Conservation Effect of Replacing Xcel Southwestern Public Service Company's Residential Flat Rate in New Mexico with an Inverted Block Tariff

Report Submitted to Xcel Southwestern Public Service Company for its New Mexico Service Area

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1. Introduction and overview

In May 2010, Southwestern Public Service (SPS) Company retained Frontier Associates and Energy and Environmental Economics Inc. (E3) to estimate the conservation effect of replacing SPS's existing residential flat rate design with a two-tier inverted block rate design. The conservation estimates presented below aim to aid SPS's compliance with the Final Order and Settlement Agreement in docket number 08-00354-UT.

A two-tier inverted block rate design has a relatively low tier-1 rate that applies to a residential customer's monthly consumption below the tier-1 block (e.g., 500 kWh per month) and a relatively high tier-2 rate that applies to consumption above the tier-1 block. Each design considered herein is revenue-neutral, collecting the same total rate class revenue as the flat design in the absence of customer price response. Thus, the inverted block tariff's tier-1 (tier-2) rate is necessarily lower (higher) than the existing flat rate. A small user with consumption below the inverted block tariff's tier-1 block would see a marginal rate decrease when compared to the flat rate. A large user with consumption above the tier-1 block would see a marginal rate increase when compared to the flat rate.

Our estimation assumes that a residential customer responds to a marginal electricity rate change caused by the rate design switch. Thus, a conservation effect at the rate class level would occur if the consumption increase by small users seeing the relatively low tier-1 rate is more than offset by the consumption reduction by large users seeing the relatively high tier-2 rate.

Based on monthly billing data in 2008 provided by SPS and alternative assumptions on customer price responsiveness (i.e., price elasticity), a plausible range of conservation effects (as a percent of total annual sales) is as follows: (a) Schedule 1017: 0.87% - 5.4%; (b) Schedule 1018: 0.82% - 5.3%; and (c) Schedule 1021: 0.84% - 5.4%.

The remainder of the report proceeds as follows: Section 2 describes our approach, Section 3 documents the input data and assumptions, and Sections 4 and 5 present the results. Finally, an appendix details the conservation calculations.

2. Approach

2.1 Conservation estimation

Figure 1 portrays the conservation effect of replacing a flat rate design with an inverted block design. In this figure, there are two downward sloping demand curves: (a) a small user whose consumption is below the tier-1 block *B*, and (b) a large user whose consumption is above *B*. Because the tier-1 rate P_1 is lower than the original flat rate P_0, the small user increases consumption from q_0 to q_1. However, the large user reduces consumption Q_0 to Q_1, in response to the marginal rate increase from P_0 to P_2. When the smaller user's consumption increase is less than the larger user's consumption reduction, the overall kWh effect is conservation, a decrease in the total sales to the two users.

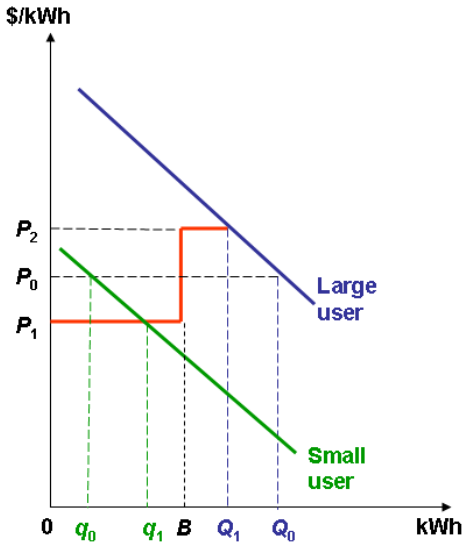

Figure 1. The conservation effect induced by inverted block rates

Our conservation estimation entails the following steps:

- *Step 1: Compute the total kWh revenue to be collected by a new design for a given rate schedule.* Each rate class' yearly revenue is the sum of the total monthly kWh sales at the applicable rates.

- *Step 2: Use SPS historic billing data to determine seasonal tier-1 block size.* Guided by the inverted block design of SPS's neighboring utility PNM, we set alternative tier-1 block sizes using SPS's calendarized 2008 monthly billing data.[1] PNM's tariff has two blocks of 200 and 700 kWh,[2] with an average tier size of 450 kWh. PNM customers' average monthly use is approximately 600 kWh,[3] thus a 450-kWh block represents 75% of the average consumption. Following the ratio of consumption to tier size employed by PNM, a low and a high tier-1 block for our inverted block designs may be set at 75% and 100% of the median monthly consumption by season (summer: June - September; and winter: remaining months).

- *Step 3: Set tier-2 rates by season based on SPS's seasonal avoided costs.* The tier-2 rates are set to track SPS's avoided costs due to conservation.[4] These costs equal the sum of avoided energy and capacity costs. Marginal avoided energy costs are based on the natural gas futures price and the heat rate of a combustion turbine (CT) in SPS's resource plan. The summer tier-2 rates are set at the summer avoided capacity cost, equal to the annual marginal capacity cost divided by an assumed

[1] The 2009 data are not used due to the severe recession in 2009 and measurement inaccuracy for the month of July.

[2] Public Service Company of New Mexico, 18th Revised Rate No. 1a, New Mexico Public Regulation Commission, Filed on January 22, 2010.

[3] Public Service Company of New Mexico, News Release, "New PNM Electric Rates Will Be Phased In Beginning July 1," May 28, 2009. http://www.pnm.com/news/2009/0528_rates_approved.htm

[4] Adam Pollock and Evgenia Shumilkina, "How to Induce Customers to Consume Energy Efficiency: Rate Design Options and Methods," National Regulatory Research Institute, January 2010, pp. 6-8.

number of hours during which the CT would likely run.[5] The winter tier-2 rates are found by scaling the summer tier-2 rates using a factor based on the current seasonal tariffs.

- *Step 4: Solve tier-1 rates by season that will collect the same revenue found in Step 1, assuming no customer price response.* Using the yearly revenue computed in Step 1 and the tier-2 rate determined in Step 3, the tier-1 rate is residually solved to yield the same revenue produced by the current rates. This is done by first determining the revenue from the kWh sold at the tier-2 rate. The tier-1 rate is then found as (a) the difference between the total revenue under the flat rate and the revenue from kWh sales at the tier-2 rate, divided by (b) the remaining kWh sales that would be subject to the tier-1 rate.

- S*tep 5: Find the total seasonal sales by usage size.* This entails finding the total sales to small users, which is the total kWh for customer-months in a given season that have usage below the tier-1 block. The seasonal total sales to large users is the difference between the class' seasonal total sales and the seasonal total sales to small users.

- *Step 6: Apply price elasticity formula to compute the change in monthly consumption.* The percentage change in total seasonal sales to small users is assumed to be (a) the percentage change in the marginal rate for these users, multiplied by a price elasticity value (b). An elasticity of -0.1 implies that a 1% increase in the price of electricity will lead to a 0.1% reduction in kWh consumption. The percentage change in total seasonal sales to large users is computed in the same manner.

[5] From Craig Berg direct testimony, 2009 SPS Energy Efficiency Plan, Case No. 08-0333-UT.

- *Step 7: Find the kWh sales changes by season and usage size*. For a given season, the total kWh change for smaller users is the percentage change sales for these users found in Step 6 multiplied by the total kWh sales to these users. The calculation for large users is identical.

- *Step 8: Find the new design's conservation effect.* The class-specific total MWh conservation effect is the annual total sales change, which can be divided by the current rate class total sales to show the percentage sales change due to the rate design replacement.

3. Data

3.1 Existing rate schedules

Table 1 reports the current seasonal SPS flat rates by rate class: Class 1017 (space heating), 1018 (lighting), and 1021 (water heating). In addition to these per kWh rates, there is a fixed charge of $5.60 per customer-month. A monthly charge of the same amount is also applied in the inverted block tariff design.

Table 1. Existing SPS Rate Schedules - Eighth Revised Rate No. 1, made effective on July 15, 2009 by the New Mexico Public Regulation Commission

Schedule	**Winter flat rate ($/kWh)**	**Summer flat rate ($/kWh)**
1017 (Space heating)	0.069906	0.089096
1018 (Lighting)	0.085866	0.089096
1021 (Water heating)	0.081516	0.089096

3.2 Historic monthly billing data by schedule

Figures 2-4 display the distributions of customer-specific consumption by month for each schedule using 2008 monthly billing data. The distributions for all three rate classes are fairly symmetric, allowing the tier-1 size determination to be based on the mean or median value.

