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July 18, 2012

M-2009-2093216

Rosemary Chiavetta
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

RE: PPL Electric Utilities Corporation - Time of Use Report

Dear Secretary Chiavetta:

Enclosed for filing please find the Time of Use Report for PPL Electric Utilities Corporation. The report is being submitted pursuant to the provisions of 66 Pa.C.S. § 2807(e)(5).

Respectfully Submitted,

Michael W. Hassell

MWH/skr
Enclosures

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PPL Electric Utilities Corporation
Time-of-Use Program
Annual Report

Period of Study: Years 2009, 2010 and 2011

Overview

Pursuant to 66 Pa. C.S. § 2807(f)(5), PPL Electric Utilities Corporation ("PPL Electric" or the "Company") hereby files this Annual Report regarding its Time-of-Use ("TOU") program. This Annual Report assesses the impact of PPL Electric Utilities' Time-of-Use program offered to its residential and small commercial and industrial (Small C&I) customer classes on load shifting, energy prices and consumption. Three consecutive years, starting with 2009, were studied, with 2010 and 2011 compared against their immediate prior year.

The objective of the TOU program is to encourage customers to shift their electricity usage from the on-peak to the off-peak periods. The intent is that lower on-peak usage will ultimately lower energy and capacity prices, not just for the participants in the TOU program, but for all customers. For the purpose of this report, a range of components including, but not limited to, load, customer participation, shopping, pricing and change in capacity were evaluated across different rate schedules.

The TOU program offered by PPL Electric Utilities is available to all residential and small C&I customers served under rate schedules RS, RTS(R), GS-1, GH-1, GH-2 and IS-1. The program is also available to GS-3 customers with a demand of less than 500 kW and RTD(R) customers that accept service under rate schedule RS. However, only customers who have PPL Electric as their default supplier are eligible to participate in PPL's TOU Program. Customers who choose to have competitive generation supply are ineligible to participate.

Summary

During the 2011 summer period, PPL Electric estimates that its customers on the TOU program shifted their on-peak consumption to the off-peak period, with customers on rate TR-1 decreasing on-peak consumption by 0.35% compared to RS customers. However, when compared TOU groups only from 2010 to 2011, the on-peak proportion increased by 2.94% for TR-1 customers. This could be due to the increased participation in the TOU program in response to drop in prices, and the lack of any price incentive to shift load to the off-peak period by these new customers in the program.

Overall energy consumption changes attributable specifically to the TOU program cannot be determined. Federal and state energy efficiency programs, price increases with the expiration of rate caps in Pa, and the challenging economic

conditions, all worked simultaneously to reduce energy consumption during this period of study.

For 2011, energy costs for customers on a TOU rate were reduced marginally. For the average residential customer using 1000 kWh per month, the savings amounted to a $ 0.18 reduction in their monthly energy cost.

Reductions in capacity costs due to reduced on-peak usage from TOU customers would not be evident for 3 years. Capacity prices are based on the PJM Base Residual Auction, which procures capacity 3 years in advance. Any lower demand in the 5 Coincident Peak (CP) hours on PJM could potentially result in lower bid prices in the auction, but it is not possible to quantify the impact.

Methodology

The primary focus of this study is to measure the percentage of load shifted from the on-peak to the off-peak period under the TOU program. However, customer participation and load shift based on TOU pricing relative to the price-to-compare (PTC) was also measured in this study. For the scope of this study, only summer months' load shapes for customers served under rate schedules RS, RTS(R), GS-1, GS-3, GH-1, GH-2 and IS-1 rate schedules were analyzed to determine the shift in usage during on-peak and off-peak periods for each rate schedule. Peak load hours in the summer months determine the need for capacity within PJM. Reductions in on-peak usage during the summer months would reduce the capacity Peak Load Contribution (PLC) for customers on the TOU programs, which reduces the capacity needs for all of PJM, thus reducing the cost of capacity for all customers. Summer is defined as June 1 through September 30. The on-peak and off-peak definitions are shown in Figure 1.

Figure 1

Rate schedule	Summer peak hours (June – September)
RS, RTS(R), Volunteer Fire Company served under rate schedules GS-1 and GS-3	1:00 PM to 6:00 PM
GS-1, GS-3, GH-1, GH-2 and IS-1	7:00 AM to 7:00 PM

Note: On-peak hours occur only during weekdays with the exception of holidays which are considered to be off-peak.

