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ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

RE: Docket Nos. E-01345A-03-0775 AND E-01345A-04-0657
Decision No. 68112

Dear Sir/Madam:

Pursuant to Decision No. 68112 (September 9, 2005), Arizona Public Service Company ("APS") hereby submits its study on the impact of re-classifying May as a non-summer month for purposes of kWh estimation. The report has been prepared in accordance with Paragraph 17 of the Settlement Agreement in the above-referenced Docket.

If you have any questions regarding the attached report, please contact me at 602-250-3933.

Sincerely,

David Rumolo
Manager
Regulation & Pricing

Cc: Brian Bozzo
Erinn Andreasen
Barry Reed
Jeffrey Proper

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AZ Corporation Commission
Director of Utilities

Bill Estimation - May Energy Usage

Arizona Public Service

December 2005

Introduction

Pursuant to Decision No. 68112 (September 9, 2005), APS was required to assess the impact of reclassifying May from a summer to a winter month for the purposes of estimating monthly kWh consumption using the seasonal average daily consumption procedure outlined in Schedule 8. Under such procedure, the prior six months of usage during the same season is utilized to estimate kWh consumption during the current month when such estimation is necessary.

Summary and Recommendation

The present classification of months as either summer or winter for purposes of estimating kWh consumption mirrors that used for billing purposes under the Company's approved rate schedules. May through October are considered summer months, while November through April are winter months. However, APS reads meters and bills customers throughout each month based on a twenty-one cycle schedule. Thus, bills rendered early in the cycle will include energy used during the previous month. Specifically, bills to customers whose meters are read early in the month of May will include of energy that was consumed in April. Because April is typically a lower usage month for many customers, a question arose during the Commission investigation resulting in Decision No. 68112 as to whether May energy consumption should be estimated using a winter average value, rather than a summer value.

This study examines several factors including 1) the monthly energy consumption for the total retail load, 2) the monthly usage per customer for residential, small general service and medium general service customer classes, and 3) the average daily load shape and monthly consumption during the time-of-use on-peak hours.

The study also assessed any unintended consequences caused by shifting May to the winter period. For example, such a change would change the energy estimates for other months, since they would be based on a new mix of seasonal months. The winter seasonal estimate would be based on seven months - November through May; the summer estimate would be based on five months - June through October. The study further notes, but cannot objectively evaluate in the absence of experience, the potential for customer confusion caused by any discrepancy between seasonal billing months and the months used for kWh estimation.

The study finds that for the period 2003 through 2004, the total retail monthly energy consumption for May was lower than most summer months but higher than many of the winter months. It was closer to the winter than the summer average. Thus, this factor suggests that May could be reclassified as a winter month for purposes of estimating kWh.

Next, the study finds that the residential monthly usage per customer for May was below both the summer average and the winter average values, but more comparable to the winter value. For small general service customers, the May value is also much lower than the summer average seasonal values and only slightly higher than the winter value. Medium general service customers reflect the same results as residential customers, with average winter usage again being closer to actual May usage.

The monthly usage per customer data suggests that a winter seasonal value would be a modestly more reflective estimate of May energy consumption on average for many residential, small commercial and medium commercial customers. This increase in representation of actual May usage would be higher for customers in the early billing cycles in May, compared to those in the later billing cycles, where the results pretty much indicated no difference in average estimated kWh usage for May, irrespective of May's seasonal classification.

The study's comparison of typical daily load shape for May to that of other months indicates that the May load shape and the underlying customer usage pattern was much more consistent with a summer load shape than a winter load shape. Although this finding justifies retaining May as a summer month for billing purposes, it does not affect the prior conclusion that total kWh usage for May would be, for the most part, more reflective of average winter usage than average summer usage

Shifting May to a winter month for bill estimation purposes could cause some unintended consequences. It would, for example, change the energy estimates for other months, reducing some, increasing others. It would also likely impact the estimation of May energy usage when adequate historical billing information is not available to use the seasonal method.

Another potential disadvantage to switching May to the winter season for bill estimation purposes is that the bill estimation seasons would be inconsistent with the billing seasons, which include May in the summer season. However, the practical impacts of this discrepancy issue may not be significant and cannot be assessed without actual experience.

The study concludes that overall there would be some benefit to the estimation process from switching May to a winter month for bill estimation purposes. This would require a modification to Schedule 8, currently pending this Commission's approval.