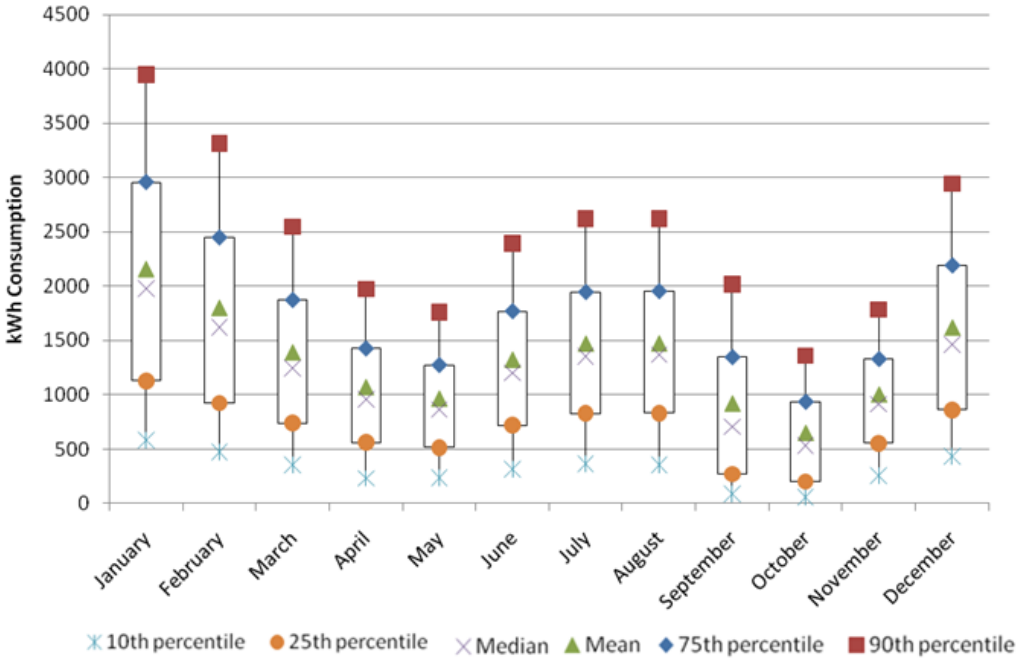

Figure 2. Consumption distribution for Schedule 1017

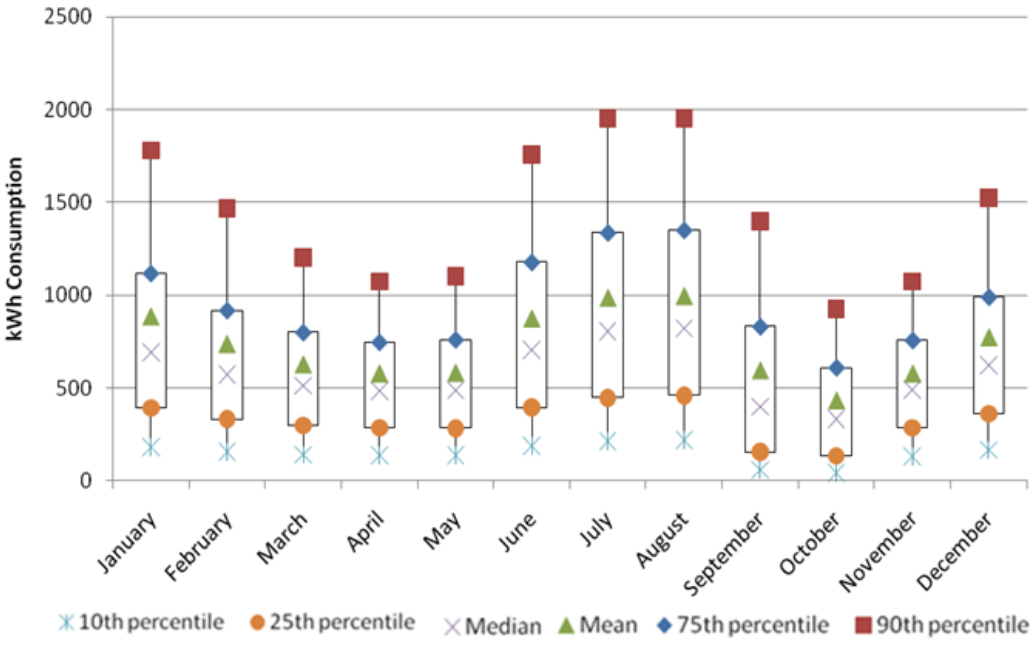

Figure 3. Consumption distribution for Schedule 1018

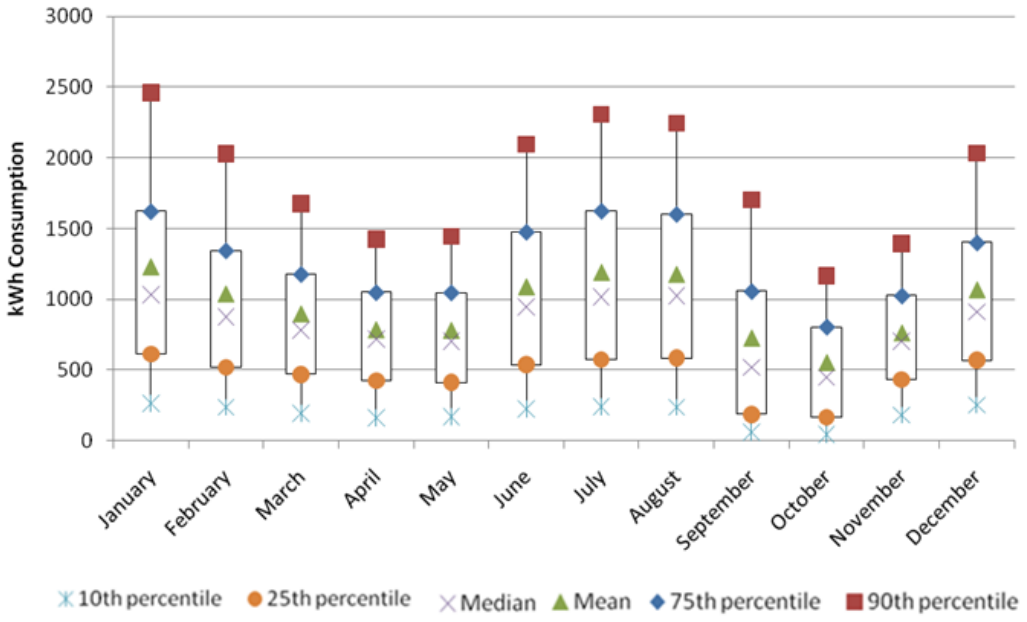

Figure 4. Consumption distribution for Schedule 1021

3.3 Avoided costs by season

Avoided costs are calculated as the sum of the energy costs and capacity costs that are avoided by 1 kWh of conservation. Energy costs are determined by (a) the 7.5 MMBtu/MWh heat rate of a generic combustion turbine (CT) plant in SPS's New Mexico generation portfolio,[6] multiplied by (b) the NYMEX natural gas futures price for 2012 summer delivery of $5.30/MMBTU.[7] The energy costs are thus calculated as $0.03975/kWh.

The avoided capacity costs are based on the $150/kW-year cost of a generic CT plant.[8] A high and a low capacity cost estimate are found by varying the peak operating interval and capacity factor. Shown in Table 2, the total avoided cost estimates are approximately $0.13/kWh and $0.11/kWh.

Table 2. Avoided cost assumptions

Capacity cost assumption	**Capacity factor**	**Peak interval**	**Avoided capacity cost**	**Avoided energy cost**	**Total avoided cost**
High	10%	6-hours/day	$0.092/kWh	$0.03975/kWh	$0.13175/kWh
Low	15%	8-hours/day	$0.0692/kWh	$0.03975/kWh	$0.10895/kWh

Note: Avoided capacity cost per summer peak kWh = Annual capacity cost of 150/kW-year * Summer allocation factor of 0.9 / Number of summer peak hours (= peak interval per day * number of summer peak days).

[6] From Craig Berg direct testimony, 2009 Energy Efficiency Plan, Case No. 08-0333-UT

[7] CME Group, Henry Hub Natural Gas Look-Alike Last Day Financial Futures http://www.cmegroup.com/trading/energy/natural-gas/natural-gas-last-day.html

[8] Southwestern Public Service Company, Summary of SPS Portfolio Avoided Capacity Costs, Excel spreadsheet, 2008.

3.4 Tier-2 rates by season

Shown in Table 3 below, the summer tier-2 rates are set at the summer avoided costs. The winter rates are set to reflect the ratio of the current winter to summer flat rate.

Table 3. Tier-2 rates ($/kWh) by schedule and season

Schedule	Winter		Summer	
	Low	High	Low	High
1017 (Space heating)	0.084981	0.10277	0.10895	0.13175
1018 (Lighting)	0.10459	0.12648	0.10895	0.13175
1021 (Water heating)	0.11989	0.099145	0.10895	0.13175

3.5 Price elasticity assumption

Assuming that small and large users are equally price-responsive, Table 4.A presents the price elasticity estimates used in this report. While there has been no definitive study of price elasticity of demand for SPS's service territory, a plausible range can be assumed for the following reasons:

- Two electricity demand surveys report elasticity estimates that range from -0.0004 to -2.01.[9] These estimates are so widely disperse that they are of little use for our conservation estimation purpose.
- A 2005 Rand Report finds low price responsiveness (about -0.05) for Arizona and Texas and zero price responsiveness for New Mexico,[10] the empirical basis for our chosen range in Table 4.A.

[9] Carol Dahl and Carlos Roman, "Energy Demand Elasticities – Fact or Fiction: A Survey Update," 2004, pp. 1-9; James A. Espey and Molly Espey, "Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities," *Journal of Agricultural and Applied Economics*, April 2004, Vol. 36, No. 1, pp. 65-81.

- Using price elasticity estimates with a large size unsupported by empirical evidence can lead to unrealistic conservation estimates.

Table 4.A. Range of equal elasticity values by user type

User type	Low	Mid	High
Small user with monthly consumption below tier-1 block	-0.05	-0.1	-0.15
Large user with monthly consumption above tier-1 block	-0.05	-0.1	-0.15

We also use Table 4.B below to compute the conservation estimates. This table assumes that small users are less price-sensitive than large users because small users have less room for conservation than large users. It enables a test of whether the conservation estimates are sensitive to the small users' price elasticity assumption.

Table 4.B. Range of unequal elasticity values by user type

User type	Low	Mid	High
Small user with monthly consumption below tier-1 block	-0.025	-0.05	-0.075
Large user with monthly consumption above tier-1 block	-0.05	-0.1	-0.15

[10] Mark A. Bernstein and James Griffin, Regional Differences in the Price-Elasticity of Demand For Energy. Rand Corporation, 2005, p.82.

4. Detailed results under the assumption of equal elasticity values in Table 4.A

This section presents the revenue-neutral two-tier inverted block rate designs and describes the associated MWh change by season and usage size, as well as the overall conservation effects. For completeness, it also shows the annual bill changes due to the new rate designs for four customers with monthly consumption 200 kWh, 600 kWh, 1000 kWh and 1400 kWh.

4.1 Schedule 1017

4.1.1 Alternative revenue-neutral inverted block designs

Table 5 shows four alternative inverted block rate designs for Schedule 1017 (space heating) based on the first four steps in the conservation estimation process described in Section 2. Designs A and B have a tier-1 block size equal to approximately 75% of median monthly usage. However, Design A uses the low total avoided cost as the tier-2 rate, while B the high cost. Design C and D have a tier-1 block size equal to the median monthly usage. Design C uses low total avoided cost as the tier-2 rate, and D the high cost. Finally, the winter rates are found by scaling the summer rates to match the existing ratio of summer to winter rate.

Table 5. Tier-1 block sizes and rates for Schedule 1017

Design ID	**Tier-1 block size (kWh)**		**Tier-1 rate ($/kWh)**		**Tier-2 rate ($/kWh)**	
	Summer	**Winter**	**Summer**	**Winter**	**Summer**	**Winter**
A	900	900	0.07392	0.0580	0.10895	0.084981
B	900	900	0.05619	0.04409	0.13175	0.102765
C	1200	1200	0.08022	0.06294	0.10895	0.084981
D	1200	1200	0.06985	0.07474	0.05481	0.102765

4.1.2 Conservation effects by design and price elasticity

Figures 5-8 show the results of applying the last four steps of the conservation estimation process in Section 2 to find the conservation effect of a new revenue-neutral two-tier inverted block rate design. The MWh change estimates are delineated by season, price elasticity, and customer usage size. Even though small users increase their consumption, the overall effect of the tariff design switch is a MWh decrease, because of the consumption reduction by large users.

Figure 9 combines the MWh changes of small and large users by season to yield the overall annual conservation by elasticity and design. Figure 10 shows that these MWh estimates are about 0.87% - 5.4% of total class sales.