In order to measure any change or shift in consumption between the on-peak and off-peak periods, three different approaches were applied and analyzed. These are discussed below:

- Control group to Control group: A control group is defined as the primary traditional rate group not participating in any TOU program. Monthly aggregations were used to measure the on-peak and off-peak consumption. Usage by rate schedule was analyzed for customers who were not on TOU program during the current and the prior time period for each year.

- Customers not on TOU to on TOU: A comparison was done of customers who were not on TOU rate during a year and moved to a TOU rate during the following year.

- TOU group to TOU group: A comparison was done of customers who were on a TOU rate during a year and continued to be on TOU rate during the subsequent year. This approach was applied to see if staying on the TOU rate resulted in any continued load shift to the off-peak period.

Using a percentage change from the prior period, and comparing to the control group takes into consideration 1) differences in weather conditions from one year to the next, and 2) the fact that customers on TOU may already use less energy in the on-peak period than other customers.

While the focus of this study is the shifting of energy from the on-peak to the off-peak period, one area not analyzed in this study was the impact on overall consumption. Concurrent with the implementation of these TOU programs, there were several other factors that would impact overall consumption:

- Federal energy programs mandated under the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007.
- Energy efficiency programs implemented under Pa Act 129
- The state of the economy following the recent recession
- The expiration of rate caps in 2010 for PPL Electric customers, which resulted in increased prices, which act to reduce energy consumption

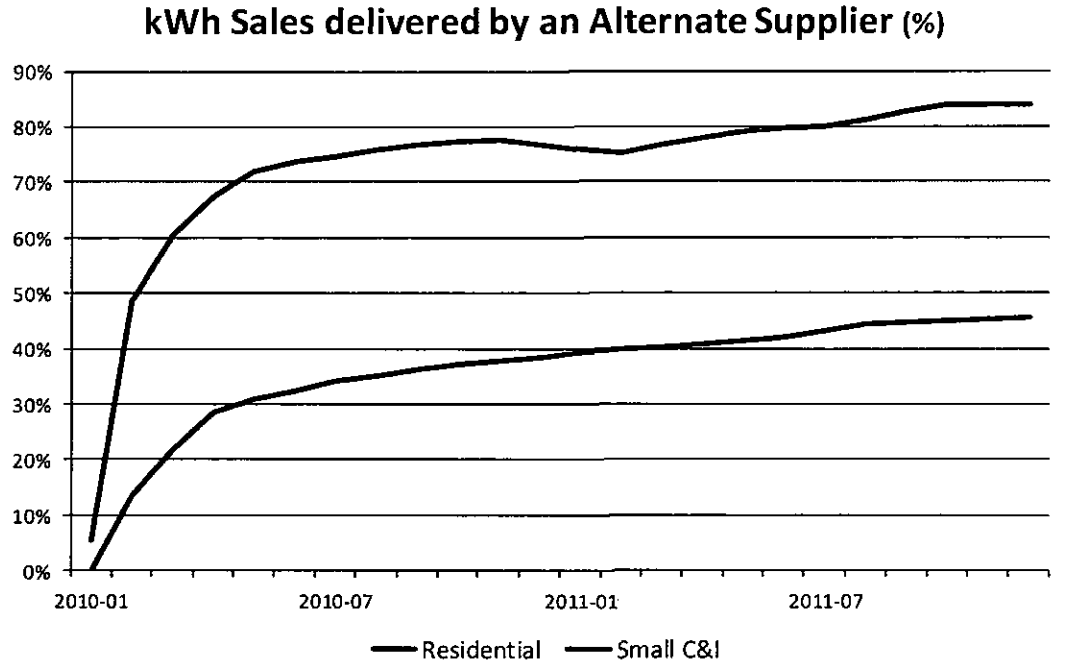
In addition, the reductions in on-peak usage, such as doing laundry at night rather than in the afternoon, do not result in overall reductions in consumption, just a shifting of consumption to the off-peak period. All of these factors make it difficult to identify any change in consumption specifically as a result of TOU program.

Lastly, the impact of the TOU program on both the energy and capacity market was assessed.

Influence of Shopping on TOU Participation

Participation in the TOU program is only available to customers who choose PPL Electric as their default supplier instead of an alternate/ competitive supplier. As the rate caps came off beginning 2010, shopping became an attractive option for customers served in PPL Electric's service territory. The chart below exemplifies the growth in shopping for both residential and small C&I customers. With the increase in shopping fewer customers were left in the TOU eligible pool. However, they were free to participate in the TOU plans offered by alternate suppliers. In fact, alternate suppliers did offer their own TOU programs, such as a "free Saturday" program offered by one supplier.

