APPENDIX 3

DE IRP Demand Forecast Documentation

PHI Economics and Forecasting Group

I. Introduction

A. Purpose of This Document

This document explains the process used by Delmarva Power and Light Company (DPL) in preparing the projections of electric energy and power demand submitted as part of the Company's Integrated Resource Plan in Delaware. The purpose is to make those projections transparent, so that any interested reviewer will be able to clearly understand the procedures that were used. Throughout these discussions of forecasting, the goal is to build a consensus that the results are "not unreasonable."

The remainder of this chapter provides a discussion of business forecasting, focused on how business forecasting practices may differ from textbook treatments. The chapter then continues with an overview of how the models used in preparing these projections are constructed, and concludes with a discussion of forecast accuracy.

Chapter II discusses the data considerations that influence or limit the range of forecasting techniques available. It also discusses the most important assumptions that are used in the projections.

Chapter III discusses the opportunities for energy efficiency and conservation that properly should be recognized in the projections. While the improvements in energy efficiency may not be controversial, the techniques that may be used in incorporating improvements into the forecast are always open to interpretation. In this forecast, the expected improvements in future efficiency are expressed in the form of programmatic goals. Since few of these programs have existed in the past, there is little history that can be directly incorporated into the forecast. The Company has frequently referred to this technique as accounting for programmatic goals "below the line," with expected programmatic results subtracted from the forecast.

Chapter IV presents the DPL Baseline forecasts for the Delmarva Zone in the PJM transmission area. This forecast has been prepared by the Company independent of the forecast published by PJM in their PJM Annual Load Report. Chapter V reports the projections of energy requirements and power demands by class of customers.

B. Brief Overview of Business Forecasting

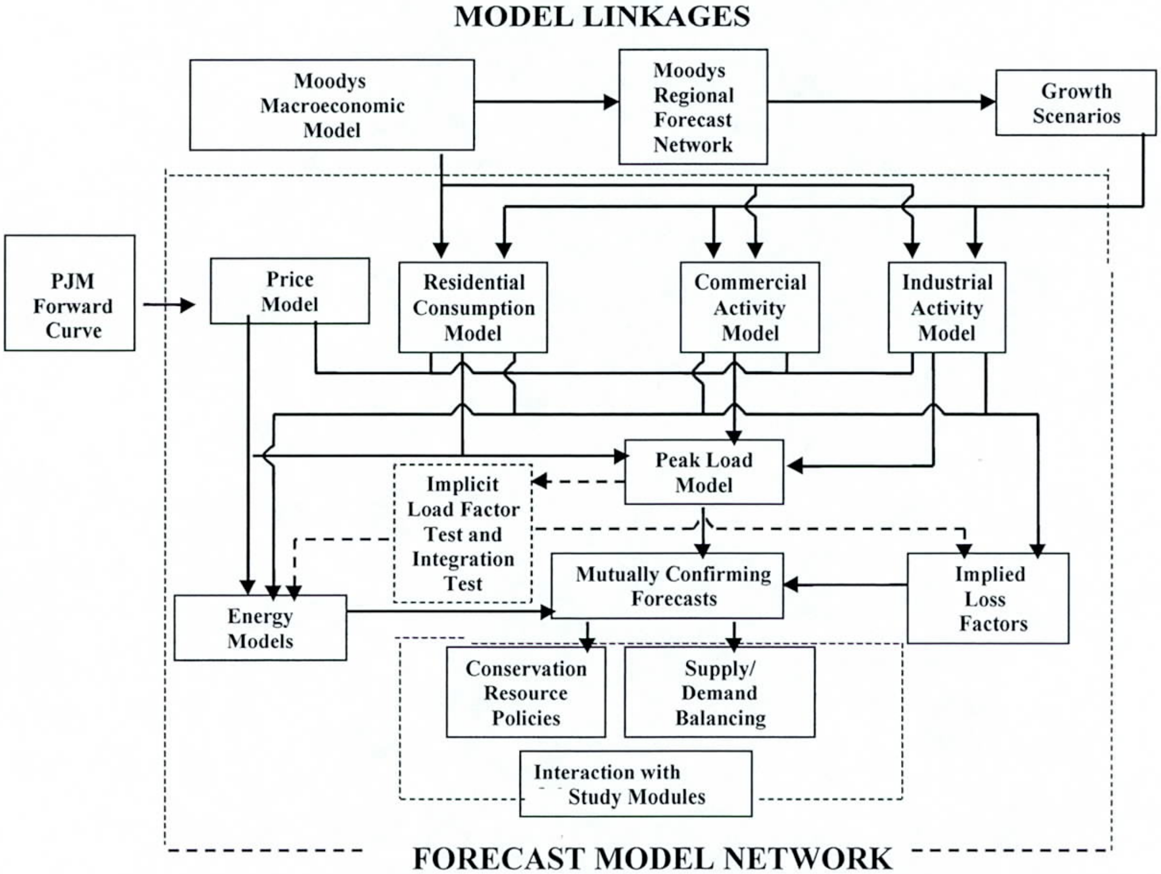
At the most basic level, business forecasts must serve the planning needs of the business in an independent, informed and objective manner. At the same time, forecasting is an economic activity. A more involved, more complicated, more expensive forecast is only worthwhile if it creates more value for the business. In many cases smaller, simpler, more straightforward forecasts provide reasonable results. Of course, the most important component in any forecast is the good judgment and expertise of the team of forecasters.

The approach used at DPL includes the concept of mutually confirming forecasts. Wherever possible, independently prepared forecasts are used to provide support of the forecast. For example, in preparing the outlook for the Delmarva Zone, independent forecasts of retail sales, the amount of energy throughput for the zone and the peak demand for the zone are prepared. It is expected that forecasts of the load and throughput will provide a consistent view of the future. The reasonableness of the independent components of the forecast raises DPL's confidence in the forecast.

C. Modeling/Forecasting Philosophy

Figure 1 presents the DPL Load Forecast Model in outline form. The forecast uses economic forecasts prepared by an outside vendor, Moodys Economy.com (Moodys). The DPL baseline forecast that is the basis for the Company's IRP submission (which is also the Company's 2010 Budget and Planning Forecast) is based upon the Moodys outlook that was current in December 2009. The key economic variables that are drawn from the Moodys outlook include local employment, local incomes and the rate of inflation.

Figure 1
The DPL Load Forecast Model Network



Other exogenous factors include the commodity component of the price of electricity, which is taken as the PJM Forward Curve as posted by the New York Mercantile Exchange (NYMEX). The total all-in retail end-use price of electricity, inclusive of taxes, surcharges and the commodity cost of electricity is calculated using a deterministic spreadsheet model that replicates the Company's supply portfolio. We expect estimated price elasticities to fall within a reasonable range consistent with our expectations given economic theory and industry consensus.

Forecast Scenarios

The forecasting system is designed to support multiple scenarios, relying on either alternative Moodys scenarios or scenarios constructed by the Company, consistent with the requirements of Section 4.0 of the Delmarva

Power IRP Rules and Regulations. The Company's IRP includes a Baseline Scenario, a High Economic Scenario, a Low Economic Scenario and an Extreme Weather Scenario.