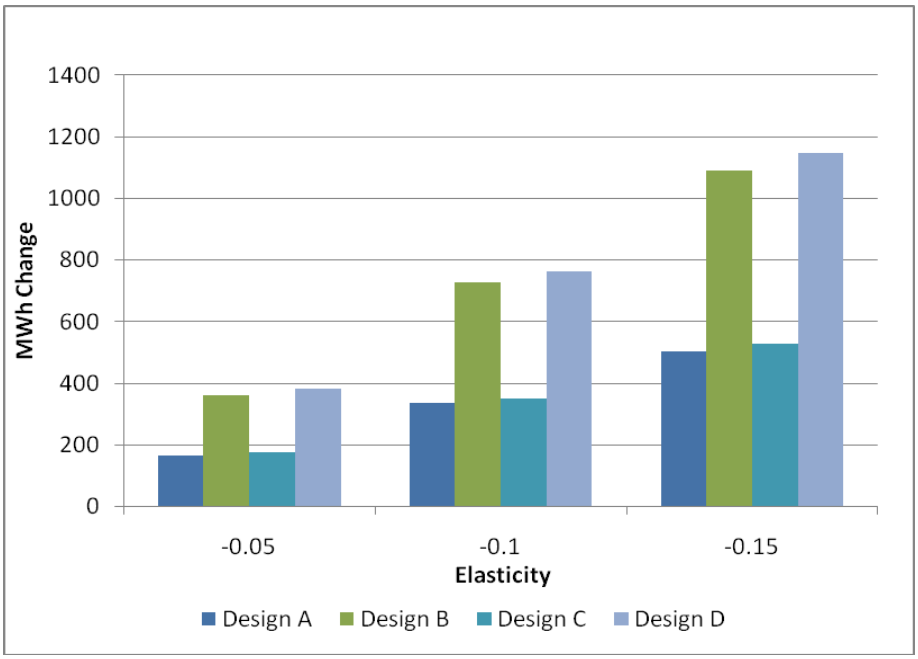

Figure 5. Summer consumption change for small customers in Schedule 1017

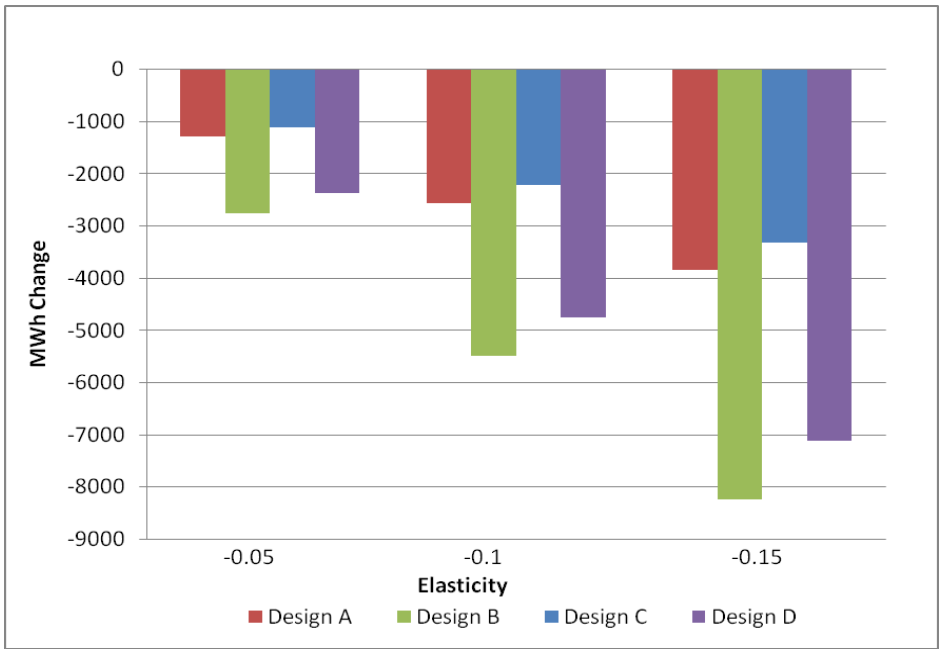

Figure 6. Summer consumption change for large customers in Schedule 1017

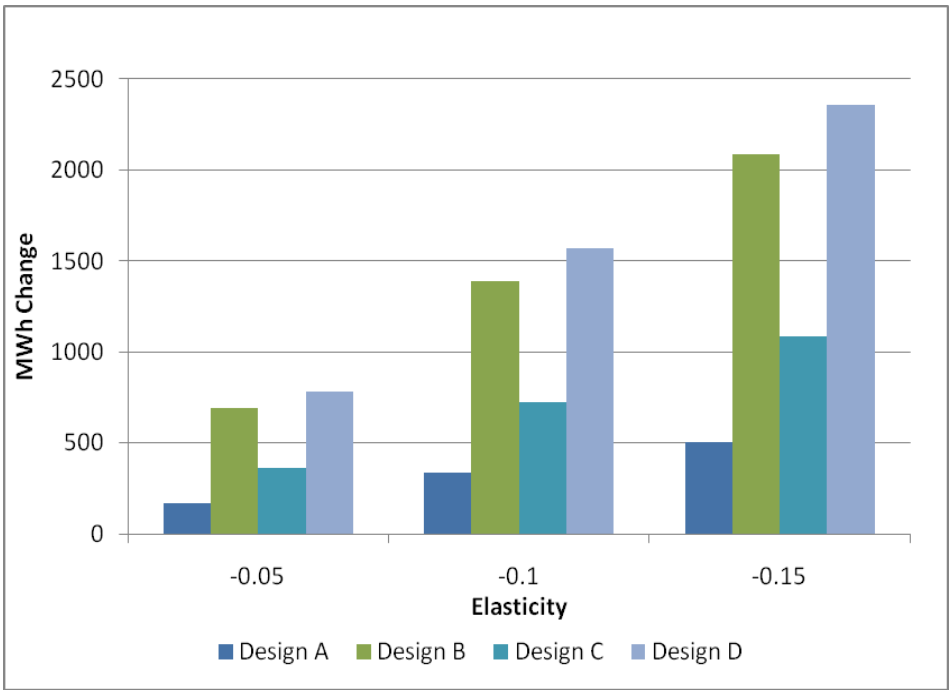

Figure 7. Winter consumption change for small customers in Schedule 1017

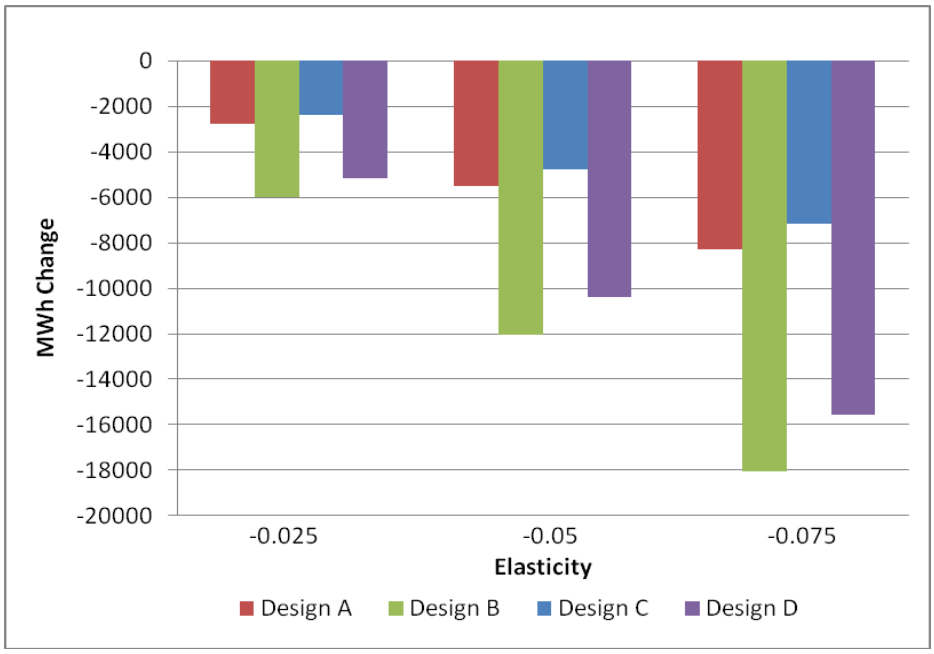

Figure 8. Winter consumption change for large customers in Schedule 1017

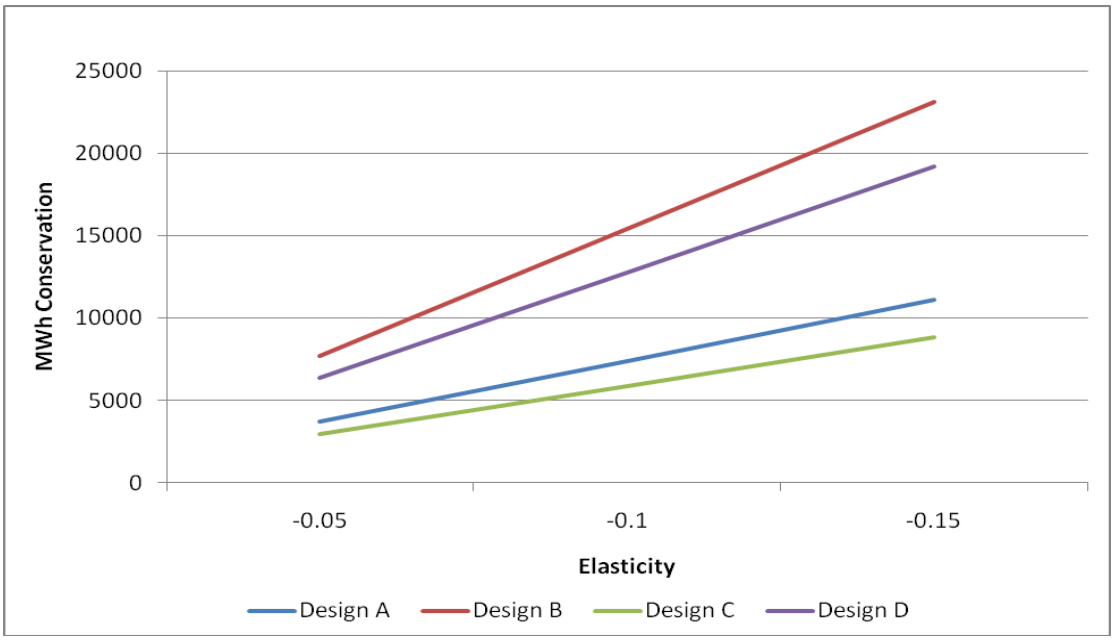

Figure 9. Total annual conservation (= net consumption decrease) for all customers in Schedule 1017[11]

[11] The conservation effect calculation results depicts in Figures 5-22, along with the percent consumption change for small and large users, can be found tabulated in Appendix A.

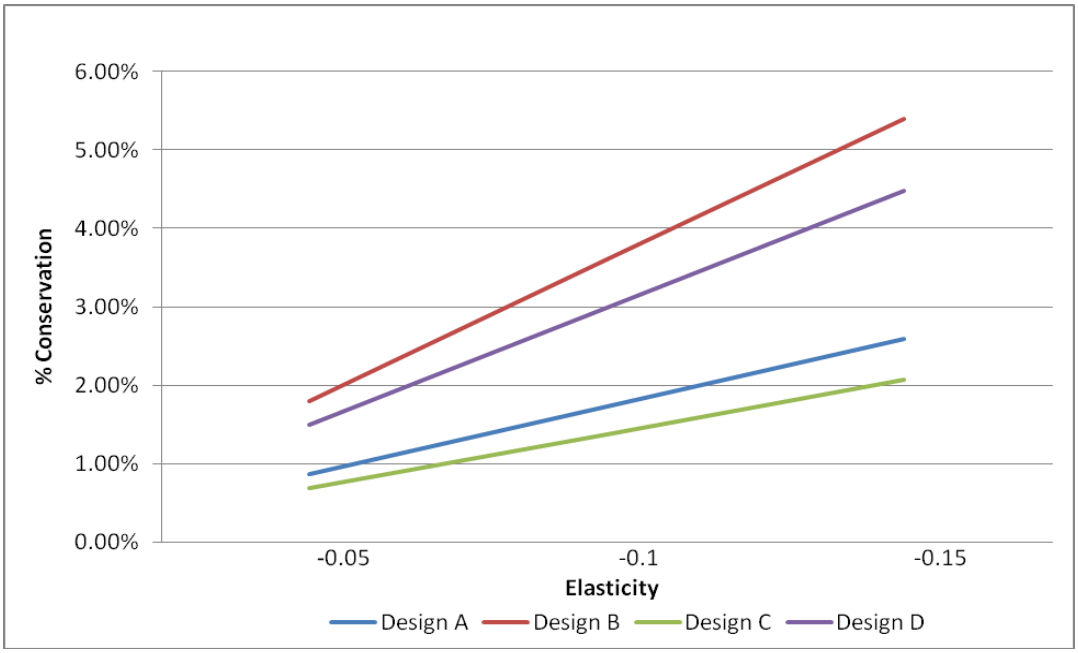

Figure 10. Total annual percent conservation in Schedule 1017

4.1.3 Bill impacts by customer size

Table 6 displays the annual bill impact for four customers with different monthly consumption for each of the design schemes. A negative (positive) number indicates a bill reduction (increase). Due to the effect of the tier-2 price signal, large users experience the greatest increase in bill amount, while small users, subject to the tier-1 rate, see a bill reduction.

