

Rate Design Analyses

December 12 & 13, 2006 Workshops

Rate Designs Analyzed

- Selective Scaling – billing rates (Load Variance, Demand, and Energy) are selectively scaled down from market until BPA's forecasted revenue is equal to BPA's FY 2007-09 Revenue Requirement. Prior to settlement of the rates, the FY 2007-09 rate case used this approach, leaving Demand and LV at market and scaling down Energy by an equal percentage in all months and diurnal periods until the Revenue Requirement was no longer over collected.

The Selective Scaling approach used in the following analysis scales the Energy rates with a constant amount from market versus the percentage approach used in FY 2007-2009. Demand revenues were credited only to HLH because it is thought that HLH market prices include Demand and Energy, whereas LLH is nearly all Energy. Thus, in order to create a true constant delta from market, Demand had to be credited to the hours paying the charge.

The Demand charge was calculated using an opportunity cost approach where every megawatt of capacity held to serve Demand was compared to the lost opportunity of not being able to take advantage of the HLH/LLH Energy spread. The assumption here is that BPA could sell HLH Energy and replace the Energy at LLH prices. Due to not having a Demand market to benchmark off and the fact that the fixed cost of a SCGT is roughly \$10/kW/month, the \$5/kW/month figure calculated here seemed reasonable.

Rate Designs Analyzed

- Equal Scaling – Rates are set at market and then lowered by a constant percentage until BPA's FY 2007-09 Revenue Requirement is no longer over collected. This approach lowers Load Variance as well as Demand. Two separate scenarios were run under the Equal Scaling rate design. The first, labeled Equal Scaling \$5, set Demand's starting position at approximately \$5/kW/month. The second, labeled Equal Scaling \$10, set Demand at \$10/kW/month.
- Peak Credit – Demand is set at the fixed costs of a new SCGT, which is calculated to be \$10/kW/month according to the study used. Load Variance was held constant from FY 2007-09 and Energy rates were reduced by an equal percentage until BPA's FY 2007-09 Revenue Requirement was no longer over collected.
- Classic – Return to 1987 rate design where 80% of costs are assigned to Energy, 20% to Demand; 67% of Energy to winter, and 33% of Energy to summer. Summer is defined as April through August and winter as September through March.

Rate Designs Analyzed

- Customer “Think Piece” – Method A through C were crafted with the customer paper in mind. All are assumed to be charged on an expected value basis.
 - ❖ **Method A** – This is simply BPA’s FY 2007-09 Revenue Requirement divided by three and split between customers based on their forecast percentage take of the system. Load Variance costs were split out and charged only to load following customers based on their percentage share.
 - ❖ **Method B** – This method attempts to differentiate between customers based on how much shaping they used compared to BPA’s critical water shape. The billing determinant of each customer was figured by using the absolute value of kWh differences. The billing determinant was then applied to BPA’s total shaping cost. This method has a tendency to hurt some customers because low cost shaping (such as higher relative load in off peak months) is treated the same as high cost shaping (such as winter heavy shapes). This method is a blend of methods A and C. Load Variance costs were split out and charged only to load following customers based on their percentage share.
 - ❖ **Method C** – This method attempts to put a dollar value to differences from BPA’s critical water. Negative differences from critical are sold at a market price and positive differences from critical are bought at a market price. The net of these values is charged to each customer. Load Variance costs were split out and charged only to load following customers based on their percentage share.

In Methods A through C, the use of capacity is not addressed and will cause socialization of BPA’s added capacity costs through time.

Assumptions and Other Information

The following analyses uses 2008 load forecasts and the FY2007-2009 average revenue requirement. Because billing determinants change slightly among the three years, the overall percentage changes in charges could be plus or minus a small amount from that found on the following graphs.

Market Price (from May 2006)												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$53.34	\$63.03	\$66.13	\$59.13	\$59.27	\$56.85	\$47.16	\$41.76	\$41.17	\$49.51	\$54.63	\$56.83
LLH	\$46.08	\$52.01	\$54.79	\$50.01	\$52.39	\$50.21	\$40.56	\$35.55	\$31.27	\$41.07	\$46.87	\$50.78

Using Method C's (from the customer think piece) cost of shaping approach, the following numbers represent how those costs are separated between different customers. These were provided in response to discussions of aggregating shaping costs in some fashion. Some ideas include size, product type, location, customer choice, or a mix of any of the following. The following calculations represent BPA's cost to shape 1aMW of load for each of BPA's customers.