The probability of each scenario is always determined subjectively. The Baseline Scenario is intended to be as equally likely too high as too low. This is often called a 50:50 Scenario. It is based upon an economic forecast that Moodys also characterizes as a forecast that is intended to be as equally likely high as low.

The High Scenario is based upon a Moodys economic outlook scenario that they estimate has a 20% chance of being exceeded by a higher economic outcome. The Low Scenario is built in a similar fashion. DPL has used the same projections of the weather and the price of electricity in both the High and Low Scenarios.

The Extreme Weather Scenario uses the Moodys Baseline Economic Outlook combined with weather that is projected as being two standard deviations more extreme than normal, i.e., heating and cooling degree days are calculated as their normal value plus two standard deviations.

Forecast Construction

The core of the forecast is supported by the Residential, Commercial and Industrial Retail Sales Forecasts. These models are driven by local employment, local income, electricity prices and seasonal factors. The weather is especially important in determining sales to Residential and Commercial customers. Weather is measured at the New Castle County Regional Airport (frequently referred to as the "Wilmington airport") by the National Oceanic and Atmospheric Administration (NOAA). The Company maintains a comprehensive database of weather metrics, but the measures used most frequently are dry bulb temperature, heating degree days and cooling degree days, both measured on a comfort threshold of 65 degrees Fahrenheit.

The key output of the retail sales forecasting model is Calendar Retail Sales, the total sales to the Company's DPL Delaware customers, expressed on a calendar month basis.

Finally, the peak hour demand for the Delmarva Zone is calculated in a separate and independent forecast. The linear regression equation report for this peak hour demand relationship is presented in Appendix B. Linear regression is a statistical estimation technique that is commonly used by forecasters to establish quantitative relationships between a concept of interest (such as zonal demand) and its determinants (such as employment, incomes, prices and weather). Regression allows for the estimation of forecasting equations that serve as a useful shorthand in looking at all of the possible inter-relationships.

After all of the components of the forecast are complete, the components are compared side by side to insure that they combine to provide a consistent view of the future.

Construction of the IRP Projections

The projections of demand to rate classes (residential, small commercial, large commercial and industrial, and street lighting) within the Company's Delaware retail jurisdiction are calculated based upon the shares represented by those rate classes at the time of the Delmarva Zone peak demand (non-coincident with the PJM peak demand) at 3:00 PM, August 21, 2009. This information, as recorded by the Company's Market Settlements Group in their LODESTAR database, is presented in Appendix C.

Projections of energy by rate class are constrained to be consistent with forecasts of energy by revenue class in the 2010 Budget and Planning Forecast. Projections of demand and energies by category were allocated to these classes according to the class contribution to the peak demand, as described above.

Projections of demand and energies were allocated to Standard Offer Service and Choice customers based upon the percentage of customers purchasing each product by rate class as of July 2009.

Forecast Accuracy

Figures 2 and 3, below, illustrate the DPL forecast track record on the subject of summer peak demand. As can be seen in Figures 2 and 3, the actual history of peak demand (the solid black line) generally cuts through the approximate middle of the forecasts.

Figure 2
DP&L Demand Forecasts, 1987-1998

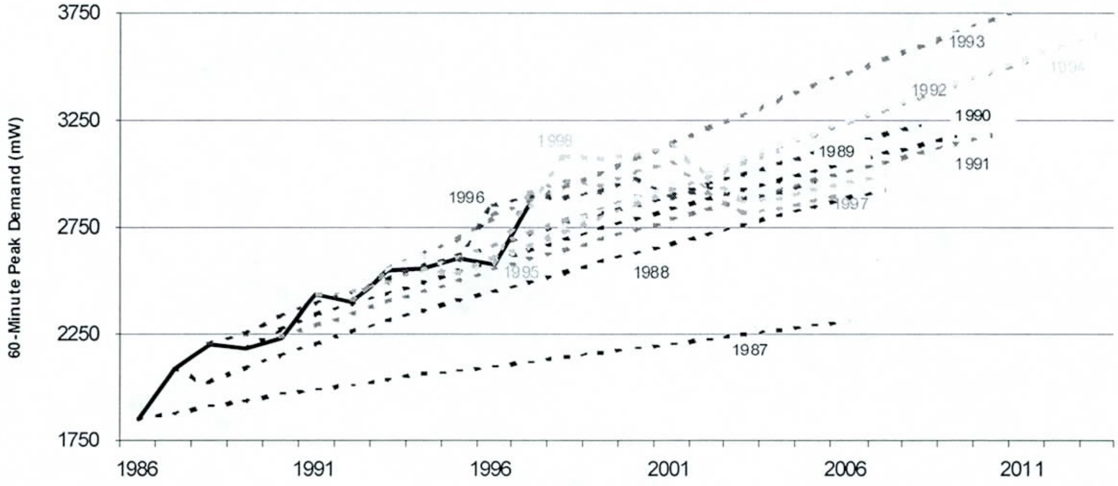
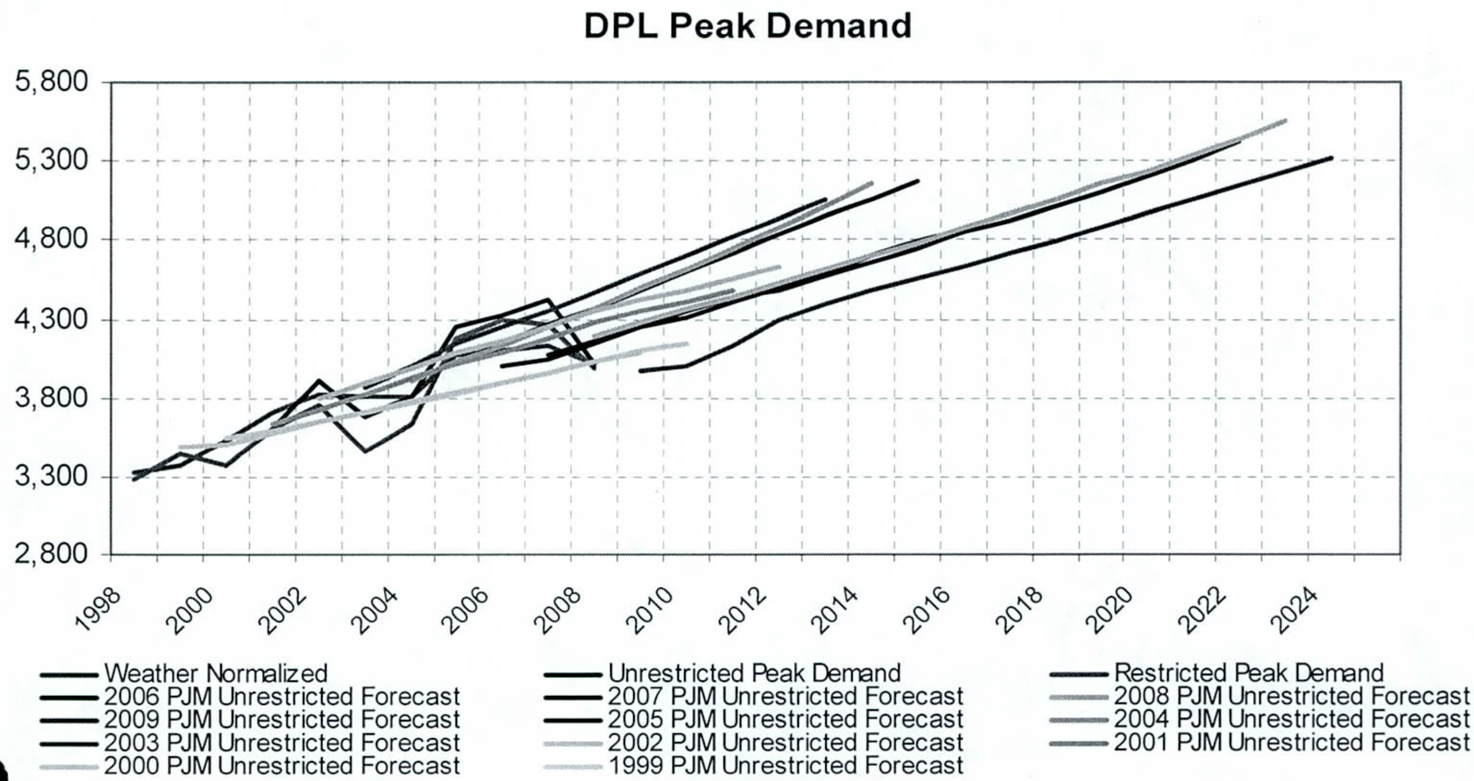