Table 6. Bill impact ($) by customer size and season for Schedule 1017

Design ID	Monthly kWh consumption							
	200		600		1000		1400	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-12.14	-19.05	-36.42	-57.15	30.07	-73.66	92.54	-25.42
B	-26.32	-41.31	-78.97	-123.92	-24.64	-159.59	16.34	-54.44
C	-7.10	-11.15	-21.30	-33.44	41.26	-55.73	80.74	-42.75
D	-15.40	-24.15	-46.19	-72.46	-0.22	-120.77	49.21	-92.35

Table 7 depicts each customer's bill impact as a percent of the customer's bill. A negative percent value points to a bill decrease, while a positive value indicates a bill increase.

Table 7. Percent bill impact by customer size and season for Schedule 1017

Design ID	Monthly kWh consumption							
	200		600		1000		1400	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-17.03%	-17.03%	-17.03%	-17.03%	8.44%	-13.17%	18.55%	-3.25%
B	-36.93%	-36.93%	-36.93%	-36.93%	-6.91%	-28.54%	3.28%	-6.95%
C	-9.96%	-9.96%	-9.96%	-9.96%	11.58%	-9.96%	16.18%	-5.46%
D	-21.60%	-21.59%	-21.60%	-21.59%	-0.06%	-21.59%	9.86%	-11.79%

4.2 Schedule 1018

4.2.1 Alternative revenue-neutral inverted block designs

Table 8 shows the alternative rate designs for Schedule 1018 (lighting). The tier-1 block sizes are smaller than those for Schedule 1017 (space heating) because Schedule 1018 customers have lower consumption than Schedule 1017 customers.

Table 8. Tier-1 block size and rates for Schedule 1018

Design ID	**Tier-1 block size (kWh)**		**Tier-1 rate ($/kWh)**		**Tier-2 rate ($/kWh)**	
	Summer	**Winter**	**Summer**	**Winter**	**Summer**	**Winter**
A	600	400	0.07143	0.06884	0.10895	0.104592
B	600	400	0.05091	0.04906	0.13175	0.12648
C	750	600	0.0762	0.07906	0.10895	0.104592
D	750	600	0.06742	0.06497	0.13175	0.12648

4.2.2 Conservation effects by design and price elasticity

Figures 11-14 show the conservation estimate by season, price elasticity, and customer usage size. As was the case for Schedule 1017, small users consume more and large users less after the rate design switch. Figure 15 combines the consumption changes of small and large users by season to yield the overall annual conservation by elasticity and design. Figure 16 shows that these MWh conservation estimates are about 0.82% - 5.3% of total class sales.

