2012 (See 2011 SOM, Table 2-49)	57	Table 3-8 Balancing operating reserve rates (\$/MWh): January
Table 2-52 PJM cleared up-to congestion wheel bids by top ten		through September 2011 and 2012 (See 2011 SOM, Table 3-10)
source and sink pairs (MW): January through September, 2011		Table 3-9 Operating reserve rates statistics (\$/MWh): January
and 2012 (See 2011 SOM, Table 2-49)	58	through September 2012 (See 2011 SOM, Table 3-11)
Table 2-53 Day-ahead and real-time average LMP (Dollars per		Table 3-10 Monthly balancing operating reserve deviations (MWh):
MWh): January through September, 2011 and 2012 (See 2011		Calendar years 2011 and 2012 (See 2011 SOM, Table 3-3)
SOM, Table 2-50)	59	Table 3-11 Regional charges determinants (MWh): January through
Table 2-54 Day-ahead and real-time average LMP (Dollars per		September 2012 (See 2011 SOM, Table 3-4)
MWh): January through September, 2001 through 2012 (See		
2011 SOM, Table 2-51)	59	

Table 3-12 Credits by operating reserve category: January through September 2011 and 2012 (See 2011 SOM, Table 3-12)	75
Table 3-13 Credits by unit types (By operating reserve category): January through September 2012 (See 2011 SOM, Table 3-13)	75
Table 3-14 Credits by operating reserve category (By unit type): January through September 2012 (See 2011 SOM, Table 3-14)	76
Table 3-15 Credits by unit type: January through September 2011 and 2012 (New Table)	76
Table 3-16 Credits paid to wind units: Calendar years 2011 and 2012 (See 2011 SOM, Table 3-15)	77
Table 3-17 Day-ahead and real-time generation (GWh): January through September 2012 (New Table)	77
Table 3-18 Day-ahead and real-time economic and noneconomicgeneration (GWh): January through September 2012 (New Table)	77
Table 3-19 Day-ahead and real-time generation receiving operatingreserve credits (GWh): January through September 2012	
(New Table) Table 3-20 Geography of charges and credits: January through	78
September 2012 (New Table) Table 3-21 Monthly balancing operating reserve charges and	79
credits to generators (Eastern Region): January through September 2012 (See 2011 SOM, Table 3-17)	80
Table 3-22 Monthly balancing operating reserve charges and credits to generators (Western Region): January through	
September 2012 (See 2011 SOM, Table 3-18) Table 3-23 Percentage of unit credits and charges of total credits	80
and charges: Calendar years 2011 and 2012 (See 2011 SOM, Table 3-19)	81
Table 3-24 Day-ahead and balancing operating reserve for loadresponse credits: Calendar year 2011 through September 2012	
(See 2011 SOM, Table 3-20) Table 3-25 Monthly reactive service credits: Calendar years 2011	82
and 2012 (See 2011 SOM, Table 3-21) Table 3-26 Reactive service credits by unit type: January through	82
September 2012 (See 2011 SOM, Table 3-22)	83

Table 3-27 Top 10 operating reserve credits units (By percent of total	
system): Calendar years 2001 through September 2012 (See 2011	
SOM, Table 3-23)	83
Table 3-28 Top 10 units and organizations operating reserve credits:	
January through September 2012 (New Table)	84
Table 3-29 Daily operating reserve credits HHI: January through	
September 2012 (See 2011 SOM, Table 3-34)	84
Table 3-30 Identification of balancing operating reserve credits	
received by the top 10 units by category and region: January	
through September 2012 (See 2011 SOM, Table 3-35)	84
Table 3-31 Average operating reserve rates before and after	
September 13, 2012 (New Table)	85
Table 3-32 Day-ahead generation from pool-scheduled combustion	
turbines and engines (GWh): Calendar years 2011 and 2012 (New	
Table)	88
Table 3-33 Lost opportunity cost credits paid to pool-scheduled	
combustion turbines and engines by scenario (New Table)	88
Table 3-34 Day-ahead generation (GWh) from pool-scheduled	
turbines and engines receiving lost opportunity cost credits by	
value (New Table)	89
Table 3-35 Impact on energy market lost opportunity cost credits	
of rule changes: January through September 2012 (New Table)	90
Table 3-36 Impact on energy market lost opportunity cost credits	
of proposed rule changes: January through September 2012	
(New Table)	90
Table 3-37 Up-to Congestion Transactions Impact on the Operating	
Reserve Rates: January through September 2012 (See 2011 SOM,	
Table 3-44)	91
Table 3-38 Impact of credits paid to units providing reactive	
services on the balancing operating reserve rates (\$/MWh):	
January through September 2012 (New Table)	92