Figure 3 illustrates the peak demand forecasts prepared in 1998 and later. These data are taken from the PJM publication titled Annual Load Report, and available on their website. For the period 2006 through current the forecasts were prepared by PJM's forecasting staff. Prior to 2006 the forecasts were prepared by the Company and submitted to PJM for collation and publication.

Figure 3



DPL's interpretation of forecast accuracy is that there are two considerations. First, forecasts should be unbiased, in the sense that errors should be expected to be zero at the time the forecast is made. Second, forecasts should be risk minimizing, in the sense that the confidence bands around the forecast should be as small as possible.

Forecast risk should be measured as the standard error of the forecast, although that concept is difficult to calculate. In fact, it can not be calculated directly, although it can be shown that the standard error of the forecast is a function of the standard error of the regression, the number of variables in the regression equation and the distance from the historic mean of the variable being explained.

As shown in Appendix B, the standard error of the regression for the regression relationship used to forecast the peak hour demand in the Delmarva Zone is 218 MW, with a historic average peak demand of 2,755 MW. In other words if the relationship was used to predict the peak hour demand at the mean of the historic data, 95% confidence bands surrounding the forecast would be +/-218*2 or +/-436 MW wide. In other words, the width of the confidence interval is roughly 16% of the underlying series, calculated at the mean of the historical value (which also happens to be its minimum value).

The relationship between the number of explanatory variables and the standard error of the forecast leads to a Principle of Parsimony, that argues that each variable included in the equation must pay its way by way of explanation, because it presents another source of risk to the forecast. The fact that the standard error of the forecast increases as one moves away from the mean of the historical data gives rise to the observation that confidence bands are "trumpet shaped," i.e., the standard error of the forecast gets bigger as the forecast tries to look farther out into the future.

The forecasts presented in Figure 3 are also presented in Table 1. Once again, these data are drawn from PJM's Annual Load Reports. Table 1 illustrates the errors (the difference between expected loads and actual observed loads) for 1-year forecasts, 2-year forecasts, and so on out to 8-year forecasts. Beyond eight years there are not enough data points to estimate a standard error.

Table 1
Zonal Peak Demand Forecast Accuracy

DPL Zone	1-Year	2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year
2009 PJM Unrestricted Forecast	129							
2008 PJM Unrestricted Forecast	183	435						
2007 PJM Unrestricted Forecast	(346)	157	413					
2006 PJM Unrestricted Forecast	(334)	(382)	141	401				
2005 PJM Unrestricted Forecast	(218)	(185)	(165)	363	644			
2004 PJM Unrestricted Forecast	100	(222)	(191)	(170)	363	652		
2003 PJM Unrestricted Forecast	183	184	(104)	(80)	(68)	461	743	
2002 PJM Unrestricted Forecast	(113)	214	174	(160)	(162)	(170)	344	578
2001 PJM Unrestricted Forecast	21	(178)	148	106	(230)	(234)	(243)	269
2000 PJM Unrestricted Forecast	173	(14)	(252)	31	(51)	(420)	(437)	(460)
1999 PJM Unrestricted Forecast	51	131	(34)	(261)	33	(40)	(408)	(430)
Mean Error	-15.55	14.00	14.44	28.75	75.57	41.50	-0.20	-10.75
Standard Error	203.84	251.67	217.93	247.03	314.64	421.65	521.26	517.20

Based upon our experience, DPL believes that these data are representative of the results that would be reported for other similar forecasts. It has been DPL's experience that, in general, utility forecasts are usually unbiased. It has also been DPL's experience that the risk associated with demand forecasts is much higher than most readers of forecasts expect – the future can only be known with great uncertainty. Finally, it has been DPL's observation that the risk associated with the forecast, or the standard error of the forecast, grows slowly at first as the time horizon of the forecast is extended, but eventually begins to expand at an increasing rate and quickly become very large.

II. Assumptions and Data Considerations

DPL prepares its forecasts for DPL DE and the Delmarva zone utilizing an integrated econometric sales and load modeling network. The forecasting approach relies heavily on the preparation of forecasts for key concepts that are prepared independently, with the expectation that mutually confirming results should raise the confidence that can be placed in the forecast. Appendix A contains a data base dictionary for the concepts used in our demand models. Estimated forecasting equations for demand and system throughput are included in Appendix B.

The forecasting model uses monthly data that in most cases goes back to 1991. 1991 was chosen because there have been two complete business cycles since 1991, and it seems like there has been structural change in our local economies since the 1980s.
The weather data that is used in preparing the forecast for DPL DE is collected and reported by NOAA, reflecting conditions at the New Castle County Regional Airport. DPL maintains hourly weather data back to 1964, and constructs all of the weather metrics that are used in forecasting from this raw data. For most scenarios, the forecasts of the weather metrics are their normal, or average, values taken over a rolling 30-year period. For the extreme weather scenario, the normal weather values are defined as their 30-year normal values plus two standard deviations.

Projections of economic and demographic activity in the local economy are purchased from Moodys Economy.com (MEDC). MEDC updates its forecast products monthly, usually during the third week of the month. MEDC provides high and low scenarios for economic activity, as discussed above.

Projections of the price of electricity are based upon a deterministic spreadsheet model of the Company's supply portfolio. It is believed that the household makes rational electricity consumption decisions based upon the all-in real cost of electricity, inclusive of all taxes, surcharges, and the commodity component of the electricity price. Since we do not have data on the commodity cost of electricity for choice customers, we assume their commodity costs are the same as for the Standard Offer Service (SOS) customers. It is assumed that costs, taxes and surcharges associated with the wires business will increase with general inflation. It is assumed that the price of the commodity component will escalate with the PJM forward curve, as posted on the NYMEX.

III. Incorporation of Opportunities For Demand Side Management.

The historical data pertaining to electricity sales in the DPL DE jurisdiction is not influenced by any significant recent demand side management programs. DPL believes that conservation has taken place, and that conservation is reflected in the data, but that conservation has not been the result of programmatic objectives.