Figure 2



Price Effect on TOU Participation

There was a marked increase in participation in the TOU program during the first half of 2011. The market price of electricity played an important role in prompting customers to enroll in the program during this time. The TOU program prices were based on the forward market for energy at the time the rate was set each seasonal, while the Price to Compare (PTC) for the fixed price default supply was based on various bids over a 3-year period. As Figures 2 through Figure 4 show, interest in the TOU rates was low in 2010 when the on-peak price was above the PTC. However, as the forward prices for energy dropped below the PTC, interest in the TOU program increased in early 2011. In June 2011, when the PTC moved below both the on-peak and off-peak TOU prices, participation dropped.

Figure 3

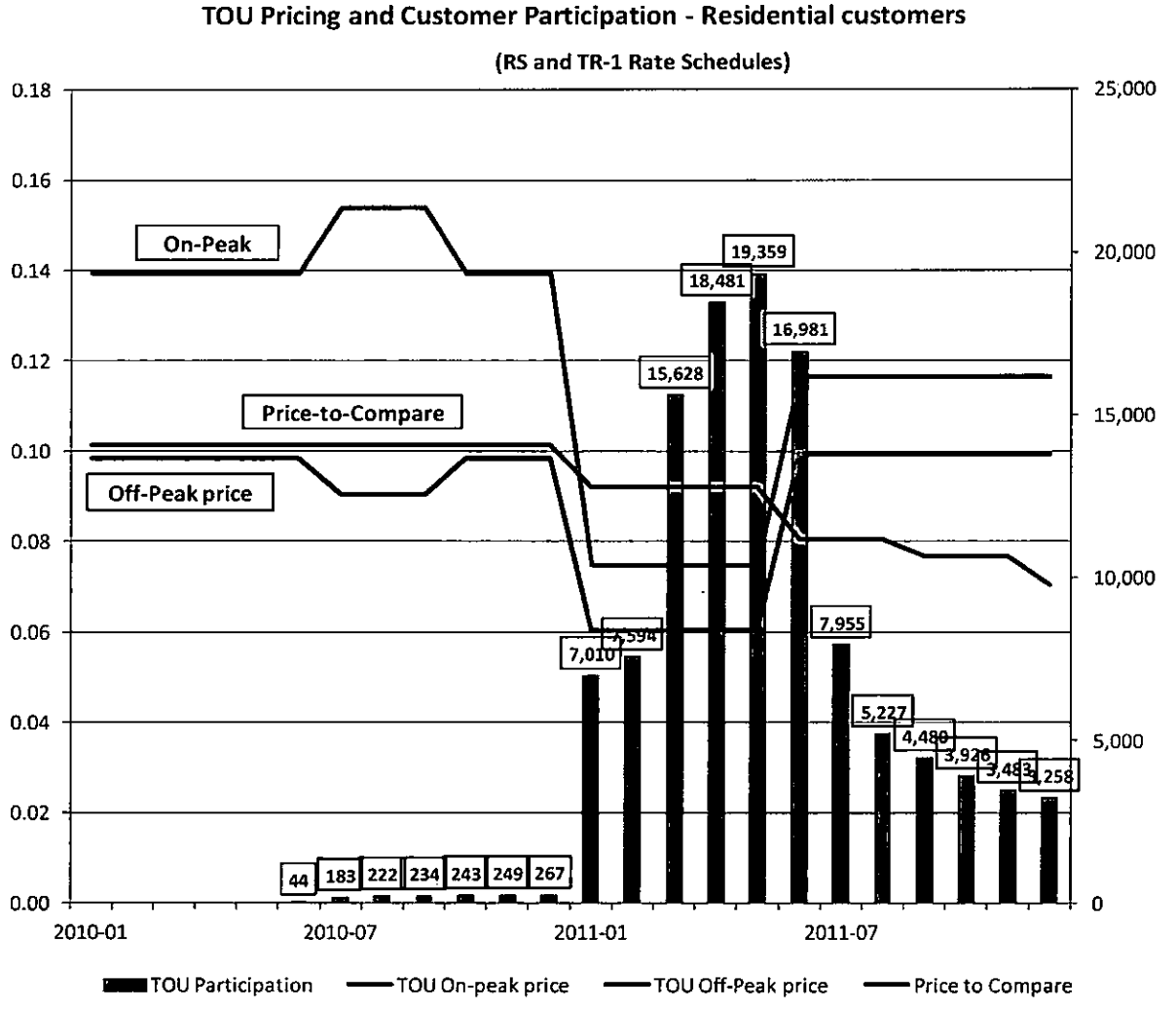
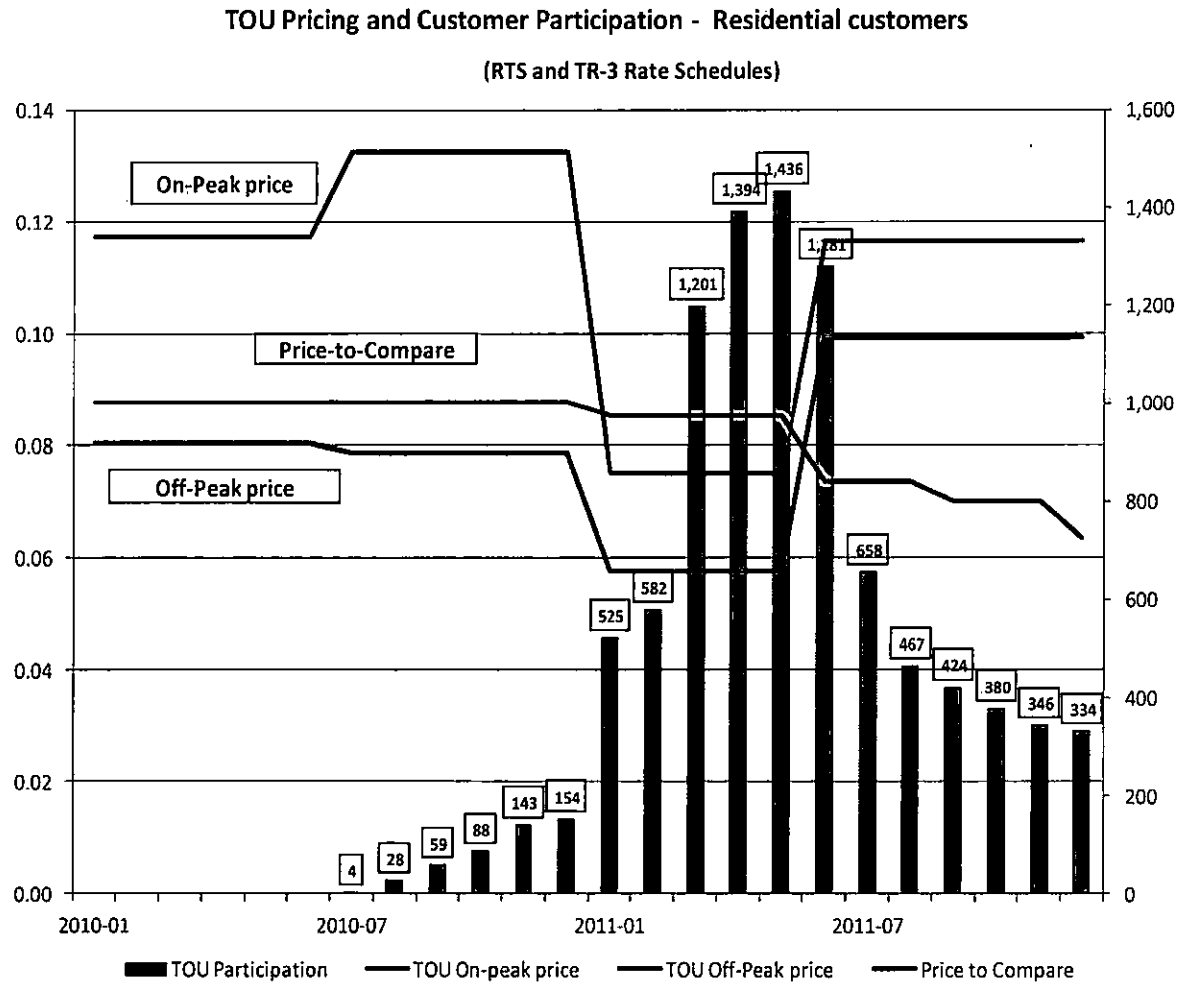
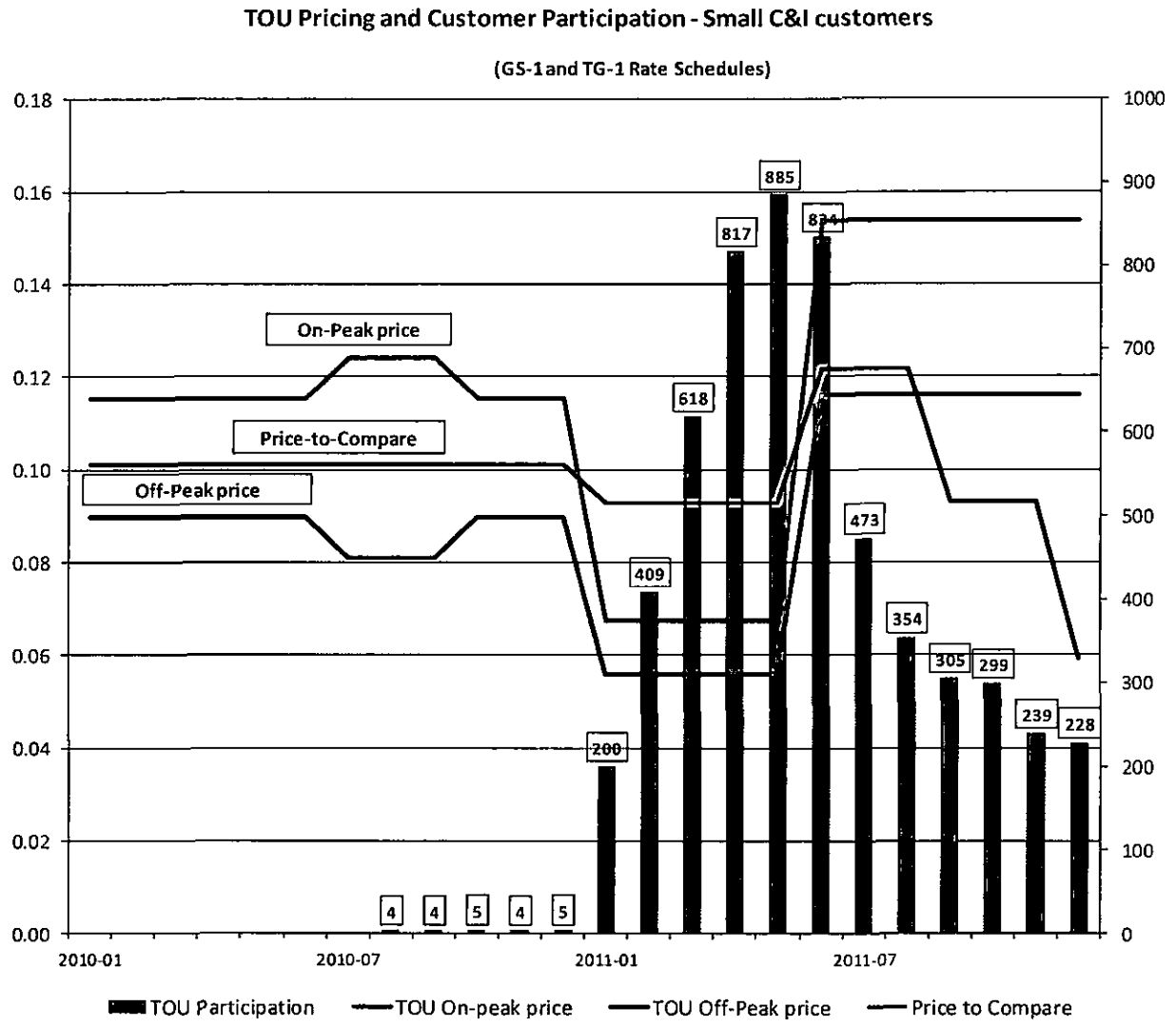