APS' Method for Estimating Monthly Energy

Under proposed Schedule 8, which was filed on October 7, 2005 pursuant to Decision No. 68112, APS' method for estimating a customer's monthly energy usage for billing purposes includes several steps depending on data availability. If premise specific data is available, monthly energy is estimated with the seasonal average method, which uses the average daily kWh usage from the previous six months in the same season to estimate kWh in a particular month. It is used when there is an existing meter with sufficient

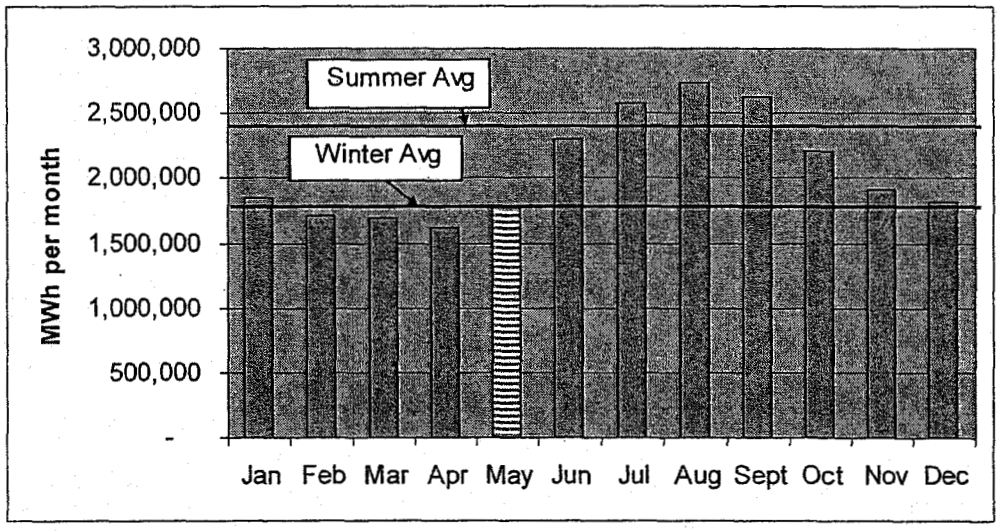
account history to obtain six months of seasonal data. The summer months are May through October; the winter months are November through April.

If there is not sufficient account history, the average daily energy is estimated using the kWh from the previous month, as long as the prior month is in the same season. If it is not, the usage from the same month in the previous year is used. If usage for the same month in the previous year is not available, then the usage from the previous month is used regardless of whether it is in the same season.

For time-of-use customers, the monthly total kWh and on-peak kWh are estimated using the daily average and on-peak usage for the relevant season. If sufficient account history is not available, the on-peak usage is estimated using a class average percentage of on-peak usage for summer and winter months.

May Energy Consumption Compared to Average Winter and Summer Months
From an energy usage standpoint, May is somewhat of a swing month. The monthly MWh total retail load for May is typically lower than most of the other summer months, but typically higher than many of the winter months. As depicted in Figure 1, May energy consumption averages about 1.77 million MWh for total retail load. By comparison, the average monthly energy consumption for summer months over the same period has been roughly 2.37 million MWh per month. The average monthly consumption for winter months has been approximately 1.77 million MWh per month. The typical total retail load for May closer to the winter average than the summer average.

Figure 1 Total Retail Load – MWH per Month
(Average 2003-2004)