Conservation has been of two forms. First, some conservation is price motivated, although it can go in either direction. The real price of electricity delivered to the consumer fell between 1992 and 2005, and electricity usage expanded. After 2005 real prices rose, and usage has contracted, revealing a long term price elasticity that we calculate to be about 0.1. During this long period DPL has also found that the peak demand is also sensitive to the real price of electricity, with an estimated price elasticity of about 0.2. In the forecast period it is expected that electricity prices will remain flat in real terms.

Second, conservation can be ethically motivated. It is hard to distinguish between ethically motivated and price motivated conservation. The recent historical data, however, fits well with the idea that most conservation has been price motivated.

In Delaware, the Company will be working collaboratively with the SEU to assist in achieving additional conservation or energy efficiencies as directed in the Delaware Energy Efficiency Act of 2009 through the implementation of specific SEU programs. In adjusting the forecast to account for the inclusion of programmatic goals, the Company will subtract the amount of the goal achieved from the Baseline forecast “below the line.” The resulting forecast will be referred to as the “Reference Forecast.”

IV. The Load Forecast

Tables 2 through 5 describe the baseline energy throughput and power demand forecast for the Delmarva Zone, through January 2010.

Table 2 presents the outlook for energy throughput in the Company's Delaware retail jurisdiction. Weather conditions (heating and cooling degree days) are reported in the Wilmington HDD and CDD columns. The next column contains Gross Retail Output or the amount of energy the Company must provide the system before losses to serve the needs of its retail customers. Finally, the Calendar Month Retail Sales column contains annual energy on a Calendar Month basis.

Table 2
DPL Delaware Energy Throughput

	Wilmington HDD	Wilmington CDD	Gross Retail Output (gWh)	Growth (%)	Calendar Month Retail Sales (gWh)	Growth (%)
2001						
2002	4,475	1,300	9,951		9,452	
2003	5,229	1,003	9,909	-0.4%	9,313	-1.5%
2004	4,911	1,034	9,502	-4.1%	9,014	-3.2%
2005	4,946	1,286	9,676	1.8%	9,233	2.4%
2006	4,372	1,135	9,266	-4.2%	8,709	-5.7%
2007	4,619	1,369	9,485	2.4%	8,856	1.7%
2008	4,590	1,170	9,123	-3.8%	8,767	-1.0%
2009	4,760	988	8,895	-2.5%	8,399	-4.2%
2010	4,829	1,131	9,047	1.7%	8,392	-0.1%
2011	4,829	1,131	9,066	0.2%	8,410	0.2%
2012	4,829	1,131	9,140	0.8%	8,483	0.9%
2013	4,829	1,131	9,211	0.8%	8,553	0.8%
2014	4,829	1,131	9,249	0.4%	8,621	0.8%
2015	4,829	1,131	9,273	0.3%	8,676	0.6%
2016	4,829	1,131	9,296	0.3%	8,746	0.8%
2017	4,829	1,131	9,323	0.3%	8,802	0.6%
2018	4,829	1,131	9,349	0.3%	8,864	0.7%
2019	4,829	1,131	9,375	0.3%	8,923	0.7%
2020	4,829	1,131	9,405	0.3%	8,998	0.8%
2021	4,829	1,131	9,436	0.3%	9,056	0.6%
2022	4,829	1,131	9,466	0.3%	9,123	0.7%
2023	4,829	1,131	9,498	0.3%	9,190	0.7%
2024	4,829	1,131	9,529	0.3%	9,266	0.8%
2025	4,829	1,131	9,560	0.3%	9,325	0.6%

Table 3 presents how the energy forecast appears after it is rolled up to the Delmarva zone. Net Sendout is the amount of energy that must be available to the zone in order to serve the needs of all consumers within the zone. Net Sendout is roughly equivalent to the PJM concept Net Energy for Load, except that Net Energy for Load includes the allocated losses from the shared 500 kV transmission system. Once again, it is expected that implied shares and losses will fall within a reasonable range.

Table 3
Delmarva Zone Energy Throughput

	Wilmington HDD	Wilmington CDD	Net Sendout (gWh)	(%)	Gross Retail Output (gWh)	Growth (%)	Calendar Month Retail Sales (gWh)	Growth (%)
2001			16,626					
2002	4,475	1,300	18,709	12.5%	9,951		9,452	
2003	5,229	1,003	19,071	1.9%	9,909	-0.4%	9,313	-1.5%
2004	4,911	1,034	19,230	0.8%	9,502	-4.1%	9,014	-3.2%
2005	4,946	1,286	19,886	3.4%	9,676	1.8%	9,233	2.4%
2006	4,372	1,135	18,961	-4.7%	9,266	-4.2%	8,709	-5.7%
2007	4,619	1,369	19,576	3.2%	9,485	2.4%	8,856	1.7%
2008	4,590	1,170	18,985	-3.0%	9,123	-3.8%	8,767	-1.0%
2009	4,760	988	18,712	-1.4%	8,895	-2.5%	8,399	-4.2%
2010	4,829	1,131	18,355	-1.9%	9,047	1.7%	8,392	-0.1%
2011	4,829	1,131	18,415	0.3%	9,066	0.2%	8,410	0.2%
2012	4,829	1,131	18,601	1.0%	9,140	0.8%	8,483	0.9%
2013	4,829	1,131	18,781	1.0%	9,211	0.8%	8,553	0.8%
2014	4,829	1,131	18,882	0.5%	9,249	0.4%	8,621	0.8%
2015	4,829	1,131	18,945	0.3%	9,273	0.3%	8,676	0.6%
2016	4,829	1,131	19,004	0.3%	9,296	0.3%	8,746	0.8%
2017	4,829	1,131	19,072	0.4%	9,323	0.3%	8,802	0.6%
2018	4,829	1,131	19,140	0.4%	9,349	0.3%	8,864	0.7%
2019	4,829	1,131	19,206	0.3%	9,375	0.3%	8,923	0.7%
2020	4,829	1,131	19,283	0.4%	9,405	0.3%	8,998	0.8%
2021	4,829	1,131	19,361	0.4%	9,436	0.3%	9,056	0.6%
2022	4,829	1,131	19,440	0.4%	9,466	0.3%	9,123	0.7%
2023	4,829	1,131	19,521	0.4%	9,498	0.3%	9,190	0.7%
2024	4,829	1,131	19,602	0.4%	9,529	0.3%	9,266	0.8%
2025	4,829	1,131	19,682	0.4%	9,560	0.3%	9,325	0.6%

As shown in Table 4, the 2009 actual summer peak demand on the Delmarva Zone was 3,843 MW on August 21, 2009 at 3:00 PM. At the time of the peak demand there were 13 observed cooling degrees, as the ambient dry bulb temperature was 78 degrees Fahrenheit. The official weather normalized demand in the Delmarva Zone for the summer of 2009 was 3,960 MW.