<i>Full and Partial</i>		<i>Block</i>		<i>25 aMW and Smaller</i>		<i>Larger than 25 aMW</i>	
Mean	\$ 5,686.82	Mean	\$ 1,814.78	Mean	\$ 4,875.69	Mean	\$ 4,748.85
Median	\$ 9,382.96	Median	\$ 4,106.85	Median	\$ 9,144.78	Median	\$ 6,998.88
Standard Deviation	\$ 10,537.03	Standard Deviation	\$ 12,324.79	Standard Deviation	\$ 11,644.32	Standard Deviation	\$ 10,095.66
Minimum	\$ (38,017.45)	Minimum	\$ (33,641.87)	Minimum	\$ (38,017.45)	Minimum	\$ (26,016.08)
Maximum	\$ 26,404.56	Maximum	\$ 33,450.22	Maximum	\$ 26,404.56	Maximum	\$ 33,450.22

Resulting Rates

FY 07-09 rates												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$29.70	\$31.68	\$33.06	\$28.07	\$28.66	\$26.59	\$24.95	\$20.84	\$18.87	\$23.24	\$27.21	\$28.09
LLH	\$21.76	\$23.11	\$24.26	\$20.30	\$20.50	\$19.49	\$17.93	\$14.41	\$10.02	\$17.01	\$20.19	\$22.54
Demand	\$1.94	\$2.08	\$2.18	\$1.85	\$1.88	\$1.75	\$1.64	\$1.36	\$1.25	\$1.53	\$1.79	\$1.85
LV Rate	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47

Selective Scaling												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$15.55	\$25.24	\$28.34	\$21.35	\$21.48	\$19.06	\$9.37	\$3.98	\$3.39	\$11.72	\$16.84	\$19.04
LLH	\$20.84	\$26.77	\$29.56	\$24.77	\$27.15	\$24.98	\$15.33	\$10.32	\$6.03	\$15.83	\$21.64	\$25.54
Demand	\$5.22	\$5.02	\$5.02	\$5.22	\$4.82	\$5.42	\$5.02	\$5.22	\$5.22	\$5.02	\$5.42	\$4.82
LV Rate	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47

Equal Scaling - Market demand at Selective Scaling demand \$5/kW/mo												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$24.21	\$28.61	\$30.02	\$26.84	\$26.90	\$25.81	\$21.41	\$18.96	\$18.69	\$22.47	\$24.80	\$25.80
LLH	\$20.92	\$23.61	\$24.88	\$22.70	\$23.78	\$22.79	\$18.41	\$16.14	\$14.19	\$18.64	\$21.28	\$23.05
Demand	\$2.37	\$2.28	\$2.28	\$2.37	\$2.19	\$2.46	\$2.28	\$2.37	\$2.37	\$2.28	\$2.46	\$2.19
LV Rate	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21	\$0.21

Equal Scaling - Market demand at \$10/kW/mo												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$21.36	\$25.24	\$26.48	\$23.68	\$23.73	\$22.77	\$18.88	\$16.72	\$16.49	\$19.82	\$21.88	\$22.76
LLH	\$18.45	\$20.83	\$21.94	\$20.02	\$20.98	\$20.11	\$16.24	\$14.24	\$12.52	\$16.44	\$18.77	\$20.33
Demand	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00
LV Rate	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19

Peak Credit												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$10.92	\$12.90	\$13.54	\$12.10	\$12.13	\$11.64	\$9.65	\$8.55	\$8.43	\$10.13	\$11.18	\$11.63
LLH	\$9.43	\$10.65	\$11.22	\$10.24	\$10.72	\$10.28	\$8.30	\$7.28	\$6.40	\$8.41	\$9.60	\$10.39
Demand	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
LV Rate	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47	\$0.47

Classic Rate Design												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
HLH	\$23.81	\$23.81	\$23.81	\$23.81	\$23.81	\$23.81	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$23.81
LLH	\$23.81	\$23.81	\$23.81	\$23.81	\$23.81	\$23.81	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$23.81
Demand	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32
LV Rate	-	-	-	-	-	-	-	-	-	-	-	-