Figure 4



TOU participation for RS and RTS(R) rate schedules was at its peak level in May 2011. Customers began enrolling in the program starting 2011, in response to the low TOU price offered due to low forward market prices for energy. Both on-peak and off-peak TOU prices fell below the PTC level. As a result, it is believed that many customers enrolled in the TOU program not to reduce load during on-peak hours, but simply to save money, as it was the lowest price offered. This is further supported by the drop in participation as the price increased beginning in June 2011. Since then, while the TOU price has remain unchanged and PTC has fallen below the TOU price, TOU participation has continued to fall.

Figure 5



Small C&I customers showed a similar response to the change in price as the residential customers. As the price increased in June 2011, participation started to drop.

Because customers may have moved to the TOU rate for reasons other than to shift load during the non-summer period in early 2011, and because the largest impact of TOU programs is during the summer, with the higher energy prices during hot weather, and the fact that capacity prices are based on summer peaks, the focus of this report will be the summers of 2010 and 2011.

Analysis of Load Shift

Two different sets of time periods were analyzed to measure the consumption pattern between on-peak and off-peak periods, in this study. First, customer participation in year 2011 was compared to year 2010. Likewise, participation in year 2010 was compared to year 2009.

- **Control group to TOU**

Tables 1a and 1b show the percentage shift in load between on-peak and off-peak periods for each rate schedule with a corresponding TOU rate. This comparison was done only of customers who were not participating in any TOU Program. For the summer period, the sum of monthly aggregations, split between on-peak and off-peak, was used to calculate the percentages. Tables 2a and 2b show the split for customers who switched to a TOU rate.

Comparing the two different shift patterns, results show that customers who moved to TOU program shifted consumption to the off-peak hours relative to customers who were not on a TOU rate. This held true for both the time periods.

Table 1a: Control group to Control group 2010 to 2011

Rate Schedule	2010		2011		Percentage point change in On-Peak
	On-Peak	Off-Peak	On-peak	Off-Peak	
GH-1	52.79	47.21	51.94	48.06	-0.85
GH-2	45.15	54.85	44.13	55.87	-1.02
GS-1	46.40	53.60	45.50	54.50	-0.89
GS-3	45.82	54.18	45.34	54.66	-0.47
RS	17.68	82.32	17.18	82.82	-0.50
RTS (R)	17.65	82.35	17.20	82.80	-0.45

Table 2a: Customers not on TOU in 2010 to TOU in 2011

Rate Schedule	Corresponding TOU Rate	2010		2011		Percentage point change in On-Peak
		On-Peak	Off-Peak	On-peak	Off-Peak	
GH-1	TH1	52.49	47.51	48.92	51.08	-3.58
GS-1	TG1	44.97	55.03	44.95	55.06	-0.03
GS-1	TG2	57.06	42.94	58.62	41.38	1.56
GS-3	TG3	48.05	51.95	46.86	53.14	-1.19
RS	TR1	17.44	82.56	16.60	83.40	-0.85
RTS(R)	TR3	17.11	82.89	15.48	85.52	-1.63

Table 1b: Control group to Control group 2009 to 2010

Rate Schedule	2009		2010		Percentage point change in On-Peak
	On-Peak	Off-Peak	On-peak	Off-Peak	
GS-1	48.09	51.91	46.40	53.60	-1.69
GS-3	46.67	53.33	45.82	54.18	-0.85
RS	16.98	83.02	17.68	82.32	0.70
RTS (R)	16.66	83.34	17.65	82.35	0.99

Table 2b: Customers not on TOU in 2009 to TOU in 2010

Rate Schedule	Corresponding TOU Rate	2009		2010		Percentage point change in On-Peak
		On-Peak	Off-Peak	On-peak	Off-Peak	
GS-1	TG1	21.94	78.06	19.91	80.09	-2.03
GS-1	TG2	93.20	6.80	84.86	15.14	-8.34
RS	TR1	15.68	84.32	14.21	85.80	-1.47
RTS(R)	TR3	15.10	84.90	13.26	86.74	-1.84

For customers on rate TR-1, in the summer of 2010 they reduced their on-peak consumption by 1.47%, while customers on rate RS increased usage by 0.70%. This increase was the result of warmer weather in 2010 relative to 2009, but one can infer a 2.17% decrease in on-peak consumption for customers on TR1 relative to the control group.

For 2011, the results were somewhat less significant. RS customers decreased on-peak usage 0.50% while TR1 customers decreased by 0.85%, an implied difference of 0.35%. This is most likely due to the fact that many customers went on a TOU rate in early 2011 due to the price advantage relative to the PTC, and did not have to make any changes in usage in order to save money. As the price increased in June 2011, and both the on-peak and off-peak prices moved above the PTC, these customers remained on the TOU rates despite the higher prices. These customers may not have realized the price change or simply did not take the effort to leave the TOU rate, and did not take significant effort to shift load out of the on-peak period.

Similar results were seen in the other TOU rate schedules relative to their respective control group.