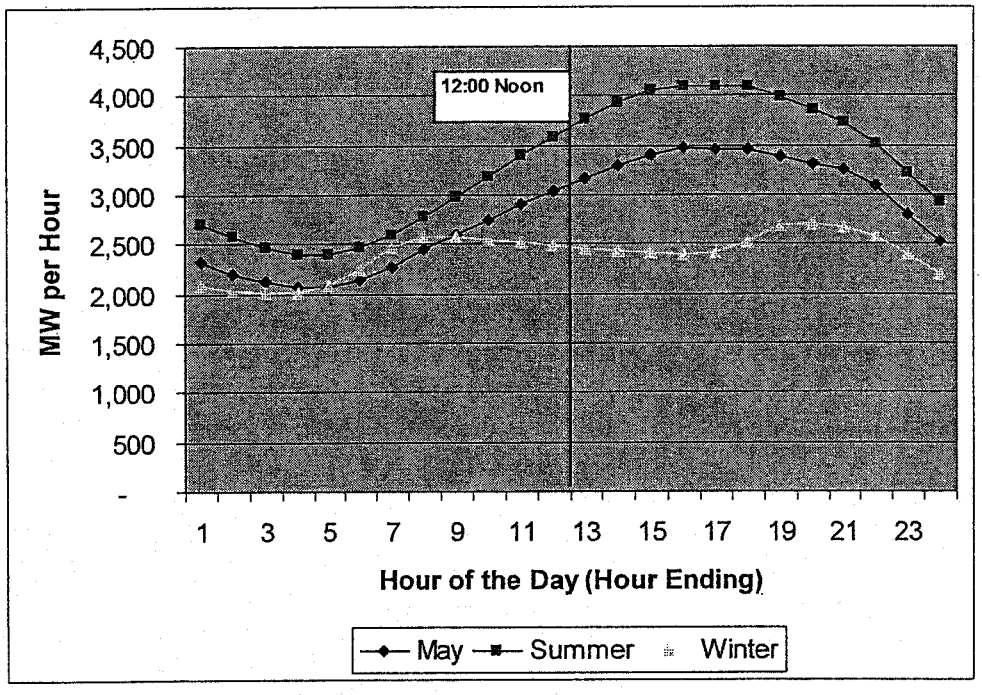


Actual total retail load data 2003 - 2004

May Average Daily Load Shape Compared to Winter and Summer Seasons
The daily load pattern for May resembles a summer month, rather than a winter month. As shown in Figure 2, the average daily load shape for the typical summer month begins to ramp up at 9:00 a.m., remains relatively high between 12:00 p.m. and 9:00 p.m., with the peak usage occurring between 4:00 p.m. and 6:00 p.m. The average daily load pattern for May mirrors the summer load shape, although at a lower magnitude.

By contrast, the average daily load shape for a typical winter month includes two peak periods – one in the morning and another in the early evening. The load typically ramps up at 6:00 a.m. and falls off after 9:00 a.m. Afternoon load picks up at 6:00 p.m. and falls off after 9:00 p.m. Winter load during the afternoon and early evening, which is the peak period for May, is relatively very moderate.

Figure 2 Total Retail – Average Daily Load Shape
(MW per Hour, Average 2003-2004)



Actual load data 2003 - 2004

The average daily usage patterns for May, winter and summer can also be assessed by comparing the amount of energy that is consumed during the on-peak period, which is 9:00 a.m. to 9:00 p.m. weekdays. As shown in Table 1, for residential customers the on-peak consumption is typically 40.1% of the total monthly energy consumption for the month of May, averaged for 2003 through 2004. This is very consistent with the on-peak consumption for the average summer month, which is 41.3% of total monthly consumption. By contrast, the on-peak consumption is 34.7% of total consumption for the average winter month, which is significantly lower than May. The load shape and on-

peak usage information is important because it represents the behavior and energy consumption patterns underlying the monthly consumption.

Table 1. Residential On-Peak Energy Consumption
(% of total monthly consumption)

	May	Summer (May-Oct)	Winter (Nov-Apr)
2004	39.4%	41.1%	35.3%
2003	41.1%	41.4%	34.0%
Average	40.1%	41.3%	34.7%

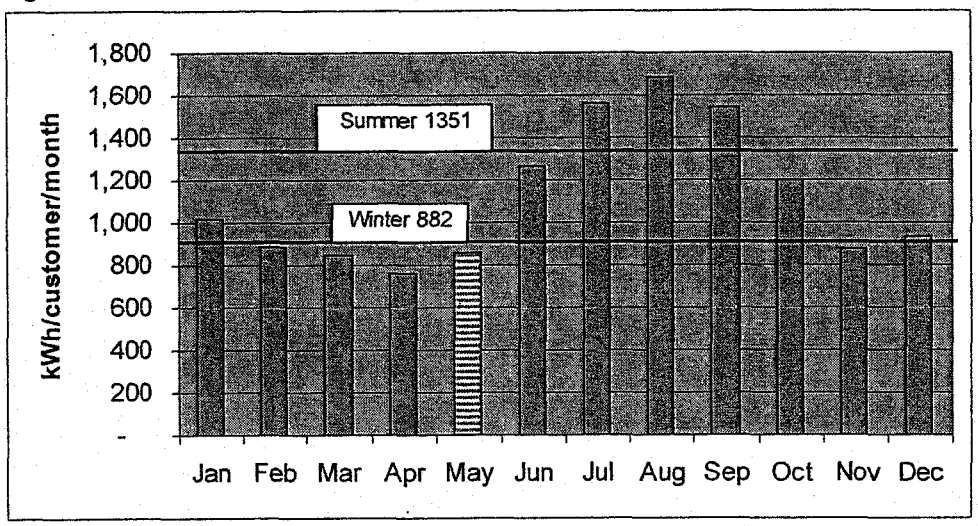
Load research data 2003 - 2004.