## SECTION 4 Capacity Market

Table 4-1 The Capacity Market results were competitive (See the	
2011 SOM, Table 4-1)	93
Table 4-2 RPM Related MMU Reports	96
Table 4-3 PJM installed capacity (By fuel source): January 1,	
May 31, June 1, and September 30, 2012 (See the 2011 SOM,	
Table 4-3)	98
Table 4-4 RPM generation capacity additions: 2007/2008 through	
2015/2016 (See 2011 SOM, Table 4-5)	98
Table 4-5 RSI results: 2012/2013 through 2015/2016 RPM Auctions	
(See the 2011 SOM, Table 4-8)	99
Table 4-6 RPM load management statistics by LDA: June 1, 2011 to	
June 1, 2015 <sup>,</sup> (See the 2011 SOM, Table 4-10)	102
Table 4-7 RPM load management cleared capacity and ILR:	
2007/2008 through 2015/2016" (See the 2011 SOM, Table 4-11)	103
Table 4-8 RPM load management statistics: June 1, 2007 to June 1,	
2015 <sup>,</sup> (See the 2011 SOM, Table 4-12)	103
Table 4-9 ACR statistics: Auctions conducted in third quarter, 2012	
(See the 2011 SOM, Table 4-14)	104
Table 4-10 Capacity prices: 2007/2008 through 2015/2016 RPM	
Auctions (See the 2011 SOM, Table 4-21)	105
Table 4-11 RPM revenue by type: 2007/2008 through 2015/2016 <sup>,</sup>	
(See the 2011 SOM, Table 4-22)	106
Table 4-12 RPM revenue by calendar year: 2007 through 2016	
(New Table)	106
Table 4-13 RPM cost to load: 2011/2012 through 2015/2016 RPM	
Auctions <sup>,</sup> (See the 2011 SOM, Table 4–23)	107
Table 4-14 PJM capacity factor (By unit type (GWh)); January	
through September 2011 and 2012 (See the 2011 SOM,	
Table 4-24)	108
Table 4-15 PJM EFORd data for different unit types: 2007 to 2012	
(See the 2011 SOM, Table 4-25)	110
Table 4-16 OMC Outages: January through September 2012	
(See the 2011 SOM, Table 4-30)	112

Table 4-17 PJM EFORd vs. XEFORd: January through September	
2012 (See the 2011 SOM, Table 4-31)	113
Table 4-18 Contribution to EFOF by unit type by cause: January	
through September 2012 (See the 2011 SOM, Table 4-27)	114
Table 4-19 Contributions to Economic Outages: January through	
September 2012 (See the 2011 SOM, Table 4-28)	114
Table 4-20 PJM EFORd, XEFORd and EFORp data by unit type:	
January through September 2012 (See the 2011 SOM, Table 4-35)	115
SECTION 5 Demand-Side Response (DSR)	
Table 5-1 Overview of Demand Side Programs (See the 2011 SOM,	
Table 5-1)	119
Table 5-2 Economic Program registration on peak load days:	
Calendar years 2002 to 2011 and January through September	
2012 (See the 2011 SOM, Table 5-2)	120
Table 5-3 Economic Program registrations on the last day of the	
month: 2008 through September 2012 (See the 2011 SOM,	
Table 5-3)	120
Table 5-4 Distinct registrations and sites in the Economic Program:	
July 17, 2012 (See the 2011 SOM, Table 5-4)	121
Table 5-5 Performance of PJM Economic Program participants	
excluding incentive payments: Calendar years 2002 through	
2011 and January through September 2012 (See the 2011 SOM,	
Table 5-5)	121
Table 5-6 PJM Economic Program participation by zone: January	
through September 2011 and 2012 (See the 2011 SOM,	
	122
Table 5-7 Settlement days submitted by month in the Economic	
Program: Calendar years 2007 through 2011 and January through	
September 2012	
(See the 2011 SOM, Table 5-7)	123