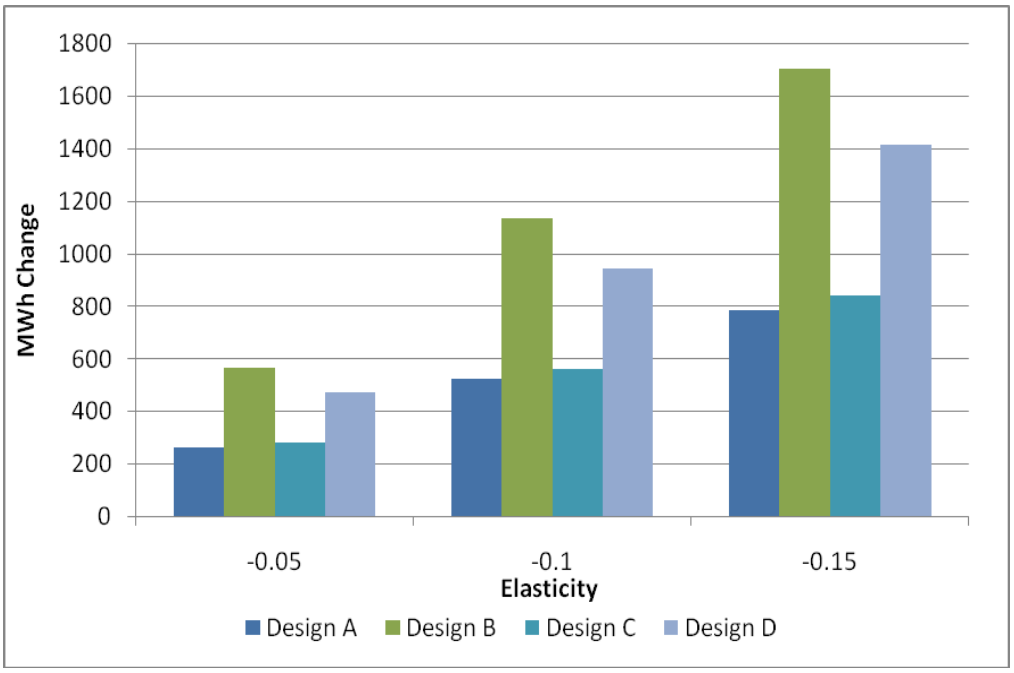

Figure 11. Summer consumption increase for small customers in Schedule 1018

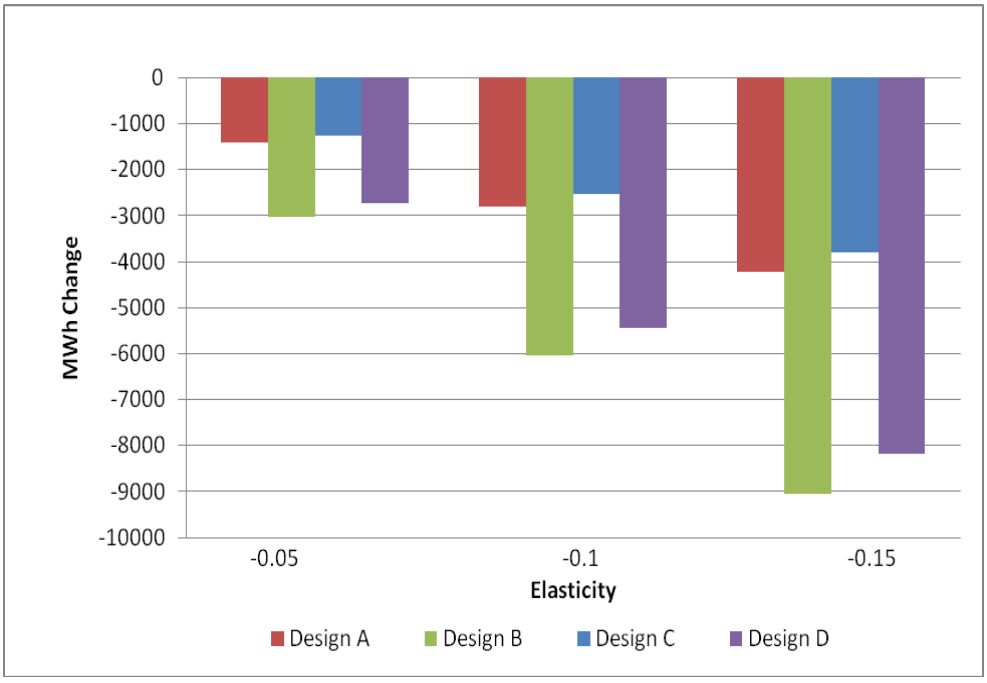

Figure 12. Summer consumption decrease for large customers in Schedule 1018

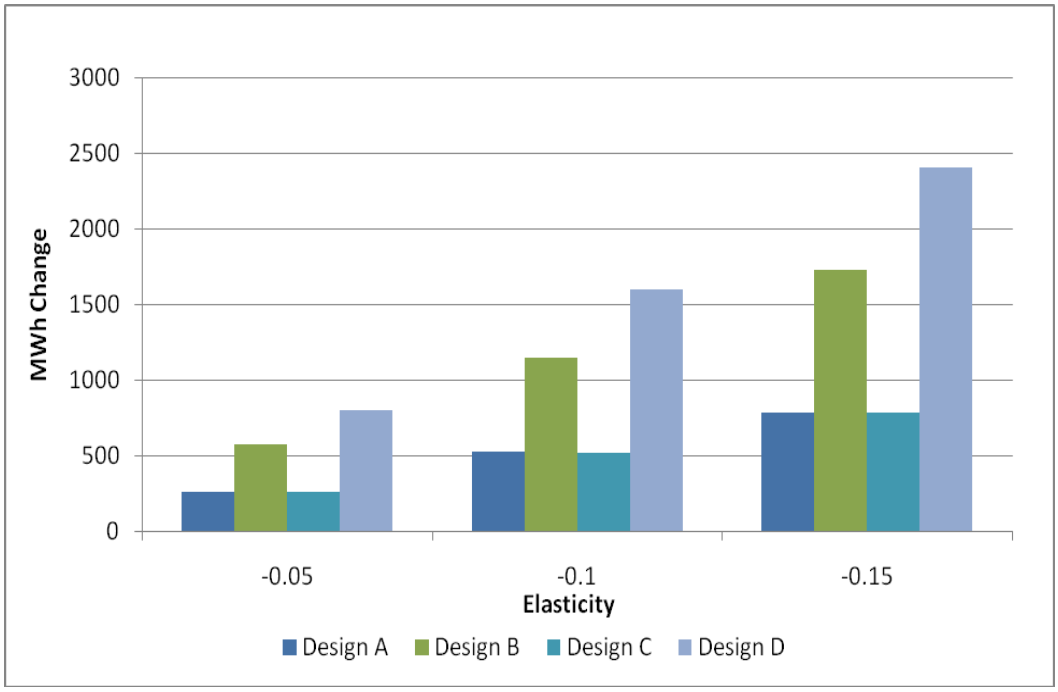

Figure 13. Winter consumption increase for small customers in Schedule 1018

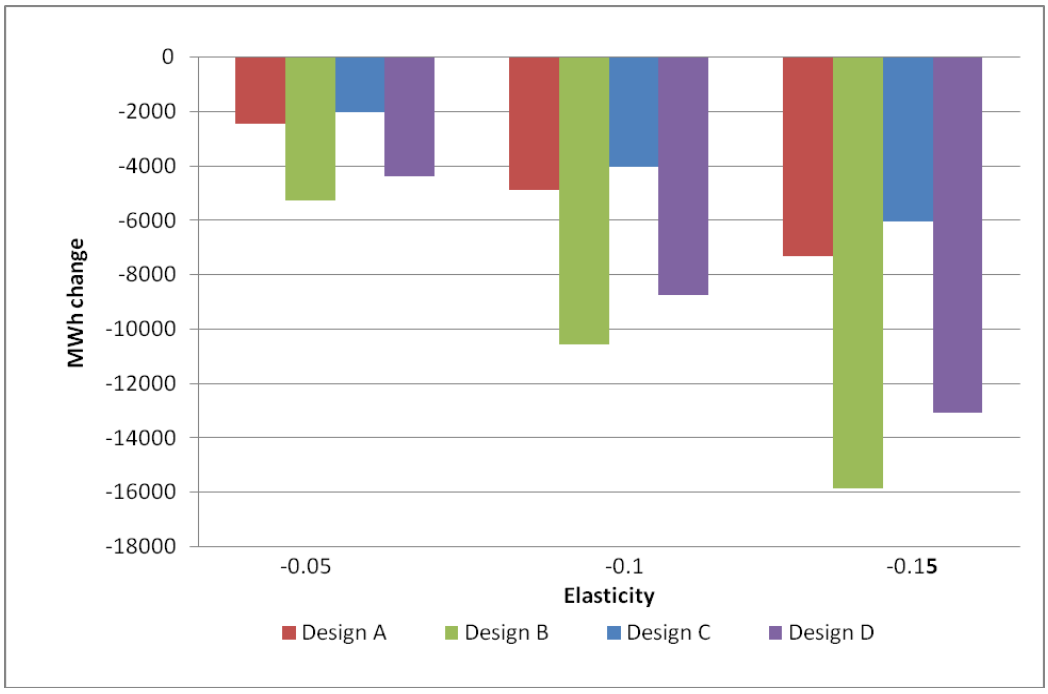

Figure 14. Winter consumption decrease for large customers in Schedule 1018

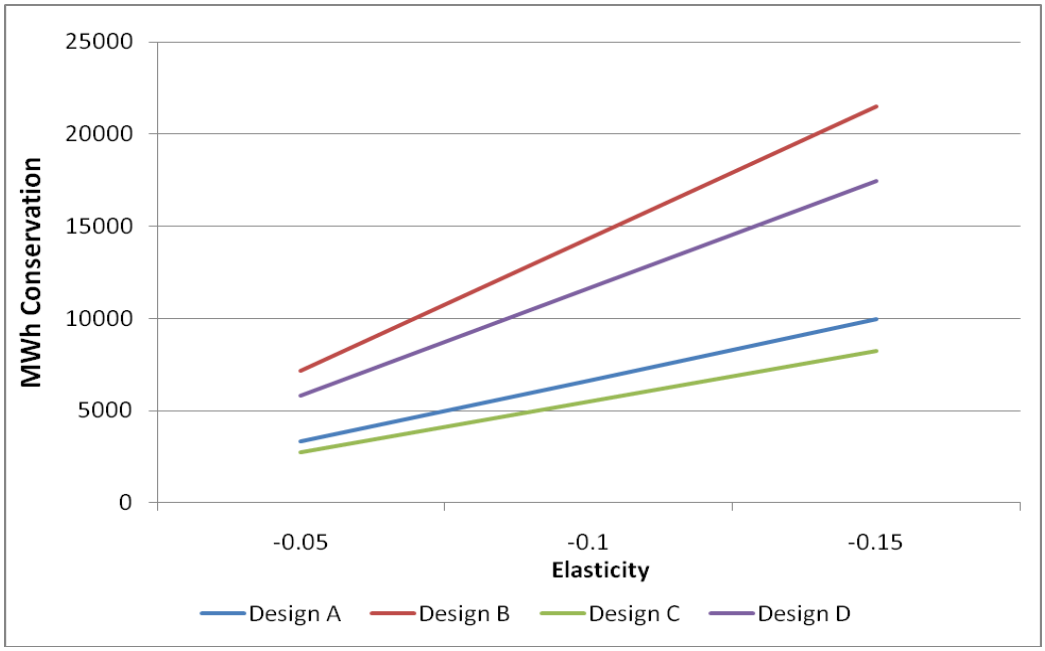

Figure 15. Total annual conservation effect for all customers in Schedule 1018

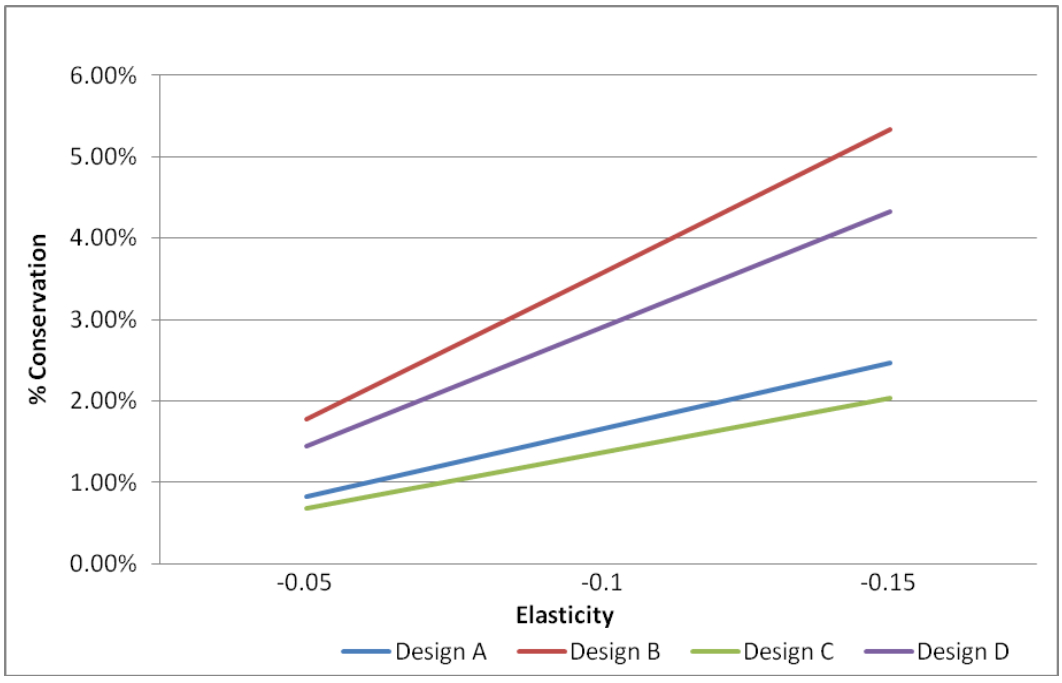

Figure 16. Total annual percent conservation in Schedule 1018

4.2.3 Bill impacts by customer size

Table 9 displays the seasonal bill impact for customers with different monthly consumption. Table 10 depicts these bill impacts as percentage changes in customer bills. As expected, small users see a bill reduction, while large users see a bill increase.

Table 9. Bill impact ($) by customer size and season for Schedule 1018

Design ID	**Monthly kWh consumption**							
	200		**600**		**1000**		**1400**	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-14.13	-27.24	-42.40	-24.52	-10.63	35.40	39.22	95.32
B	-30.55	-58.89	-91.65	-52.80	-23.40	77.17	46.07	207.13
C	-10.32	-10.89	-30.95	-32.67	-18.83	27.25	31.02	87.18
D	-17.34	-33.43	-52.02	-100.30	-22.37	29.66	63.96	159.63

Table 10. Percent bill impact by customer size and season for Schedule 1018

Design ID	**Monthly kWh consumption**							
	200		**600**		**1000**		**1400**	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-19.83%	-19.83%	-19.83%	-5.95%	-2.98%	5.15%	4.24%	9.91%
B	-42.86%	-42.86%	-42.86%	-12.81%	-6.57%	11.23%	5.61%	21.54%
C	-14.47%	-7.93%	-14.47%	-7.93%	-5.28%	-3.97%	2.59%	9.06%
D	-24.33%	-24.34%	-24.33%	-24.34%	-6.28%	-4.32%	9.19%	16.60%

4.3 Schedule 1021

4.3.1 Alternative revenue-neutral inverted block designs

Table 11 shows the results of applying the first four steps of the conservation estimation process in Section 2 to the monthly billing data and seasonal flat rates of Schedule 1021. The tier-1 block sizes are large than those for Schedule 1018 (lighting) because Schedule 1021 customers have higher consumption than Schedule 1018 customers.

Table 11. Tier-1 block size and rates for Schedule 1021

Design ID	**tier-1 block size (kWh)**		**tier-1 rate ($/kWh)**		**tier-2 rate ($/kWh)**	
	Summer	**Winter**	**Summer**	**Winter**	**Summer**	**Winter**
A	750	600	0.07389	0.0676	0.10895	0.099145
B	750	600	0.05615	0.0537	0.13175	0.119893
C	900	750	0.07864	0.07195	0.10895	0.099145
D	900	750	0.06645	0.0608	0.13175	0.119893

4.3.2 Conservation effects by design and price elasticity

Figures 17-20 below show the results of applying the last four steps of the conservation estimation process in Section 2 to find the conservation effect of a new revenue-neutral two-tier inverted block rate design for Schedule 1021. The results confirm that small users increase their consumption while large users reduce their consumption. Summarized in Figure 21, the net conservation impact combines the consumption changes of small and large users by season. Figure 22 shows that these conservation estimates are about 0.84% - 5.4% of total class sales.