Table 4
Delmarva Zone Metered Summer Peak Demand

DPL					
				WN	
			Metered	Metered	
			Non-	Non-	
	Peak	WLM	Coincident	Coincident	Growth
	Date & Hour	MWCD	(MW)	(MW)	(%)
2001	8/9/01 3:00 PM	34	3,611	3,537	
2002	7/29/02 4:00 PM	31	3,758	3,680	4.0%
2003	8/22/03 5:00 PM	23	3,670	3,801	3.3%
2004	8/20/04 4:00 PM	21	3,636	3,805	0.1%
2005	7/27/05 5:00 PM	29	4,174	4,010	5.4%
2006	8/3/06 5:00 PM	29	4,288	4,060	1.3%
2007	8/8/07 5:00 PM	30	4,178	3,973	-2.2%
2008	6/10/08 5:00 PM	27	3,971	3,986	0.3%
2009	8/21/09 3:00 PM	13	3,843	3,960	-0.6%
2010		26		3,905	-1.4%
2011		26		3,876	-0.7%
2012		26		3,746	-3.4%
2013		26		3,776	0.8%
2014		26		3,846	1.9%
2015		26		3,940	2.4%
2016		26		4,031	2.3%
2017		26		4,124	2.3%
2018		26		4,197	1.8%
2019		26		4,276	1.9%
2020		26		4,345	1.6%
2021		26		4,411	1.5%
2022		26		4,473	1.4%
2023		26		4,538	1.4%
2024		26		4,600	1.4%
2025		26		4,658	1.3%

Figure 4, below, presents the Company's forecast for the unrestricted summer peak demand for DPL DE jurisdiction within the Delmarva Zone, including all of the scenarios. The heavy green line is the Baseline Scenario; it is assumed that 50% of the possible future outcomes will be above this line and 50% will be below. The red and blue lines are the High and Low, respectively, Economic Scenarios. It is assumed that 10% of the possible outcomes will lie above the red line, and 10% will lie below the blue line. Finally, the purple line represents the Extreme Weather Scenario. Extreme Weather is represented by calculating the average and standard deviation of heating and cooling degree days for each month of the year. In the forecast, monthly heating and cooling degree days are set equal to their historical average plus two standard deviations.

Figure 4
DPL Delaware Jurisdictional Summer Peak Demand (MW)

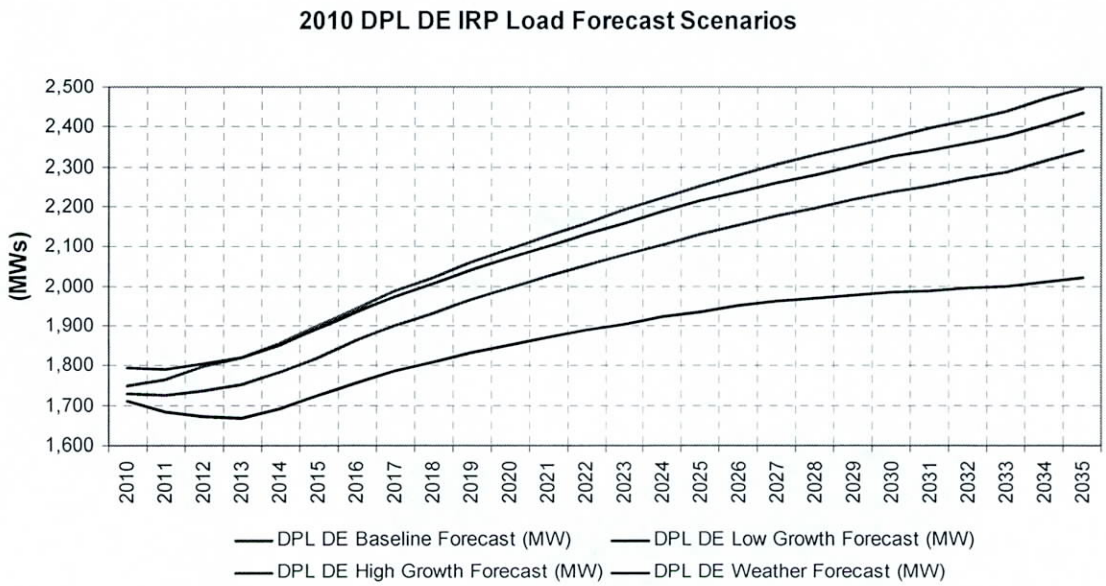


Figure 5 (below) illustrates energy throughput for the DPL DE jurisdiction within the Delmarva Zone, the amount of annual energy required to serve all DPL DE customers, inclusive of all losses and self-use, for these same four scenarios.

Figure 5
DPL DE Jurisdictional Energy Throughput
(MWh)