Table 5-8 Distinct customers and CSPs submitting settlements in	
the Economic Program by month: Calendar	
years 2008 through 2011 and January through September 2012	
(See the 2011 SOM, Table 5-8)	123
Table 5-9 Hourly frequency distribution of Economic Program	
MWh reductions and credits: January through September 2012	
(See the 2011 SOM, Table 5-9)	124
Table 5-10 Frequency distribution of Economic Program zonal,	
load-weighted, average LMP (By hours): January through	
September 2012 (See the 2011 SOM, Table 5-10)	125
Table 5-11 Zonal monthly capacity credits: January through	
September 2012 (See the 2011 SOM, Table 5-13)	126

### SECTION 6 Net Revenue

Table 6-1 Energy Market net revenue for a new entrant gas-fired CT under economic dispatch (Dollars per installed MW-year)	
(See the 2011 SOM, Table 6-3)	129
Table 6-2 PJM Energy Market net revenue for a new entrant	
gas-fired CC under economic dispatch (Dollars per installed	
MW-year) (See the 2011 SOM, Table 6-6)	130
Table 6-3 PJM Energy Market net revenue for a new entrant CP	
under economic dispatch (Dollars per installed MW-year)	
(See the 2011 SOM, Table 6-9)	130

# SECTION 7 Environmental and Renewable Energy Regulations

Table 7-1 RGGI CO <sub>2</sub> allowance auction prices and quantities:	
2009-2011 and 2012-2014 Compliance Periods (See 2011 SOM,	
Table 7-3)	136
Table 7-2 Renewable standards of PJM jurisdictions to 2022,	
(See 2011 SOM, Table 7-4)	138
Table 7-3 Solar renewable standards of PJM jurisdictions to 2022	
(See 2011 SOM Table 7-5)	138

Table 7-4 Renewable generation by jurisdiction and renewable	
resource type (GWh): January through September 2012	
(See 2011 SOM, Table 7-8)	139
Table 7-5 PJM renewable capacity by jurisdiction (MW), on	
September 30, 2012 (See 2011 SOM, Table 7-9)	140
Table 7-6 Renewable capacity by jurisdiction, non-PJM units	
registered in GATS <sup>,</sup> (MW), on September 30, 2012 (See 2011	
SOM, Table 7-10)	140
Table 7-7 $SO_2$ emission controls (FGD) by unit type (MW), as of	
September 30, 2012 (See 2011 SOM, Table 7-11)	141
Table 7-8 $NO_x$ emission controls by unit type (MW), as of	
September 30, 2012 (See 2011 SOM, Table 7-12)	141
Table 7-9 Particulate emission controls by unit type (MW), as of	
September 30, 2012 (See 2011 SOM, Table 7-13)	141
Table 7-10 Capacity factor of wind units in PJM, January through	
September 2012 (See 2011 SOM, Table 7-14)	142
Table 7-11 Wind resources in real time offering at a negative price	
in PJM, January through September 2012 (See 2011 SOM,	
Table 7–15)	142
Table 7-12 Capacity factor of wind units in PJM by month,	
2011 and 2012 (See 2011 SOM, Table 7-16)	143
SECTION 9 Interchange Transactions	

#### SECTION 8 Interchange Transactions

Table 8-1 Real-time scheduled net interchange volume by interface	
(GWh): January through September, 2012 (See 2011 SOM,	
Table 8-1)	148
Table 8-2 Real-time scheduled gross import volume by interface	
(GWh): January through September, 2012 (See 2011 SOM,	
Table 8-2)	148
Table 8-3 Real-time scheduled gross export volume by interface	
(GWh): January through September, 2012 (See 2011 SOM,	
Table 8–3)	149