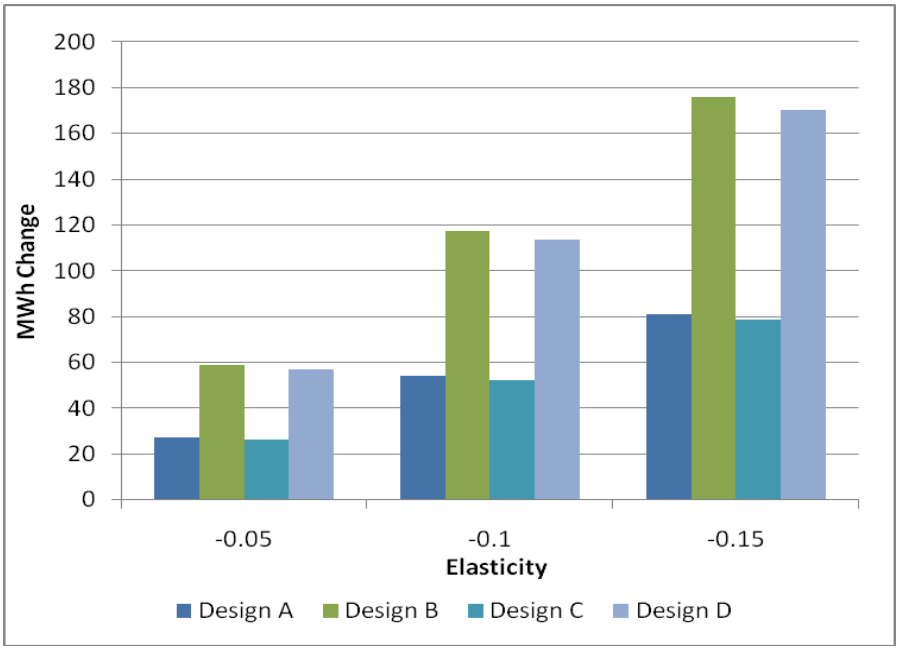

Figure 17. Summer consumption increase for small customers in Schedule 1021

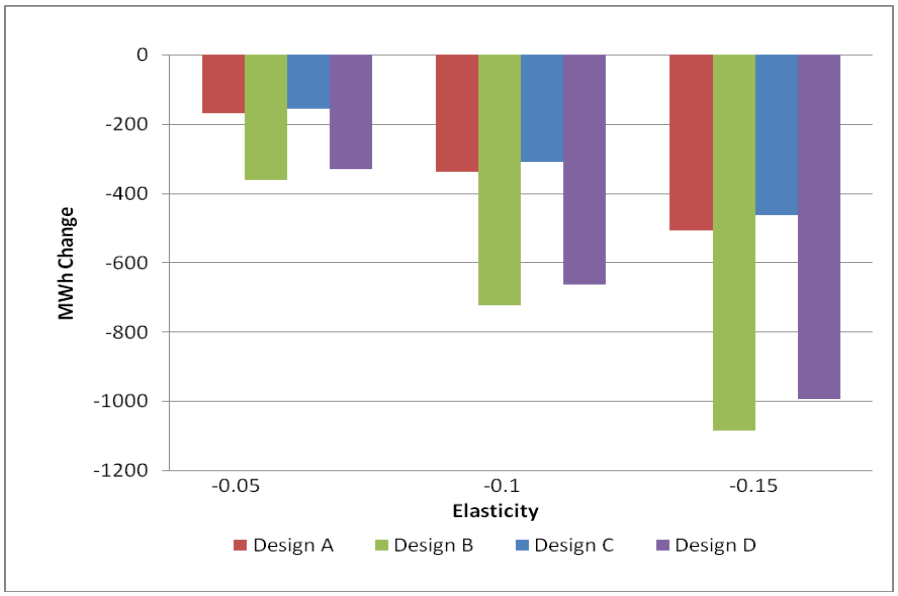

Figure 18. Summer consumption decrease for large customers in Schedule 1021

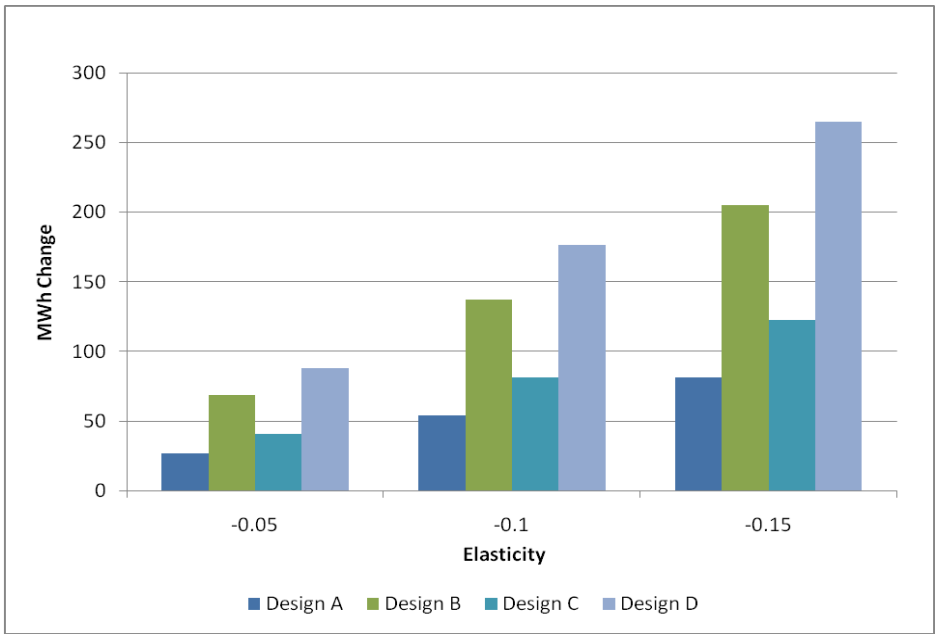

Figure 19. Winter consumption increase for small customers in Schedule 1021

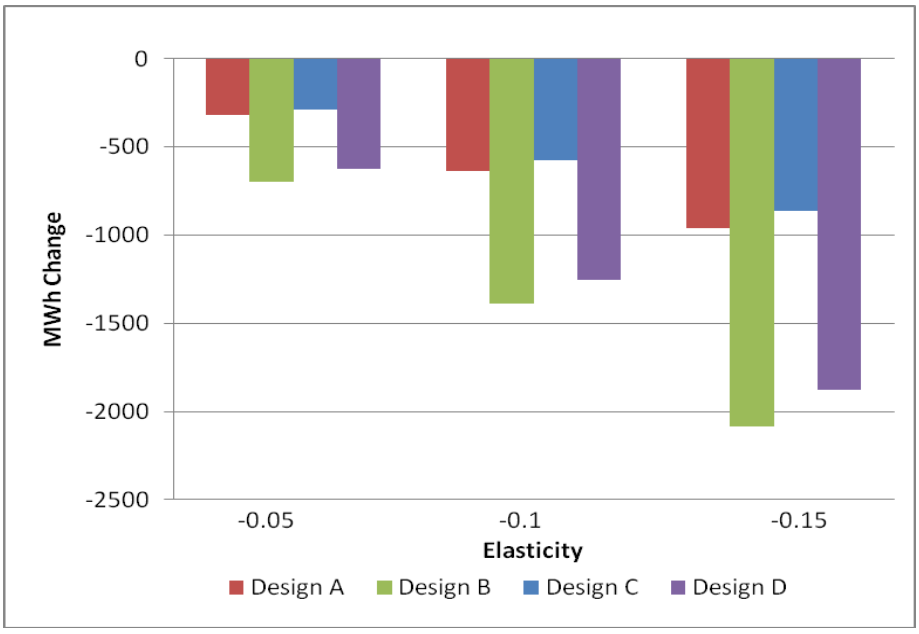

Figure 20. Winter consumption decrease for large customers in Schedule 1021

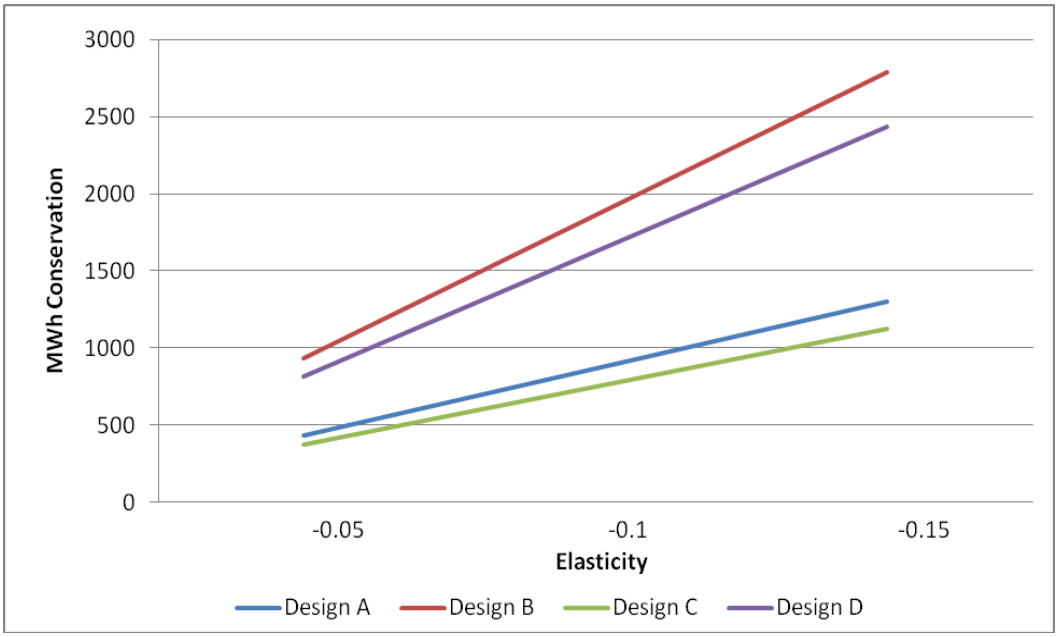

Figure 21. Total annual conservation effect for all customers in Schedule 1021

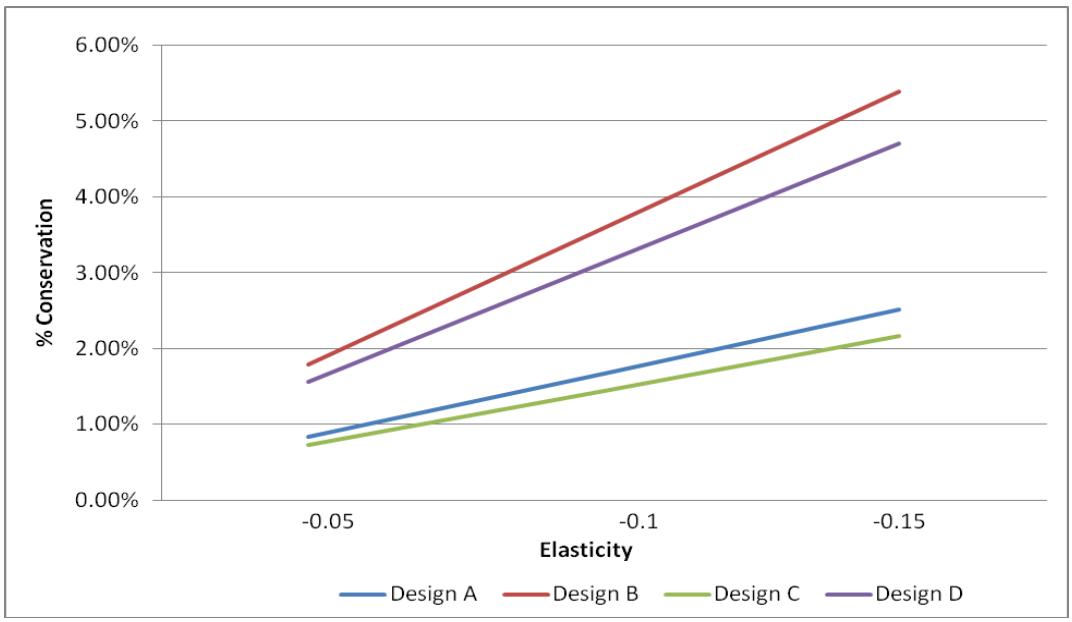

Figure 22. Total annual percent conservation in Schedule 1021

4.3.3 Bill impacts by customer size

Tables 12 and 13 display the seasonal bill impacts for customers with different monthly consumption for each of the design schemes for Schedule 1021.

Table 12. Bill impact ($) by customer size and season for Schedule 1018

Design ID	**Monthly kWh consumption**							
	200		**600**		**1000**		**1400**	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-12.16	-22.27	-36.49	-66.80	-25.76	-10.39	48.45	46.03
B	-26.36	-44.51	-79.07	-133.52	-56.18	-10.71	23.68	112.09
C	-8.36	-15.31	-25.09	-45.92	-29.70	-22.14	44.51	34.27
D	-18.12	-33.15	-54.35	-99.44	-64.46	10.07	46.23	75.26

Table 13 depicts the percent bill impact per month for each customer consumption range for each inverted block design by season.

Table 13. Percent bill impact by customer size and season for Schedule 1021

Design ID	**Monthly kWh consumption**							
	200		**600**		**1000**		**1400**	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
A	-17.07%	-17.07%	-17.07%	-17.07%	1.28%	-1.59%	9.71%	5.04%
B	-36.98%	-34.12%	-36.98%	-34.12%	-7.26%	-1.64%	10.93%	12.28%
C	-11.74%	-11.74%	-11.74%	-11.74%	0.17%	-3.39%	8.92%	3.75%
D	-25.42%	-25.41%	-25.42%	-25.41%	-9.58%	1.54%	9.27%	8.24%

5. Conservation estimates under the assumption of unequal elasticity values in Table 4.B

To test if the conservation estimates in Section 4 are sensitive to the elasticity assumption for small users, we repeat the conservation estimation using the unequal price elasticity values in Table 4.B. Figures 23-25 portray the revised conservation estimates (as percent of total class sales) for the three schedules, indicating that the conservation estimates in Section 4 are not highly sensitive to the assumption of small users' price elasticity.