- **TOU group to TOU group**

Customers who stayed on the TOU rate during both prior and current periods were studied in this comparison. Only three rate schedules – TG-1, TR-1 and TR-3 had customers that met the criteria of continuing to be on the TOU rate. However, TG-1 (TOU rate schedule for GS-1) had only 1 customer enrolled. Due to its very small size, TG-1 was ignored to measure any load shift. That left us with only residential customers – TR1 (TOU rate schedule for RS) and TR3 (TOU rate schedule for RTS).

While both TR1 and TR3 customers increased their on-peak consumption as shown in Table 3 below, it is vital to note that customer participation increased from 300 during summer 2010 to 18,000 in 2011. Also, as mentioned earlier, customers switched to TOU rate to take advantage of lower prices and not necessarily to reduce their on-peak load. They may have remained on the rate, or were "sticky" customers, and not making an effort to reduce on-peak usage. For these reasons, this comparison is not considered valid.

Table 3: TOU to TOU

Rate Schedule	2010		2011		Percentage point change in On-Peak
	On-Peak	Off-Peak	On-peak	Off-Peak	
TR1	14.25	85.75	16.69	83.31	2.44
TR3	14.60	85.40	15.61	84.39	1.01

Impact on Market Prices

- **Energy**

Prices for energy vary by hour. The Locational Marginal Price (LMP) is determined through the wholesale market at PJM for each zone, and is a function of overall demand (which is highly dependent upon weather), generation availability, and fuel prices. In theory, lower demand during peak hours would result in a lower LMP, as higher priced generation would not be required. However, quantifying the impact on an hourly basis is difficult – there is no way of knowing what the LMP would have been absent the demand reduction. In addition, any load shifted to off-peak hours could result in higher prices in these hours, so the net impact in a TOU rate on energy prices would be the net of 1) the savings in the on-peak hours and 2) the higher cost in the off-peak hours.

While the exact impact may not be known, an estimate of the impact of load shift on customer bills can be made using the on-peak and off-peak prices. For the summer of 2011, for the residential on-peak period, the average LMP was 9.88 ¢/kWh and the off-peak price was 4.79 ¢/kWh. Customers on TR1 reduced their on-peak kWh during this period by 0.35% relative to the control group. For the average residential customer using 1000 kWh per month, this would amount to a $ 0.18 reduction in their monthly energy cost.

- **Capacity**

Overall capacity costs are based on the PJM Base Residual Auction, which procures capacity 3 years in advance. Any lower demand in the 5 Coincident Peak (CP) hours on PJM could potentially result in lower bid prices in the auction, but it is not possible to quantify the impact.

These 5 CP hours are also the basis for the Capacity Peak Load Contribution (PLC) assigned to PPL Electric for the following PJM Planning Year, which runs from June 1 to May 31. Any reduction in usage during the 5CP hours could reduce the overall PLC for PPL Electric. If a customer reduces load during the 5 CP hours in a summer, their Capacity PLC may be reduced for the following planning year. However, the total Zone PLC is a weather-normalized peak forecast from PJM. If the customer's entire change in their 5 CP allocation is due to weather, then the customer may not see any change in their PLC allocation. Also, if a customer participates in a PJM Demand Response program, their reduction is added back to their hourly load to derive their unrestricted load, and this unrestricted load is the basis for the PLC allocation. The reason for this is that the customer is being compensated for the reduction in the Demand Response program, and to therefore also reduce their PLC would result in "double dipping".

At the current capacity price of $133.31 per MW-Day, a 1 kW reduction in a customer's Capacity PLC will save the customer's supplier $48.62 a year, or $4.05 per month. This ultimately should result in a lower price from the supplier, whether a default service supplier or a competitive supplier.

Conclusion

For the summer period, more energy consumption was shifted out of the on-peak period by customers on a TOU rate compared to customers who continued to be in the control group. During 2011, residential customers, on the TR1 rate reduced their on-peak load by 0.85% compared to 0.50% by customers on the RS rate, a 0.35% difference. This gap was wider in 2010 where on-peak consumption by the control group increased and TOU group showed marked decrease.

Total customers enrolled into the TOU program for both years did not show a decrease in on-peak consumption. This is believed to be in response to prices and not necessarily in an effort to reduce on-peak electricity consumption. Many customers went on the TOU rates in early 2011, when both the on- and off-peak rates were lower than the PTC. Even after this situation ended, many customers continued on the rate, but may be considered "sticky" customers on the program.