Table 8-4 Real-time scheduled net interchange volume by interface pricing point (GWh): January through September, 2012 (See 2011 SOM, Table 8-4)	150	Table 8-15 Up-to Congestion scheduled gross export volume by interface pricing point (GWh): January through September, 2012 (New Table)	160
Table 8-5 Real-time scheduled gross import volume by interface pricing point (GWh): January through September, 2012 (See		Table 8-16 Active interfaces: January through September, 2012 (See 2011 SOM, Table 8-13)	161
2011 SOM, Table 8-5) Table 8-6 Real-time scheduled gross export volume by interface	151	Table 8-17 Active pricing points: January through September, 2012   (See 2011 SOM, Table 8-14)	161
pricing point (GWh): January through September, 2012 (See 2011 SOM, Table 8-6)	151	Table 8-18 Distribution of economic and uneconomic hourly flowsbetween PJM and MISO: January through September, 2012 (New	
Table 8-7 Day-Ahead scheduled net interchange volume by interface (GWh): January through September, 2012 (See 2011 SOM,		Table)   Table 8-19 Distribution of economic and uneconomic hourly flows	163
Table 8-7)Table 8-8 Day-Ahead scheduled gross import volume by interface	152	between PJM and NYISO: January through September, 2012 (New Table)	164
(GWh): January through September, 2012 (See 2011 SOM, Table 8-8)	153	Table 8-20 Con Edison and PSE&G wheeling agreement data: January through September, 2012 (See 2011 SOM, Table 8-15)	168
Table 8-9 Day-Ahead scheduled gross export volume by interface (GWh): January through September, 2012 (See 2011 SOM,		Table 8-21 Net scheduled and actual PJM flows by interface (GWh):January through September, 2012 (See 2011 SOM, Table 8-16)	169
Table 8-9) Table 8-10 Day-Ahead scheduled net interchange volume by	154	Table 8-22 Net scheduled and actual PJM flows by interface pricing point (GWh): January through September, 2012 (See 2011 SOM,	
interface pricing point (GWh): January through September, 2012 (See 2011 SOM, Table 8-10)	155	Table 8-17) Table 8-23 PJM and MISO TLR procedures: January, 2010 through	170
Table 8-11 Up-to Congestion scheduled net interchange volume by interface pricing point (GWh): January through September, 2012	133	September, 2012 (See 2011 SOM, Table 8-19) Table 8-24 Number of TLRs by TLR level by reliability coordinator:	171
(New Table)	156	January through September, 2012 (See 2011 SOM, Table 8-18)	171
Table 8-12 Day-Ahead scheduled gross import volume by interface pricing point (GWh): January through September, 2012 (See 2011		Table 8-25 Monthly volume of cleared and submitted up-to congestion bids: January, 2009 through September, 2012 (See	
SOM, Table 8-11) Table 8-13 Up-to Congestion scheduled gross import volume by	157	2011 SOM, Table 8-20) Table 8-26 Real-time average hourly LMP comparison for southeast,	173
interface pricing point (GWh): January through September, 2012 (New Table)	158	southwest, SouthIMP and SouthEXP interface pricing points: January through September, 2007 through 2012 (See 2011 SOM,	
Table 8-14 Day-Ahead scheduled gross export volume by interface pricing point (GWh): January through September, 2012 (See 2011		Table 8-21) Table 8-27 Real-time average hourly LMP comparison for Duke,	175
SOM, Table 8-12)	159	PEC and NCMPA: January through September, 2012 (See 2011 SOM, Table 8-22)	175
			.,,,