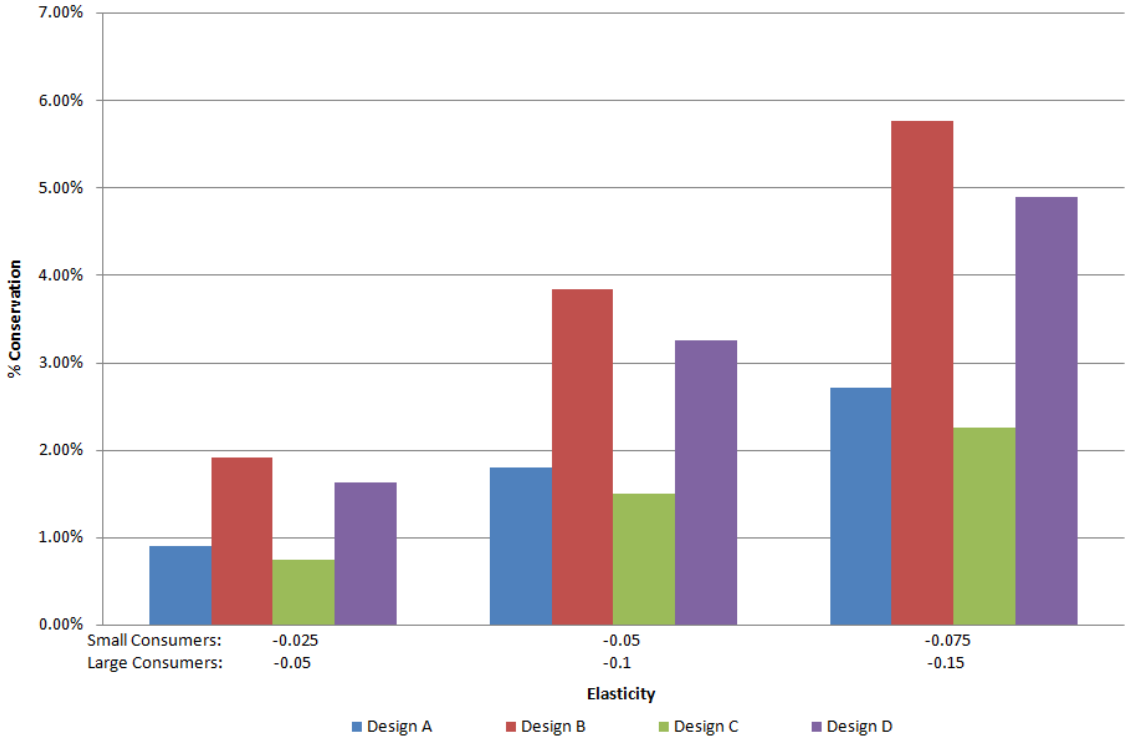

Figure 23. Annual conservation as a percent of total sales for Schedule 1017

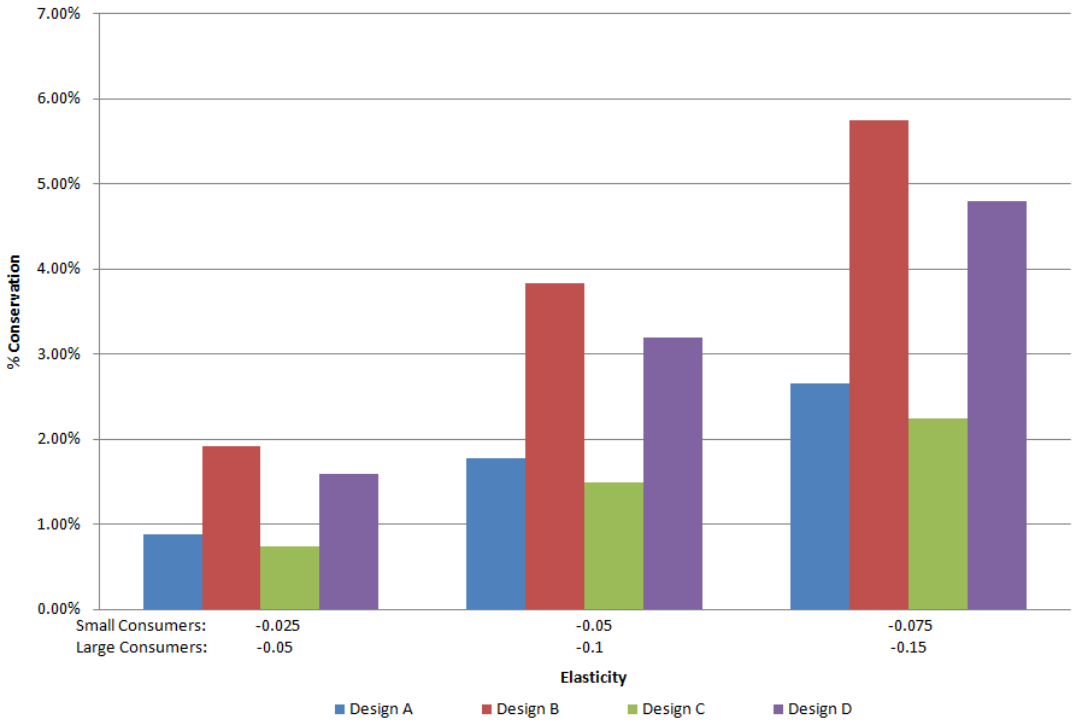

Figure 24. Annual conservation as a percent of total sales for Schedule 1018

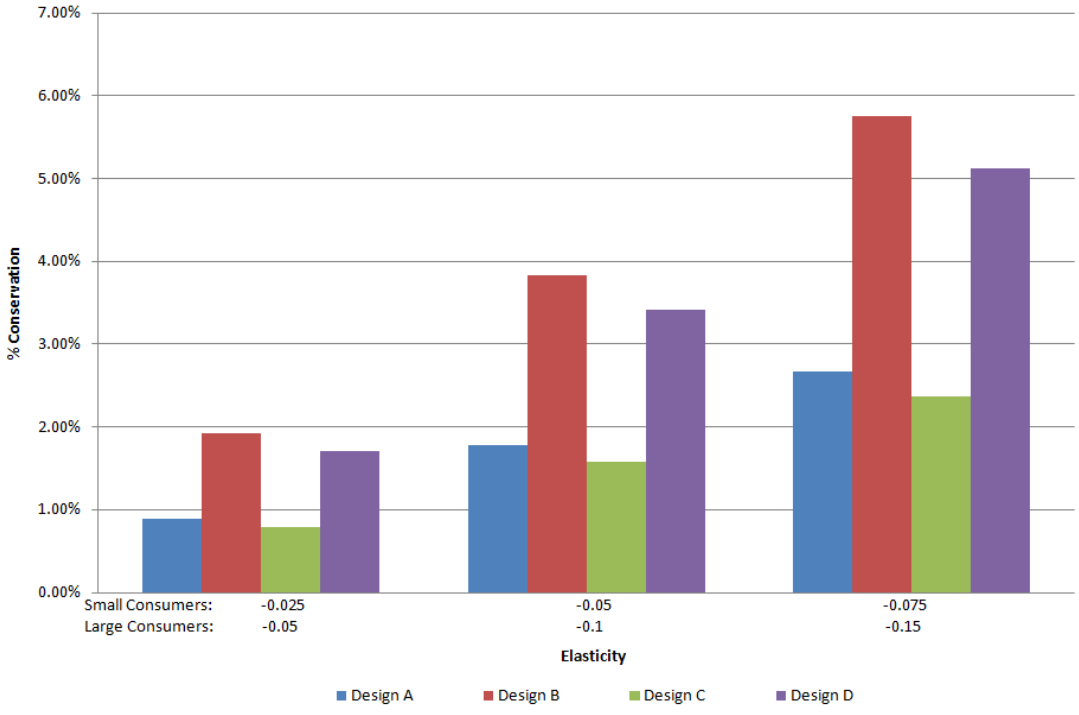

Figure 25. Annual conservation as a percent of total sales for Schedule 1021

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Appendix: Conservation calculations that yield the detailed results under the assumption of equal elasticity values in Table 4.A

Summer conservation data for Schedule 1017

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	19676.41	167.57	0.85%	4.42	114777.7	-1278.84	-1.1%	-19.86	134454.11	-1111.27
2		-0.1	19676.41	335.15	1.70%	8.84	114777.7	-2557.68	-2.2%	-39.71	134454.11	-2222.53
3		-0.15	19676.41	502.73	2.55%	13.2	114777.7	-3836.53	-3.3%	-59.57	134454.11	-3333.8
4	B	-0.5	19676.41	363.35	1.85%	9.58	114777.7	-2747.44	-2.4%	-42.66	134454.11	-2384.09
5		-0.1	19676.41	726.71	3.69%	19.1	114777.7	-5494.89	-4.8%	-85.32	134454.11	-4768.18
6		-0.15	19676.41	1090.0	5.54%	28.7	114777.7	-8242.33	-7.2%	-127.98	134454.11	-7152.27
7	C	-0.05	35379.28	176.22	0.50%	3.33	99074.9	-1103.88	-1.1%	-22.34	134454.19	-927.655
8		-0.1	35379.28	352.45	1.00%	6.66	99074.9	-2207.76	-2.2%	-44.67	134454.19	-1855.31
9		-0.15	35379.28	528.68	1.49%	9.99	99074.9	-3311.64	-3.3%	-67.01	134454.19	-2782.96
10	D	-0.05	35379.28	382.12	1.08%	7.22	99074.9	-2371.56	-2.4%	-47.99	134454.19	-1989.44
11		-0.1	35379.28	764.24	2.16%	14.4	99074.9	-4743.13	-4.8%	-95.98	134454.19	-3978.89
12		-0.15	35379.28	1146.36	3.24%	21.6	99074.9	-7114.69	-7.2%	-143.96	134454.19	-5968.33

Winter conservation data for Schedule 1017

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	37631.18	167.55	0.45%	2.5275	255906.15	-2759.27	-1.1%	-19.95	293537.34	-2591.71
2		-0.1	37631.18	335.11	0.89%	5.0549	255906.15	-5518.53	-2.2%	-39.90	293537.34	-5183.41
3		-0.15	37631.18	502.67	1.34%	7.5824	255906.15	-8277.80	-3.2%	-59.84	293537.34	-7775.12
4	B	-0.05	37631.18	694.85	1.85%	10.4812	255906.15	-6014.38	-2.4%	-43.48	293537.34	-5319.52
5		-0.1	37631.18	1389.7	3.69%	20.9624	255906.15	-12028.75	-4.7%	-86.96	293537.34	-10639
6		-0.15	37631.18	2084.5	5.54%	31.4436	255906.15	-18043.13	-7.1%	-130.44	293537.34	-15958.6
7	C	-0.05	72693.12	362.18	0.50%	3.6295	220844.12	-2381.22	-1.1%	-22.72	293537.25	-2019.03
8		-0.1	72693.12	724.37	1.00%	7.2590	220844.12	-4762.43	-2.2%	-45.43	293537.25	-4038.06
9		-0.15	72693.12	1086.5	1.49%	10.8886	220844.12	-7143.65	-3.2%	-68.15	293537.25	-6057.09
10	D	-0.05	72693.12	784.89	1.08%	7.8655	220844.12	-5190.34	-2.4%	-49.51	293537.25	-4405.45
11		-0.1	72693.12	1569.7	2.16%	15.7311	220844.12	-10380.68	-4.7%	-99.03	293537.25	-8810.89
12		-0.15	72693.12	2354.6	3.24%	23.5966	220844.12	-15571.02	-7.1%	-148.54	293537.25	-13216.3

Annual conservation data for Schedule 1017

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A - Low	-0.05	57307.60	335.14	0.6%	3.22	370683.86	-4038.11	-1.1%	-19.92	427991.46	-3702.97
2		-0.1	57307.60	670.27	1.2%	6.43	370683.86	-8076.22	-2.2%	-39.84	427991.46	-7405.95
3		-0.15	57307.60	1005.41	1.8%	9.65	370683.86	-12114.33	-3.3%	-59.76	427991.46	-11108.9
4	B	-0.05	57307.60	1058.21	1.8%	10.16	370683.86	-8761.82	-2.4%	-43.22	427991.46	-7703.61
5		-0.1	57307.60	2116.42	3.7%	20.31	370683.86	-17523.64	-4.7%	-86.44	427991.46	-15407.2
6		-0.15	57307.60	3174.63	5.5%	30.47	370683.86	-26285.47	-7.1%	-129.66	427991.46	-23110.8
7	C	-0.05	108072.41	538.42	0.5%	3.53	319919.03	-3485.10	-1.1%	-22.59	427991.44	-2946.68
8		-0.1	108072.41	1076.83	1.0%	7.05	319919.03	-6970.20	-2.2%	-45.19	427991.44	-5893.37
9		-0.15	108072.41	1615.25	1.5%	10.58	319919.03	-10455.30	-3.3%	-67.78	427991.44	-8840.05
10	D	-0.05	108072.41	1167.01	1.1%	7.64	319919.03	-7561.91	-2.4%	-49.02	427991.44	-6394.89
11		-0.1	108072.41	2334.03	2.2%	15.29	319919.03	-15123.81	-4.7%	-98.05	427991.44	-12789.8
12		-0.15	108072.41	3501.04	3.2%	22.93	319919.03	-22685.72	-7.1%	-147.07	427991.44	-19184.7