Monthly Usage per Customer by Customer Class

In the next step of the analysis, the monthly billed usage per customer is compared for May, winter, and summer for several customer classes. Figures 3a, 3b and 3c show the typical monthly energy usage per customer for residential, small general service, and medium general service customers respectively. The small general service data consists of customers on the Rate Schedule E-32 with maximum peak demands ranging from 0 to 100 kW. The medium general service data consists of customers on the E32 rate with maximum peak demands ranging from 101 to 1,000 kW. All of the information is based on actual billed usage for the years 2003 to 2004.

As shown in Figure 3a, the typical residential usage for the month of May was 855 kWh per customer over the period 2003 to 2004. By comparison, the average usage for the six summer months (May – October) was 1,351 kWh per customer over the same period. The average monthly usage for the tested new winter season (November – May) was 882 kWh per customer. The average usage for May was lower than both the summer and winter seasonal averages but much closer to the winter average.

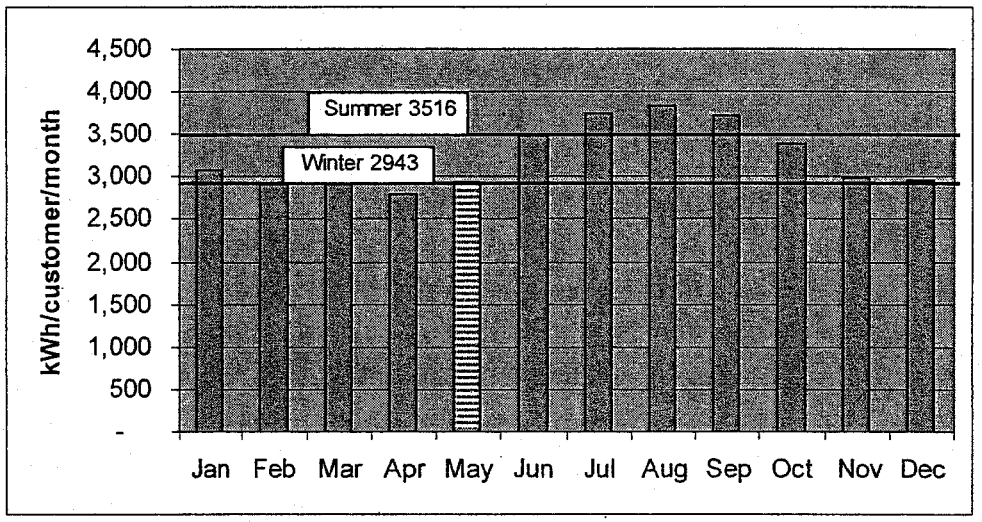
Figure 3a Residential Monthly kWh Usage per Customer



Actual monthly usage data 2003 – 2004

For small general service customers on the Schedule E-32, the average usage in May was 2,948 kWh per customer. As shown in Figure 3b, the average usage for the six summer months (May – October) was 3,516 kWh per customer over the same period. The average monthly usage for the tested new winter season (November – May) was 2,943 kWh per customer. The average usage for May was between the summer and winter seasonal averages, but closer to the winter average.