Table 8-28 Day-ahead average hourly LMP comparison for	
southeast, southwest, SouthIMP and SouthEXP Interface pricing	
points: January through September, 2007 through 2012 (See 2011	
SOM, Table 8-23)	177
Table 8-29 Day-ahead average hourly LMP comparison for Duke,	
PEC and NCMPA: January through September, 2012 (See 2011	
SOM, Table 8-24)	177
Table 8-30 Monthly uncollected congestion charges: Calendar years	
2010 and 2011 and January through September, 2012 (See 2011	
SOM, Table 8-25)	178
SECTION 9 Ancillary Service Markets	
Table 9-1 The Regulation Market results were not competitive	
(See 2011 SOM, Table 9-1)	181
Table 9-2 The Synchronized Reserve Markets results were	
competitive	
(See 2011 SOM, Table 9-2)	182
Table 9-3 The Day-Ahead Scheduling Reserve Market results were	
competitive (See 2011 SOM, Table 9-3)	182
Table 9-4 History of ancillary services costs per MW of Load:	
January through September, 2001 through 2012 (See 2011 SOM,	
Table 9-4)	183
Table 9-5 PJM regulation capability, daily offer and hourly eligible:	
January through September 2012 (See 2011 SOM, Table 9-5)	185
Table 9-6 Impact on PJM Regulation Market of currently regulating	
units scheduled to retire through 2015 (New Table)	185
Table 9-7 PJM Regulation Market required MW and ratio of eligible	
supply to requirement: January through September 2012 and	
2011 (See 2011 SOM, Table 9-6)	185
Table 9-8 PJM cleared regulation HHI: January through September	
2012 and 2011 (See 2011 SOM, Table 9-7)	186
Table 9-9 Regulation market monthly three pivotal supplier results:	
January through September 2010, 2011 and 2012 (See 2011	
SOM, Table 9-9)	186

Table 9-10 Regulation sources: spot market, self-scheduled, bilateral	
purchases: January through September 2012 (See 2011 SOM,	
	187
Table 9–11 PJM Regulation Market monthly weighted average	
market-clearing price, marginal unit opportunity cost and offer	
price (Dollars per MWh): January through September 2012	
	189
Table 9-12 Total regulation charges: January through September	105
	190
Table 9–13 Comparison of average price and cost for PJM	150
Regulation, January through September 2006 through 2012	
	190
Table 9–14 Synchronized Reserve Market required MW, RFC Zone	150
and Mid-Atlantic Subzone, December 2008 through September	
	191
Table 9–15 Synchronized Reserve market monthly three pivotal	
supplier results: January through September 2011 and 2012	
(See 2011 SOM,	
	193
Table 9–16 Average RFC SRMCP when all cleared synchronized	
reserve is DSR, average SRMCP, and percent of all cleared hours	
that all cleared synchronized reserve is DSR: January through	
	195
Table 9–17 Comparison of weighted average price and cost for PJM	
Synchronized Reserve, January through September, 2005	
	196
Table 9-18 Tier 1 bias used by PJM Dispatch January through	
	198
Table 9-19 Spinning Events, January 2009 through September	
	199
Table 9-20 PJM Day-Ahead Scheduling Reserve Market MW and	
clearing prices: January through September 2011 and 2012 (See	
	201