Monthly	FY 07-09 Slice
per 1% of Slice	\$1,877,054

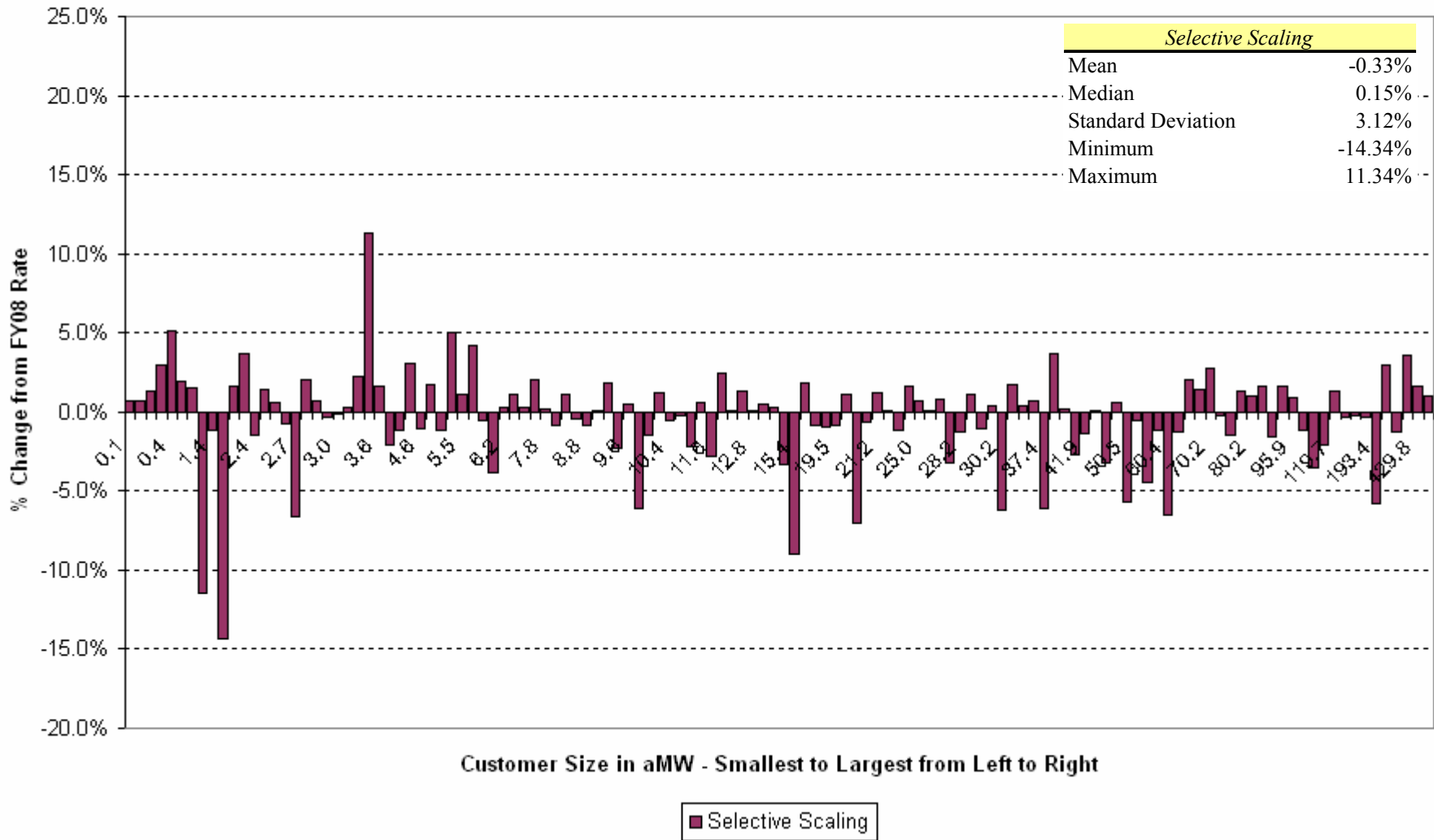
Monthly	Method A
per 1% of system	\$1,386,484
per 1% of Load	
Variance	\$13,152