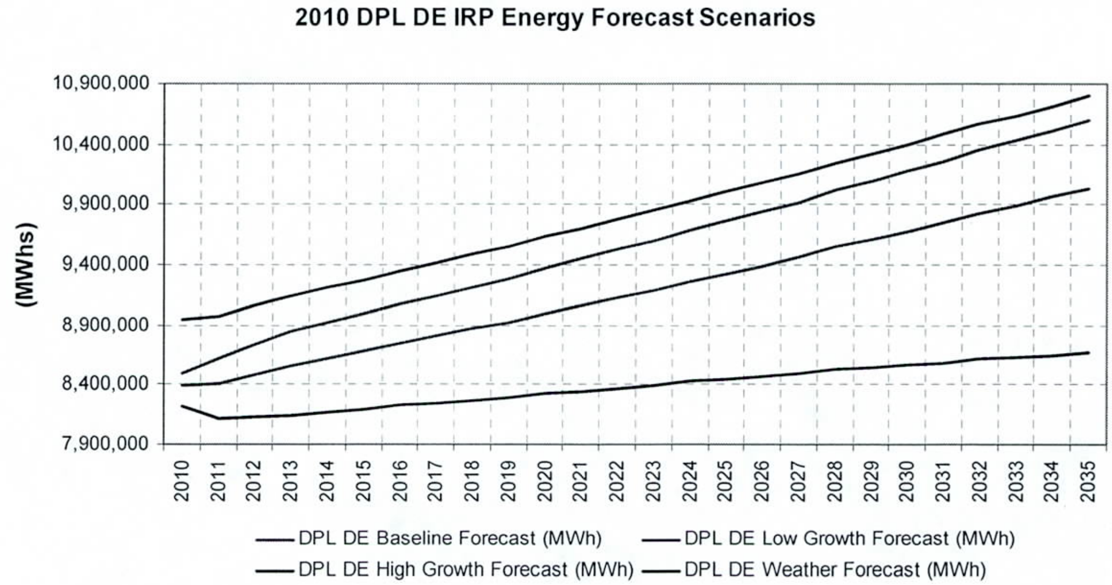


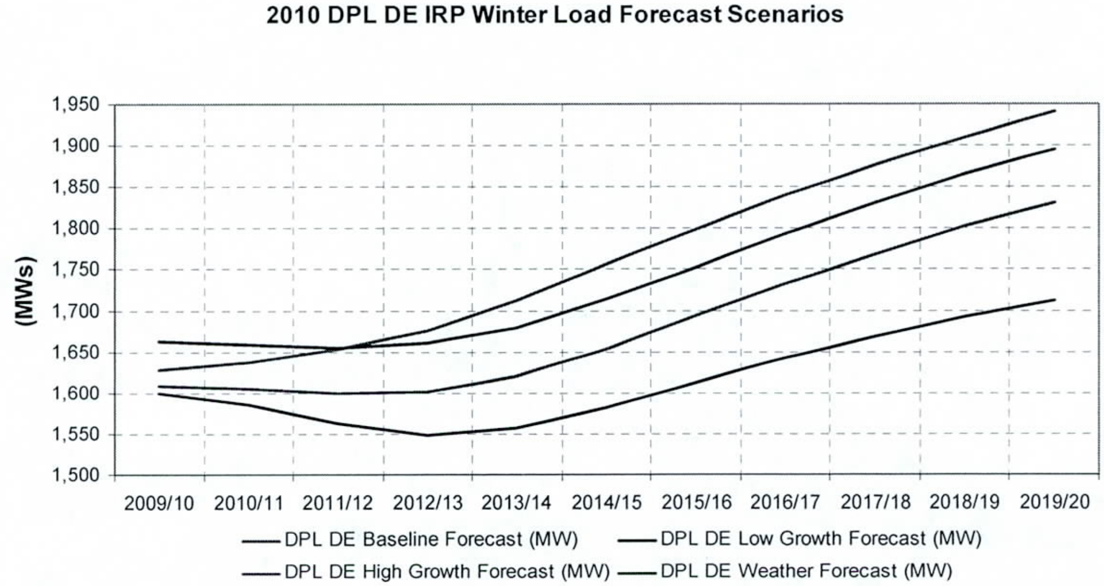
Table 5 provides winter peak demand information for the Delmarva Zone. For the 2009/10 winter heating season, the actual zone peak of 3,313 MW occurred on January, 30 2010 at 7:00 PM. Our preliminary calculations indicate a weather normalized winter load of 3,228 MW.

Table 5
Delmarva Zone Metered Winter Peak Demand

DPL					
	Peak Date & Hour	WLM MWHD	Metered Non-Coincident (MW)	WN Metered Non-Coincident (MW)	Growth (%)
2000/01	12/28/00 7:00 PM	41	2,917	2,974	
2001/02	2/5/02 8:00 AM	46	2,875	2,892	-2.8%
2002/03	1/24/03 8:00 AM	53	3,413	3,083	6.6%
2003/04	1/16/04 8:00 AM	55	3,398	3,122	1.3%
2004/05	1/28/05 8:00 AM	64	3,486	3,240	3.8%
2005/06	12/14/05 7:00 PM	43	3,180	3,146	-2.9%
2006/07	2/6/07 8:00 AM	55	3,603	3,360	6.8%
2007/08	2/11/08 8:00 AM	52	3,228	3,310	-1.5%
2008/09	1/16/09 7:00 PM	52	3,483	3,310	0.0%
2009/10	1/30/10 7:00 PM	47	3,313	3,228	-2.5%
2010/11		50		3,545	9.8%
2011/12		50		3,535	-0.3%
2012/13		50		3,540	0.1%
2013/14		50		3,579	1.1%
2014/15		50		3,653	2.0%
2015/16		50		3,741	2.4%
2016/17		50		3,827	2.3%
2017/18		50		3,907	2.1%
2018/19		50		3,982	1.9%
2019/20		50		4,045	1.6%
2020/21		50		4,106	1.5%
2021/22		50		4,163	1.4%
2022/23		50		4,221	1.4%
2023/24		50		4,276	1.3%
2024/25		50		4,329	1.2%

Finally, Figure 6 displays the DPL DE unrestricted winter peak forecast for each of the scenarios. These scenarios are identical to the ones provided in Figure 4.

Figure 6
DPL Delaware Jurisdictional Winter Peak Demand (MW)



V. Disaggregated Forecasts For SOS and Choice Customers.

Projections of the demand requirements by state or jurisdiction, or by SOS and Choice customers, or by rate class are calculated in a spreadsheet model that uses sharing techniques. Projections of energy requirements broken down by SOS and Choice customers or by rate class are also calculated in the same spreadsheet model. Typical results are presented in Tables 6 and 7, below.

In each rate class, the number of customers that choose to use competitive suppliers is taken to be a constant percentage of total customers in the class. Constant shares are used for forecasting Choice Customers because even though the fraction of any rate class that chooses Choice is extremely volatile it does not appear to have a trend over time. Logic tells us that if customers could get a better deal by choosing a competitive supplier they would make that choice, with the share quickly going to 100%. That doesn't happen, however. As a result, since we do not have better information and there is no obvious trend, we assume that shares will remain constant at their current level.

Shares are allocated to the class being modeled according to their class contribution to the Delmarva Zone Summer Peak Hour Demand, non-coincident with the PJM peak, as presented in Appendix C.

Table 6
Summer Peak Demand Forecast Disaggregated by Rate Class

	DPL Zone Non-Coincident PHI forecast* (MW)	DE Share (MW)	DPL DE Share (MW)	DPL DE Res (MW)	DPL DE Small Com (MW)	DPL DE LC&I (MW)	DPL DE SL (MW)
2010	4,004	2,576	1,826	785	32	1,010	0
2011	3,991	2,568	1,820	782	32	1,007	0
2012	4,020	2,586	1,833	788	32	1,014	0
2013	4,050	2,605	1,847	793	32	1,021	0
2014	4,120	2,650	1,879	807	33	1,039	0
2015	4,214	2,711	1,922	826	33	1,063	0
2016	4,305	2,769	1,963	844	34	1,086	0
2017	4,398	2,829	2,005	862	35	1,109	0
2018	4,471	2,876	2,039	876	35	1,127	0
2019	4,550	2,927	2,075	892	36	1,147	0
2020	4,619	2,971	2,106	905	37	1,165	0
2021	4,685	3,013	2,136	918	37	1,181	0
2022	4,747	3,054	2,165	930	38	1,197	0
2023	4,812	3,095	2,194	943	38	1,213	0
2024	4,874	3,136	2,223	955	39	1,229	0
2025	4,932	3,173	2,249	966	39	1,244	0
2026	4,988	3,209	2,275	977	39	1,258	0
2027	5,038	3,241	2,297	987	40	1,270	0
2028	5,082	3,269	2,318	996	40	1,282	0
2029	5,130	3,300	2,340	1,005	41	1,294	0
2030	5,174	3,328	2,360	1,014	41	1,305	0
2031	5,213	3,353	2,377	1,021	41	1,315	0
2032	5,253	3,379	2,396	1,029	42	1,325	0
2033	5,297	3,407	2,415	1,038	42	1,336	0
2034	5,356	3,445	2,442	1,049	42	1,351	0
2035	5,415	3,483	2,470	1,061	43	1,366	0

*PHI MW forecast is unrestricted peak non-coincident with PJM Zonal Peak Demand
*PHI MW forecast does not include EE/DSM programs