215

Table 9-21 Black start yearly zonal charges for network transmission use: January through September 2012 (See 2011 SOM, Table 9-22)	202	Table 10-10 Total PJM marginal loss costs by category (Dollars (Millions)): January through September, 2009 through 2012 (See 2011 SOM, Table 10-10)	208
SECTION 10 Congestion and Marginal Losses		Table 10-11 Total PJM marginal loss costs by market category (Dollars (Millions)): January through September, 2009 through	
Table 10-1 PJM real-time, load-weighted average LMP components		2012 (See 2011 SOM, Table 10-11)	209
(Dollars per MWh): January through September, 2009 through		Table 10-12 Monthly marginal loss costs by type (Dollars	200
2012 (See 2011 SOM, Table 10-1)	204	(Millions)): January through September, 2011 and 2012 (See	
Table 10-2 PJM day-ahead, load-weighted average LMP	204	2011 SOM, Table 10-12)	209
components (Dollars per MWh): January through September,		Table 10-13 Marginal loss credits (Dollars (Millions)): January	
2009 through 2012 (See 2011 SOM, Table 10-2)	204	through September, 2009 through 2012 (See 2011 SOM,	
Table 10-3 Zonal and PJM real-time, load-weighted average LMP	201	Table 10-13)	209
components (Dollars per MWh): January through September,		Table 10-14 Total PJM congestion (Dollars (Millions)): January	
2011 and 2012 (See 2011 SOM, Table 10-3)	205	through September for calendar years 2008 to 2012 (See 2011	
Table 10-4 Zonal and PJM day-ahead, load-weighted average LMP		SOM, Table 10-14)	211
components (Dollars per MWh): January through September,		Table 10-15 Total PJM congestion costs by category (Dollars	
2011 and 2012 (See 2011 SOM, Table 10-4)	206	(Millions)): January through September, 2011 and 2012 (See	
Table 10-5 Total PJM costs by component (Dollars (Millions)):		2011 SOM, Table 10-15)	212
January through September, 2009 through 2012 (See 2011 SOM,		Table 10-16 Total PJM congestion costs by market category	
Table 10-5)	207	(Dollars (Millions)): January through September, 2011 and 2012	
Table 10-6 Total PJM energy costs by category (Dollars (Millions)):		(See 2011 SOM, Table 10-16)	212
January through September, 2009 through 2012 (See 2011 SOM,		Table 10-17 Monthly PJM congestion costs (Dollars (Millions)):	
Table 10-6)	207	January through September 2012 (See 2011 SOM, Table 10-17)	212
Table 10-7 Total PJM energy costs by market category (Dollars		Table 10-18 Monthly PJM congestion costs (Dollars (Millions)):	
(Millions)): January through September, 2009 through 2012		January through September 2011 (See 2011 SOM, Table 10-18)	213
(See 2011 SOM, Table 10-7)	207	Table 10-19 Congestion summary (By facility type): January	214
Table 10-8 Monthly energy costs by type (Dollars (Millions)):		through September 2012 (See 2011 SOM, Table 10–19)	214
January through September, 2011 and 2012 (See 2011 SOM,		Table 10-20 Congestion summary (By facility type): January	214
Table 10-8)	207	through September 2011 (See 2011 SOM, Table 10-20) Table 10-21 Congestion Event Hours (Day Ahead against Real	214
Table 10-9 Total PJM Marginal Loss Costs (Dollars (Millions)):		Time): January through September 2011 and 2012 (See 2011	
January through September, 2009 through 2012 (See 2011	208	SOM, Table 10-21)	215
SOM, Table 10-9)	200	Table 10-22 Congestion Event Hours (Real Time against Day	213
		Ahead): January through September 2011 and 2012 (See 2011	

SOM, Table 10-22)

Table 10-23 Congestion summary (By facility voltage): January	
through September 2012 (See 2011 SOM, Table 10-23)	216
Table 10-24 Congestion summary (By facility voltage): January	
through September 2011 (See 2011 SOM, Table 10-24)	216
Table 10-25 Top 25 constraints with frequent occurrence: January	
through September 2011 and 2012 (See 2011 SOM, Table 10-25)	217
Table 10-26 Top 25 constraints with largest year-to-year change in	
occurrence: January through September 2011 and 2012 (See	
2011 SOM, Table 10-26)	218
Table 10-27 Top 25 constraints affecting PJM congestion costs	
(By facility): January through September 2012 (See 2011 SOM,	
Table 10-27)	219
Table 10-28 Top 25 constraints affecting PJM congestion costs	
(By facility): January through September 2011 (See 2011 SOM,	
Table 10–28)	220
Table 10-29 Top congestion cost impacts from MISO flowgates	
affecting PJM dispatch (By facility): January through September	
2012 (See 2011 SOM, Table 10-29)	222
Table 10-30 Top congestion cost impacts from MISO flowgates	
affecting PJM dispatch (By facility): January through September	
2011 (See 2011 SOM, Table 10-30)	223
Table 10-31 Regional constraints summary (By facility): January	
through September 2012 (See 2011 SOM, Table 10-31)	224
Table 10-32 Regional constraints summary (By facility): January	
through September 2011 (See 2011 SOM, Table 10-32)	224
SECTION 11 Generation and Transmission Planning	
Section in Generation and Hanshission Hanning	

Table 11-1 Year-to-year capacity additions from PJM generation	
queue: Calendar years 2000 through September 30, 2012	
(See 2011 SOM, Table 11-1)	225
Table 11-2 Queue comparison (MW): September 30, 2012 vs.	
December 31, 2011 (See 2011 SOM, Table 11-3)	226
Table 11-3 Capacity in PJM queues (MW): At September 30, 2012	
(See 2011 SOM, Table 11-4)	226