Monthly	Method B
per 1% of system	\$1,354,816
per 1% of Load	
Variance	\$13,152
per Shaping Billing	
Determinant	\$2.61

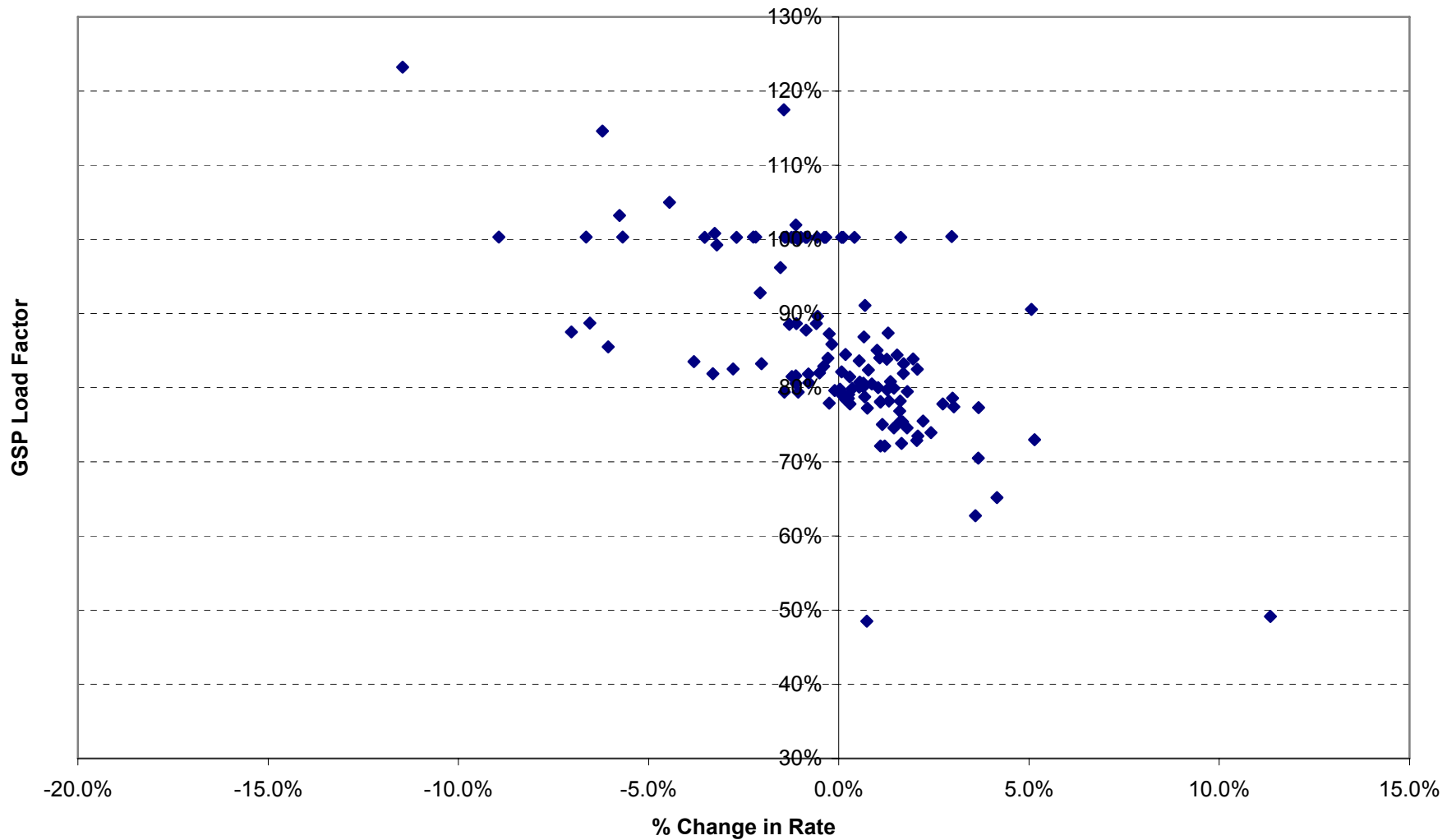
Monthly	Method C
per 1% of system	\$1,354,816
per 1% of Load	
Variance	\$13,152