Table 7
Energy Forecast Disaggregated by Rate Class

	DPL DE RES (MWh)	DPL DE COM (MWh)	DPL DE IND (MWh)	DPL DE Sm COM (MWh)	DPL DE LC&I (MWh)	DPL DE SL (MWh)
2010	2,948,982	3,499,041	1,906,335	164,466	5,240,910	37,907
2011	2,987,883	3,523,709	1,860,228	163,813	5,220,123	38,004
2012	3,050,053	3,548,477	1,846,653	164,154	5,230,976	38,143
2013	3,095,370	3,570,100	1,848,849	164,879	5,254,070	38,273
2014	3,143,137	3,591,068	1,848,786	165,515	5,274,339	38,380
2015	3,186,715	3,611,885	1,839,332	165,861	5,285,357	38,475
2016	3,237,783	3,633,394	1,836,598	166,432	5,303,560	38,566
2017	3,272,544	3,654,640	1,835,739	167,052	5,323,327	38,655
2018	3,315,733	3,676,039	1,833,913	167,648	5,342,304	38,741
2019	3,359,161	3,697,944	1,827,295	168,113	5,357,126	38,826
2020	3,411,773	3,720,071	1,827,362	168,788	5,378,644	38,912
2021	3,448,069	3,742,055	1,827,117	169,449	5,399,723	38,995
2022	3,492,723	3,764,333	1,826,947	170,122	5,421,158	39,076
2023	3,537,415	3,786,796	1,826,452	170,791	5,442,457	39,155
2024	3,590,717	3,809,558	1,826,292	171,478	5,464,372	39,232
2025	3,627,379	3,832,214	1,825,847	172,154	5,485,907	39,308
2026	3,672,343	3,855,140	1,825,678	172,846	5,507,972	39,380
2027	3,717,164	3,878,193	1,825,547	173,544	5,530,196	39,451
2028	3,771,057	3,901,848	1,834,602	174,539	5,561,911	39,521
2029	3,808,236	3,924,948	1,837,592	175,333	5,587,207	39,589
2030	3,853,663	3,948,540	1,839,081	176,096	5,611,525	39,655
2031	3,899,126	3,972,298	1,840,272	176,855	5,635,715	39,720
2032	3,953,184	3,996,396	1,842,279	177,649	5,661,025	39,784
2033	3,990,800	4,020,352	1,843,402	178,412	5,685,341	39,847
2034	4,033,776	4,043,117	1,847,621	179,234	5,711,504	39,911
2035	4,077,216	4,066,011	1,851,849	180,059	5,737,802	39,975

Appendix A: Data Dictionary

Zonal or Jurisdictional Energy and Demand Variables

LGRODPLDE – DPL's Gross retail Output for the DPL Delaware jurisdiction. This is the amount of energy put into the system, before losses, to serve the needs of DPL's jurisdictional retail sales. Measured in MWh.

MWDPL – The monthly peak hour metered demand observed on the Delmarva Zone, non-coincident with the PJM peak demand measured in MW.

NSODPL – The monthly metered Net Sendout for the Delmarva Zone. This data differs from the PJM Net Energy for Load in that the latter includes the losses on the 500 kVa system that are allocated back to the zones by PJM. Measured in MWh.

Weather Related Variables

CDD65WLM – Monthly cooling degree days measured on a comfort threshold of 65 degrees Fahrenheit, based upon NOAA weather data collected at the New Castle County Regional Airport.

HDD65WLM – Monthly heating degree days measured on a comfort threshold of 65 degrees Fahrenheit, based upon NOAA weather data collected at the New Castle County Regional Airport.

MWCDWIL – Cooling degrees at the time of the Delmarva Zonal peak demand (non-coincident with the PJM peak system demand) measured on a comfort threshold of 65 degrees Fahrenheit, based upon NOAA weather data collected at the New Castle County Regional Airport.

MWHDWIL – Heating degrees at the time of the Delmarva Zonal peak demand (non-coincident with the PJM peak system demand) measured on a comfort threshold of 65 degrees Fahrenheit, based upon NOAA weather data collected at the New Castle County Regional Airport.

Economic Variables

CPI08 – A factor, equal to 215.2239183, that is used to rebase CPIU so that it is expressed with a base year of 2008=100.

CPIU – The Consumer Price Index, All Urban, with a base period of 1982-84=100. The Consumer Price Index is published by the Bureau of Labor Statistics, US Department of Commerce.

ETDE – Total Non-Agricultural Payroll Employment for the State of Delaware. Published by the Bureau of Labor Statistics, US Department of Commerce.

ETSAL – Total Non-Agricultural Payroll Employment for the Salisbury, MD Metropolitan Statistical Area. Published by the Bureau of Labor Statistics, US Department of Commerce.

JPRIDE – The total all-in price of electricity, measured in $/kWh, for retail sales within the DPL DE jurisdiction, inclusive of all taxes, surcharges and the commodity component. The cost of electricity provided is estimated for choice customers by assuming that cost is equal to the cost experienced by DPL in serving Standard Offer Service customers within the DE jurisdiction.

JPRIDPL – The total all-in price of electricity, measured in $/kWh, for retail sales within the DPL service areas, inclusive of all taxes, surcharges and the commodity component. The cost of electricity provided is estimated for choice customers by assuming that cost is equal to the cost experienced by DPL in serving Standard Offer Service customers.

Dummy Variables

APR – A categorical variable coded 1 during the month of April and zero otherwise.

AUG – A categorical variable coded 1 during the month of August and zero otherwise.

FEB – A categorical variable coded 1 during the month of February and zero otherwise.

JAN – A categorical variable coded 1 during the month of January and zero otherwise.

JUL – A categorical variable coded 1 during the month of July and zero otherwise.

JUN – A categorical variable coded 1 during the month of June and zero otherwise.

MAR – A categorical variable coded 1 during the month of March and zero otherwise.

MAY – A categorical variable coded 1 during the month of May and zero otherwise.

NOV – A categorical variable coded 1 during the month of November and zero otherwise.

OCT – A categorical variable coded 1 during the month of October and zero otherwise.

OCT04 – A categorical variable coded 1 during the month of October 2004 and zero otherwise.

SEP – A categorical variable coded 1 during the month of September and zero otherwise.

Appendix B: Estimated Equations

The following regressions were estimated using the EViews econometrics software package.

- DPL DE Jurisdictional Gross Retail Output (MWh).

```
============================================================================
Dependent Variable: LGRODPLDE
Method: Least Squares
Date: 09/30/09   Time: 10:47
Sample (adjusted): 2002M02 2009M07
Included observations: 90 after adjustments
Convergence achieved after 16 iterations
============================================================================
             Variable             Coefficient Std. Error t-Statistic  Prob.
============================================================================
                 C                  746906.1   25391.71   29.41535   0.0000
           ETDE*CDD65WLM            1.900940   0.071304   26.65969   0.0000
           ETDE*HDD65WLM            0.396721   0.031358   12.65126   0.0000
@MOVAV(JPRIDE(-2)/(CPIU(-2)/CPI08),-1034490.   253762.8  -4.076602   0.0001
                JAN                 44887.14   7985.482   5.621093   0.0000
                APR                -44359.68   7298.578  -6.077853   0.0000
                NOV                -38396.09   7851.819  -4.890089   0.0000
               OCT04               -38213.24   20587.29  -1.856157   0.0671
               AR(1)                0.545883   0.099198   5.502945   0.0000
============================================================================
R-squared                           0.945907    Mean dependent var 790682.1
Adjusted R-squared                  0.940564    S.D. dependent var 94105.11
S.E. of regression                  22942.26    Akaike info criteri23.01399
Sum squared resid                   4.26E+10    Schwarz criterion  23.26397
Log likelihood                     -1026.629    F-statistic        177.0526
Durbin-Watson stat                  2.070821    Prob(F-statistic)  0.000000
============================================================================
Inverted AR Roots                        .55
============================================================================
```