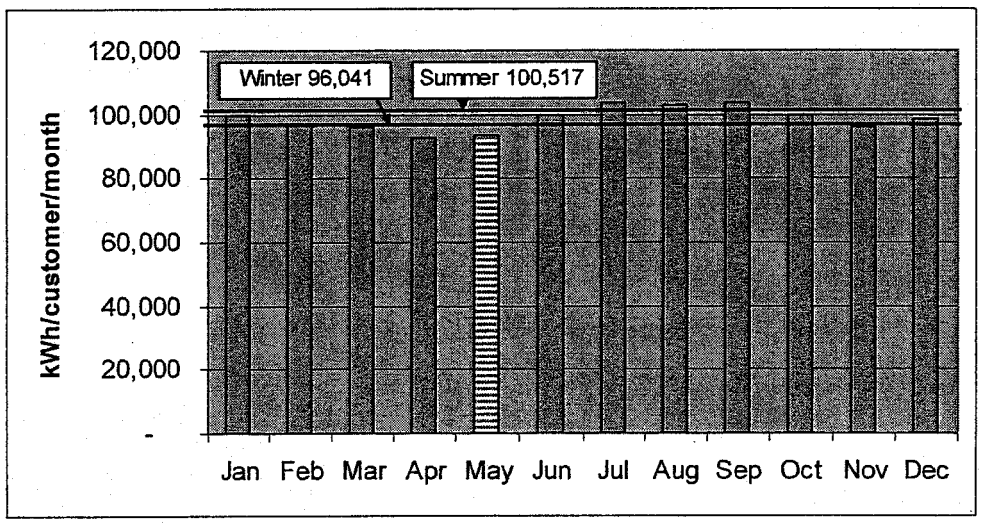
Figure 3b Small General Service (E32, 0-100 kW)
Monthly kWh Usage per Customer



Actual monthly usage data 2003 - 2004

For medium general service customers on Schedule E-32 with maximum demands between 101 and 1000 kW, the average usage in May was 93,192 kWh per customer over the period 2003 through 2004. As shown in Figure 3b, the average usage for the six summer months (May – October) was 100,517 kWh per customer over the same period. The average monthly usage for the tested new winter season (November – May) was 96,041 kWh per customer. The average usage for May was below both the summer and winter seasonal averages, but closer to the winter average.

Figure 3c Medium General Service (E32, 101-1000 kW)
Monthly kWh Usage per Customer



Actual monthly usage data 2003 - 2004

Early Versus Late Billing Cycles

As discussed above, APS reads meters and bills customers throughout the month, scheduled by billing cycle. Accordingly, customers who are billed earlier in May would have a greater amount of energy in their May bill that was actually consumed in April. The reverse is true for customers who are billed later in May. As a result, a winter seasonal estimate of May usage could be more reflective for customers in the earlier billing cycles in May. However, this benefit is reduced for customers in the latter cycles. For example, while the billing schedule changes slightly each year, a customer on cycle 1 would typically have their meter read on or about May 1 and billed around May 4. Assuming that the typical bill contains usage from the previous 30 days, this customer's May bill would generally reflect usage that occurred in April. Conversely, a customer on cycle 21 would typically have their meter read on or about May 30 and billed around June 2. In this case, the customer's May meter read would reflect usage that generally occurred in May.

This impact is demonstrated by the data in Tables 2 and 3. Table 2 displays total retail daily MWh for select weeks in April and May, averaged for 2003 and 2004. As shown the daily usage for the week of May 22 through May 28 was 29% higher than the daily usage for the period April 10 through April 16. This information indicates that usage in the latter part of May is significantly higher than usage in April and early May.

Table 3 further supports this point by showing the average daily MWh load for the 30 day period ending in various weeks in May. The information uses total retail load for the period 2003 through 2004. For example, as shown, the average daily consumption for the 30 day period ending May 28 is 15% higher than that for the period ending May 7.

Table 2. Total Retail Load 2003 – 2004
Average daily MWh per week

	Avg daily MWh	Delta from week 1
April 10-April 16	55,319	0.0%
April 17-April 23	53,845	-2.7%
April 24-April 30	58,475	5.7%
May 1-May 7	62,088	12.2%
May 8-May14	63,049	14.0%
May 15-May 21	69,564	25.8%
May 22-May 28	71,387	29.0%

Actual load data 2002-2003

Table 3. Total Retail Load 2003 – 2004
Average Daily MWh per 30 day period

	Avg daily MWh	Delta from week 1
30 days ending May 7	57,325	0.0%
30 days ending May 14	59,159	3.2%
30 days ending May 21	62,745	9.5%
30 days ending May 28	65,907	15.0%

Actual load data 2002-2003

Impact of Changing May to a Winter Month on Energy Estimates for Other Months
One of the potential unintended consequences of switching May to a winter month for bill estimation is that it will impact the kWh estimates for other months as well. This is because the new winter and summer seasonal energy estimates would be based on a new mix of months. Summer energy estimates would be based on the months June through October, compared with the current method which uses May through October.