Summer conservation data for Schedule 1018

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	26467.958	262.404	0.99%	3.16	126182.00	-1405.91	-1.1%	-14.27	152650	-1143.505
2		-0.1	26467.958	524.808	1.98%	6.31	126182.00	-2811.82	-2.2%	-28.55	152650	-2287.010
3		-0.15	26467.958	787.212	2.97%	9.47	126182.00	-4217.73	-3.3%	-42.82	152650	-3430.515
4	B	-0.05	26467.958	567.200	2.14%	6.82	126182.00	-3020.43	-2.4%	-30.67	152650	-2453.231
5		-0.1	26467.958	1134.400	4.29%	13.65	126182.00	-6040.86	-4.8%	-61.33	152650	-4906.462
6		-0.15	26467.958	1701.601	6.43%	20.47	126182.00	-9061.29	-7.2%	-92.00	152650	-7359.693
7	C	-0.05	38744.182	280.397	0.72%	2.77	113905.99	-1269.13	-1.1%	-15.82	152650.2	-988.734
8		-0.1	38744.182	560.794	1.45%	5.53	113905.99	-2538.26	-2.2%	-31.63	152650.2	-1977.468
9		-0.15	38744.182	841.191	2.17%	8.30	113905.99	-3807.39	-3.3%	-47.45	152650.2	-2966.201
10	D	-0.05	38744.182	471.300	1.22%	4.65	113905.99	-2726.58	-2.4%	-33.98	152650.2	-2255.279
11		-0.1	38744.182	942.600	2.43%	9.30	113905.99	-5453.16	-4.8%	-67.96	152650.2	-4510.558
12		-0.15	38744.182	1413.900	3.65%	13.95	113905.99	-8179.74	-7.2%	-101.95	152650.2	-6765.838

Winter conservation data for Schedule 1018

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	26886.77	262.41	0.98%	2.281	223607.616	-2438.26	-1.1%	-9.82	250494.4	-2175.851
2		-0.1	26886.77	524.82	1.95%	4.563	223607.616	-4876.52	-2.2%	-19.65	250494.4	-4351.702
3		-0.15	26886.77	787.23	2.93%	6.844	223607.616	-7314.79	-3.3%	-29.47	250494.4	-6527.554
4	B	-0.05	26886.77	576.24	2.14%	5.010	223607.616	-5288.24	-2.4%	-21.30	250494.4	-4711.996
5		-0.1	26886.77	1152.49	4.29%	10.020	223607.616	-10576.5	-4.7%	-42.61	250494.4	-9423.992
6		-0.15	26886.77	1728.73	6.43%	15.030	223607.616	-15864.7	-7.1%	-63.91	250494.4	-14135.988
7	C	-0.05	65929.39	261.29	0.40%	1.351	184565.019	-2012.53	-1.1%	-11.85	250494.4	-1751.246
8		-0.1	65929.39	522.58	0.79%	2.701	184565.019	-4025.07	-2.2%	-23.71	250494.4	-3502.491
9		-0.15	65929.39	783.86	1.19%	4.052	184565.019	-6037.6	-3.3%	-35.56	250494.4	-5253.737
10	D	-0.05	65929.39	802.22	1.22%	4.147	184565.019	-4364.9	-2.4%	-25.71	250494.4	-3562.681
11		-0.1	65929.39	1604.43	2.43%	8.293	184565.019	-8729.79	-4.7%	-51.42	250494.4	-7125.362
12		-0.15	65929.39	2406.65	3.65%	12.440	184565.019	-13094.7	-7.1%	-77.13	250494.4	-10688.043

Annual conservation data for Schedule 1018

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	53354.73	524.81	1.0%	2.65	349789.62	-3844.17	-1.1%	-11.09	403144.3	-3319.36
2		-0.1	53354.73	1049.63	2.0%	5.30	349789.62	-7688.34	-2.2%	-22.18	403144.3	-6638.71
3		-0.15	53354.73	1574.44	3.0%	7.95	349789.62	-11532.5	-3.3%	-33.26	403144.3	-9958.07
4	B	-0.05	53354.73	1143.44	2.1%	5.77	349789.62	-8308.67	-2.4%	-23.96	403144.3	-7165.23
5		-0.1	53354.73	2286.89	4.3%	11.54	349789.62	-16617.3	-4.8%	-47.93	403144.3	-14330.45
6		-0.15	53354.73	3430.33	6.4%	17.31	349789.62	-24926	-7.1%	-71.89	403144.3	-21495.68
7	C	-0.05	104673.57	541.69	0.5%	1.84	298471.01	-3281.66	-1.1%	-13.13	403144.6	-2739.98
8		-0.1	104673.57	1083.37	1.0%	3.67	298471.01	-6563.33	-2.2%	-26.25	403144.6	-5479.96
9		-0.15	104673.57	1625.06	1.6%	5.51	298471.01	-9844.99	-3.3%	-39.38	403144.6	-8219.94
10	D	-0.05	104673.57	1273.52	1.2%	4.32	298471.01	-7091.48	-2.4%	-28.36	403144.6	-5817.96
11		-0.1	104673.57	2547.03	2.4%	8.64	298471.01	-14183	-4.8%	-56.73	403144.6	-11635.92
12		-0.15	104673.57	3820.55	3.6%	12.96	298471.01	-21274.4	-7.1%	-85.09	403144.6	-17453.88

Summer conservation data for Schedule 1021

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	3172.50	27.07	0.85%	3.549	15111.98	-168.38	-1.1%	-17.03	18284.49	-141.304
2		-0.1	3172.50	54.15	1.71%	7.097	15111.98	-336.75	-2.2%	-34.06	18284.49	-282.608
3		-0.15	3172.50	81.22	2.56%	10.646	15111.98	-505.13	-3.3%	-51.09	18284.49	-423.912
4	B	-0.05	3172.50	58.66	1.85%	7.689	15111.98	-361.74	-2.4%	-36.59	18284.49	-303.080
5		-0.1	3172.50	117.31	3.70%	15.377	15111.98	-723.47	-4.8%	-73.17	18284.49	-606.161
6		-0.15	3172.50	175.97	5.55%	23.066	15111.98	-1085.21	-7.2%	-109.76	18284.49	-909.241
7	C	-0.05	4467.25	26.21	0.59%	2.848	13817.19	-153.95	-1.1%	-18.52	18284.44	-127.737
8		-0.1	4467.25	52.43	1.17%	5.696	13817.19	-307.90	-2.2%	-37.04	18284.44	-255.474
9		-0.15	4467.25	78.64	1.76%	8.544	13817.19	-461.85	-3.3%	-55.56	18284.44	-383.211
10	D	-0.05	4467.25	56.77	1.27%	6.168	13817.19	-330.74	-2.4%	-39.79	18284.44	-273.970
11		-0.1	4467.25	113.55	2.54%	12.337	13817.19	-661.49	-4.8%	-79.58	18284.44	-547.940
12		-0.15	4467.25	170.32	3.81%	18.505	13817.19	-992.23	-7.2%	-119.37	18284.44	-821.911

Winter conservation data for Schedule 1021

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	4012.19	27.08	0.67%	2.483	29536.75	-319.38	-1.1%	-13.24	33548.95	-292.30
2		-0.1	4012.19	54.16	1.35%	4.967	29536.75	-638.76	-2.2%	-26.47	33548.95	-584.60
3		-0.15	4012.19	81.24	2.02%	7.450	29536.75	-958.13	-3.2%	-39.71	33548.95	-876.90
4	B	-0.05	4012.19	68.45	1.71%	6.278	29536.75	-695.27	-2.4%	-28.82	33548.95	-626.82
5		-0.1	4012.19	136.91	3.41%	12.556	29536.75	-1390.55	-4.7%	-57.63	33548.95	-1253.64
6		-0.15	4012.19	205.36	5.12%	18.834	29536.75	-2085.82	-7.1%	-86.45	33548.95	-1880.45
7	C	-0.05	6951.85	40.79	0.59%	2.673	26597.13	-287.59	-1.1%	-14.55	33548.98	-246.80
8		-0.1	6951.85	81.58	1.17%	5.346	26597.13	-575.18	-2.2%	-29.09	33548.98	-493.60
9		-0.15	6951.85	122.37	1.76%	8.019	26597.13	-862.78	-3.2%	-43.64	33548.98	-740.41
10	D	-0.05	6951.85	88.34	1.27%	5.789	26597.13	-626.08	-2.4%	-31.66	33548.98	-537.74
11		-0.1	6951.85	176.67	2.54%	11.577	26597.13	-1252.15	-4.7%	-63.33	33548.98	-1075.48
12		-0.15	6951.85	265.01	3.81%	17.366	26597.13	-1878.23	-7.1%	-94.99	33548.98	-1613.22

Annual conservation data for Schedule 1021

(a) Scenario	(b) Design	(c) Elasticity	(d) MWH sales for customer-months with monthly usage < tier 1 size	(e) MWH change for monthly usage < tier 1 size (%)	% MWh Change	Average Conservation < tier 1	(f) MWH sales for customer-months with monthly usage > tier 1 size	(g) MWH change for monthly usage > tier 1 size (%)	% MWh Change	Average conservation > tier-1	(h) Total MWH sales for all customer-months = (d) + (f)	(i) MWH change for all customer-months = (e) + (g)
1	A	-0.05	7184.70	54.15	0.8%	2.922	44648.74	-487.75	-1.1%	-14.34	51833.43	-433.60
2		-0.1	7184.70	108.30	1.5%	5.844	44648.74	-975.51	-2.2%	-28.68	51833.43	-867.20
3		-0.15	7184.70	162.46	2.3%	8.766	44648.74	-1463.26	-3.3%	-43.02	51833.43	-1300.81
4	B	-0.05	7184.70	127.11	1.8%	6.859	44648.74	-1057.01	-2.4%	-31.07	51833.43	-929.90
5		-0.1	7184.70	254.22	3.5%	13.717	44648.74	-2114.02	-4.7%	-62.15	51833.43	-1859.80
6		-0.15	7184.70	381.33	5.3%	20.576	44648.74	-3171.03	-7.1%	-93.22	51833.43	-2789.70
7	C	-0.05	11419.10	67.00	0.6%	2.739	40414.32	-441.54	-1.1%	-15.72	51833.42	-374.54
8		-0.1	11419.10	134.01	1.2%	5.478	40414.32	-883.08	-2.2%	-31.44	51833.42	-749.08
9		-0.15	11419.10	201.01	1.8%	8.217	40414.32	-1324.63	-3.3%	-47.17	51833.42	-1123.62
10	D	-0.05	11419.10	145.11	1.3%	5.932	40414.32	-956.82	-2.4%	-34.07	51833.42	-811.71
11		-0.1	11419.10	290.22	2.5%	11.863	40414.32	-1913.64	-4.7%	-68.14	51833.42	-1623.42
12		-0.15	11419.10	435.33	3.8%	17.795	40414.32	-2870.46	-7.1%	-102.21	51833.42	-2435.13