- Delmarva Zonal Net Sendout (MWh).

```
==========================================================================
Dependent Variable: NSODPL
Method: Least Squares
Date: 09/30/09   Time: 10:47
Sample (adjusted): 1999M12 2009M07
Included observations: 116 after adjustments
Convergence achieved after 68 iterations
==========================================================================
             Variable                Coefficient Std. Error t-Statistic Prob.
==========================================================================
                 C                    1325800.   75857.44   17.47752   0.0000
       (ETDE+ETSAL)*CDD65WLM          3.354756   0.182114   18.42124   0.0000
       (ETDE+ETSAL)*HDD65WLM          1.212006   0.045469   26.65563   0.0000
@MOVAV(JPRIDPL(-2)/(CPIU(-2)/CPI08)-1505852.    748598.3  -2.011562   0.0469
                FEB                  -130860.2   11647.96  -11.23460   0.0000
                MAR                  -72102.56   13385.26  -5.386715   0.0000
                APR                  -106902.1   11635.70  -9.187422   0.0000
                JUN                   61170.73   18650.91   3.279772   0.0014
                JUL                   148942.4   28550.60   5.216789   0.0000
                AUG                   183288.9   29821.31   6.146240   0.0000
                SEP                   124450.8   18818.69   6.613146   0.0000
                OCT                   84777.48   13523.86   6.268732   0.0000
               OCT04                 -73685.22   31270.12  -2.356410   0.0204
               AR(1)                  0.775688   0.081428   9.526035   0.0000
==========================================================================
R-squared                             0.968293   Mean dependent var 1579013.
Adjusted R-squared                    0.964252   S.D. dependent var 196223.8
S.E. of regression                    37100.31   Akaike info criteri23.99340
Sum squared resid                     1.40E+11   Schwarz criterion  24.32573
Log likelihood                       -1377.617   F-statistic        239.6127
Durbin-Watson stat                    2.198251   Prob(F-statistic)  0.000000
==========================================================================
Inverted AR Roots                          .78
==========================================================================
```

- Delmarva Zonal Peak Demand (MW).

```
============================================================================
Dependent Variable: MWDPL
Method: Least Squares
Date: 09/30/09   Time: 10:47
Sample (adjusted): 1992M05 2009M07
Included observations: 207 after adjustments
Convergence achieved after 15 iterations
============================================================================
             Variable                Coefficient Std.Error t-Statistic  Prob.
============================================================================
                 C                    -1518.602   302.8747  -5.013960   0.0000
       (ETDE+ETSAL)*MWHDWIL            0.038299   0.003166   12.09685   0.0000
       (ETDE+ETSAL)*MWCDWIL            0.109066   0.005514   19.78119   0.0000
@MOVAV(JPRIDPL(-3)/(CPIU(-3)/CPI08)-1294.326   1347.092  -0.960830   0.3378
                MAY                   -252.5315   54.39455  -4.642589   0.0000
                SEP                    81.71361   54.25974   1.505971   0.1337
                NOV                   -95.39611   53.42272  -1.785684   0.0757
   @MOVAV(ETDE(-2)+ETSAL(-2),6)        7.987847   0.623860   12.80392   0.0000
               AR(1)                   0.311748   0.075406   4.134285   0.0001
============================================================================
R-squared                              0.858460    Mean dependent var 2755.579
Adjusted R-squared                     0.852742    S.D. dependent var 568.3608
S.E. of regression                     218.1043    Akaike info criteri13.65033
Sum squared resid                      9418760.    Schwarz criterion  13.79523
Log likelihood                        -1403.809    F-statistic        150.1126
Durbin-Watson stat                     1.968559    Prob(F-statistic)  0.000000
============================================================================
Inverted AR Roots                           .31
============================================================================
```

Appendix C: Delmarva Zone Peak Demand By Rate Class

Table C-1
Delmarva Zone Peak Demand By Rate Class
(Non-Coincident With PJM System Peak, August 21, 2009, 3:00 PM)

CUSTCLASSCODE	CUSTCLASSNAME (Description)	kWh at HE 08/21/09-15:00
DE_DEMECT	DE_DEMECTRANS	414887.861
DE_GSPTOU	Delaware General Service Primary Tou	420347.132
DE_GSPTOUH	Delaware General Service Primary Tou Hourly	14691.128
DE_GSPTOUMIN	Delaware General Service Primary Tou	5140.747
DE_GSSPHTG	Delaware General Service Space Heating	5944.766
DE_GSTTOU	Delaware General Service Transmission Tou	127496.006
DE_GSWTRHTG	Delaware General Service Water Heating	122.195
DE_LGSTOU	Delaware Large General Service	118607.932
DE_LGSTOUH	Delaware Large General Service Hourly	2406.606
DE_MGSOPS	Delaware Medium General Service Off Peak	4556.909
DE_MGSSBASIC	Delaware Medium General Service	269771.867
DE_ODECPRI	Delaware ODEC Primary	9990.348
DE_ODECT	DE_ODECTRANS	294650.164
DE_OLBASIC25	Delaware Outdoor Lighting Rate 25	0
DE_OLBASIC30	Delaware Outdoor Lighting Rate 30	0
DE_ORLBASIC	Delaware Outdoor Recreational Lighting	0
DE_RSBASIC	Delaware Residential Service	545766.735
DE_RSHEATING	Delaware Residential Heating	206808.501
DE_RSTOUD	Delaware Residential Tou Demand	9.54
DE_RSTOUND	Delaware Residential Tou Non Demand	427.695
DE_SGSBASIC	Delaware Small General Service	30411.001
MD_BERLINT	MD_Berlin Trans	2485.436
MD_GSP3TOU	Maryland General Service Primary Tou 3	94942.069
MD_GSPTOU	Maryland General Service Primary	28944.17
MD_LGS3TOU	Maryland Large General Service Tou 3	18647.144
MD_LGSTOU	Maryland Large General Service	68832.262
MD_ODECPRI	Maryland ODEC Primary	58609.879
MD_ODECT	MD_ODECTRANS	161897.373
MD_OLBASIC25	Maryland Outdoor Lighting Rate 25	0
MD_OLBASIC30	Maryland Outdoor Lighting Rate 30	0
MD_ORLBASIC	Maryland Outdoor Recreational Lighting	0
MD_RSBASIC	Maryland Residential Service	492798.105
MD_RSTOUND	Maryland Residential Tou Non Demand	259.689
MD_SG2BASIC	Maryland Small General Service 2	159815.426
MD_SG2OPS	Maryland Small General Service Off Peak 2	2157.905
MD_SGSBASIC	Maryland Small General Service	52244.27
MD_SGSCON	MD_SGSCONOWINGO	4781.494
MD_SGSOPS	Maryland Small General Service Off Peak	27.403
MD_SGSSPHTG	Maryland Small General Service Space Htg	21730.682
MD_SGSTN	Maryland TELECOM NETWORK	470.996
MD_SGSWH	MD_SGSWWTRHTG	31.14
VA_ODECT	VA_ODECTRANS	144067.427
Grand Total		3784780.003