As shown in Tables 4a, 4b and 4c, the proposed summer seasonal monthly energy estimate would likely be higher than the estimate from the current method. For example, for residential customers the current method results in average monthly energy usage of 1351 for summer months over the period 2003 through 2004. If May were excluded from the summer season, the resulting average summer monthly estimate would be 1450 over the same period. As a result, in the example presented, the estimates for July, August and September are higher but more representative under the proposed new method, while the estimates for June and October would be less representative.

The winter monthly energy estimates are less affected from including May in calculation. This is because the average usage for May was relatively close to the winter seasonal average value. Therefore, the average winter value does not change significantly whether May was included or not. For example, for residential customers the average winter usage was 886 kWh per customer per month using the current estimation method, which excludes May from the winter season. The value was 882 kWh under the proposed estimation method, which includes May in the winter season. Similar results hold for the small and medium size Schedule E-32 customers, as shown in Tables 4a, 4b, and 4c.

The improvement in representative usage for estimating May energy usage from the winter value versus the summer value is most dramatic for residential customers, less so for medium commercial customers. However, this is somewhat expected since the medium commercial customers have a more consistent monthly usage throughout the year.

Table 4a. Residential kWh per Customer per Month, 2003-2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	1,021	883	844	765	855	1,266	1,558	1,686	1,542	1,200	874	932
current estimate	886	886	886	886	1,351	1,351	1,351	1,351	1,351	1,351	886	886
delta	(135)	4	43	121	496	85	(207)	(335)	(190)	151	12	(45)
proposed estimate	882	882	882	882	882	1,450	1,450	1,450	1,450	1,450	882	882
delta	(139)	(1)	38	117	27	185	(108)	(235)	(91)	250	8	(50)

Table 4b. Small General Service kWh per Customer per Month, 2003-2004
E32 Customers with Maximum Demands (0-100 kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	3,089	2,921	2,911	2,792	2,948	3,472	3,732	3,843	3,716	3,387	2,974	2,964
current estimate	2,942	2,942	2,942	2,942	3,516	3,516	3,516	3,516	3,516	3,516	2,942	2,942
delta	(147)	21	31	149	568	44	(216)	(326)	(200)	130	(32)	(22)
proposed estimate	2,943	2,943	2,943	2,943	2,943	3,630	3,630	3,630	3,630	3,630	2,943	2,943
delta	(146)	22	32	150	(6)	158	(102)	(213)	(86)	243	(31)	(21)

Table 4c. Medium General Service kWh per Customer per Month, 2003-2004
E32 Customers with Maximum Demands (101-1000 kW)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual	99,744	96,493	95,755	92,845	93,192	99,867	103,458	103,172	103,760	99,652	95,699	98,557
current estimate	96,516	96,516	96,516	96,516	100,517	100,517	100,517	100,517	100,517	100,517	96,516	96,516
delta	(3,228)	22	760	3,670	7,325	650	(2,942)	(2,655)	(3,244)	865	817	(2,042)
proposed estimate	96,041	96,041	96,041	96,041	96,041	101,982	101,982	101,982	101,982	101,982	96,041	96,041
delta	(3,703)	(452)	286	3,195	2,849	2,115	(1,477)	(1,190)	(1,779)	2,330	342	(2,516)

Impact of Change on the Estimation of May Load when Seasonal Data is not Available

One of the considerations for switching May to the winter season for bill estimation purposes is that it would also change the estimated monthly energy for May when historic seasonal consumption values are not available for a customer. That is, currently when historic seasonal data is not available, May is estimated using the customer's monthly usage in May of the previous year. This is because the previous month, April, is in another season. If May was switched to the winter season, the customer's April consumption, which would now be in the same season, would be used to estimate May usage in this circumstance. As shown in the Figures 3a, 3b and 3c average energy consumption in April is typically lower than May, especially for residential and small commercial customers. Therefore, switching May to the winter season would likely result in less accurate estimates of monthly consumption for May when seasonal account information is not available.

Conclusion

Based on the analysis described above, it appears that shifting May to a winter basis for bill estimating purposes will improve the reasonableness of bill estimates for customers who are billed early in the meter reading billing cycle. However, estimates made for consumption billed in the latter part of the month of May would not be significantly impacted on average either way by the change to a winter season. Implementing a switch of May to the winter for purposes of estimating kWh will require a change to Schedule 8, presently pending approval from the Commission.