Table 11-4 Average project queue times (days): At Septe	ember 30,
2012 (See 2011 SOM, Table 11-5)	227
Table 11-5 Active capacity queued to be in service prior	• to
October 1, 2012 (New table)	227
Table 11-6 Capacity additions in active or under-constr	uction
queues by control zone (MW): At September 30, 2012	2 (See 2011
SOM, Table 11-6)	228
Table 11-7 Capacity additions in active or under-constr	uction
queues by LDA (MW): At September 30, 2012 (See 20	011 SOM,
Table 11–7)	228
Table 11-8 Existing PJM capacity: At September 30, 20	12 (By
zone and unit type (MW)) (See 2011 SOM, Table 11-8	3) 229
Table 11-9 PJM capacity (MW) by age: at September 30	, 2012
(See 2011 SOM Table 11-9)	229
Table 11-10 Comparison of generators 40 years and old	er with
slated capacity additions (MW): Through 2018 (See 2	011 SOM,
Table 11–10)	230
Table 11-11 Summary of PJM unit retirements (MW): C	
year 2011 through 2019 (See 2011 SOM, Table 11-11	
Table 11-12 Planned deactivations of PJM units in caler	e
2012 as of October 1, 2012 (See 2011 SOM, Table 11	
Table 11-13 Planned deactivations of PJM units after ca	
year 2012, as of October 1, 2012 (See 2011 SOM, Tak	ole 11-13) 232
Table 11-14 HEDD Units in PJM as of October 1, 2012	
(See 2011 SOM, Table 11-14)	232
Table 11-15 Unit deactivations: January through Octobe	
(See 2011 SOM, Table 11-15)	233

# SECTION 12 Financial Transmission and Auction Revenue Rights

Table 12-1 The FTR Auction Markets results were competitive	
(See 2011 SOM, Table 12-1)	235

Table 12-2 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through September 2012 (See 2011 SOM, Table 12-6) Table 12-3 Daily FTR net position ownership by FTR direction:	238	<ul><li>Table 12-14 Residual ARR allocation volume and target allocation (New Table)</li><li>Table 12-15 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2011, through</li></ul>	253
January through September 2012 (See 2011 SOM, Table 12-7) Table 12-4 Monthly Balance of Planning Period FTR Auction market	239	September 30, 2012 (See 2011 SOM, Table 12-29) Table 12-16 ARR revenue adequacy (Dollars (Millions)): Planning	254
volume: January through September 2012 (See 2011 SOM, Table 12-11)	240	periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM, Table 12-33)	254
Table 12-11   Table 12-5 Monthly Balance of Planning Period FTR Auction	240	Table 12-17 ARR and self-scheduled FTR congestion offset	231
buy-bid, bid and cleared volume (MW per period): January	~ · · ·	(in millions) by control zone: Planning period 2012 to 2013	256
through September 2012 (See 2011 SOM, Table 12-12) Table 12-6 Secondary bilateral FTR market volume: Planning periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM,	241	through September 30, 2012 (See 2011 SOM, Table 12-34) Table 12-18 ARR and FTR congestion offset (in millions) by control zone: Planning period 2012 to 2013 through	256
Table 12-13)	242	September 30, 2012 (See 2011 SOM, Table 12-35)	257
Table 12-7 Monthly Balance of Planning Period FTR Auction		Table 12-19 ARR and FTR congestion hedging (in millions): Planning periods 2011 to 2012 and 2012 to 2013 through	
cleared, weighted-average, buy-bid price per period (Dollars per MW): January through September 2012 (See 2011 SOM,		September 30, 2012 (See 2011 SOM, Table 12-36)	257
Table 12-16)	244		
Table 12-8 Monthly Balance of Planning Period FTR Auction revenue: January through September 2012 (See 2011 SOM,			
Table 12–20)	245		
Table 12-9 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM, Table 12-21)	248		
Table 12-10 Monthly FTR accounting summary (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013	240		
(See 2011 SOM, Table 12-22)	248		
Table 12-11 FTR payout ratio by planning period (See 2011 SOM, Table 12-23)	249		
Table 12-12 FTR profits by organization type and FTR direction:	249		
January through September 2012 (See 2011 SOM, Table 12-24)	251		
Table 12-13 Monthly FTR profits by organization type: Januarythrough September 2012 (See 2011 SOM, Table 12-25)	252		

2012 Quarterly State of the Market Report for PJM: January through September