Shaping Charge	Utility Specific @ Market Rates
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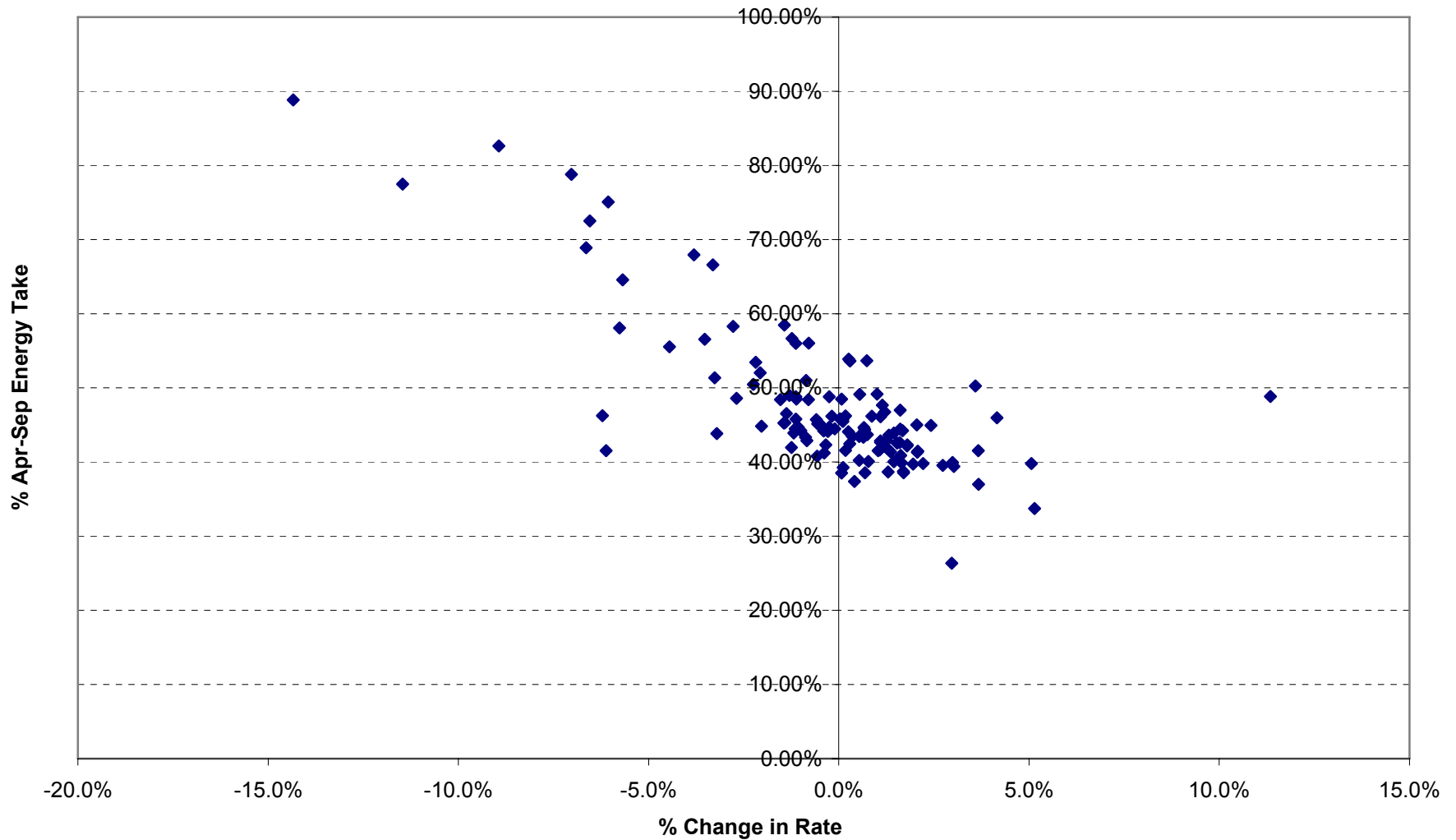
**Selective Scaling - The FY2007-09 rates are a form of Selective Scaling
 The below approach fixes Demand and LV at Market and reduces energy by a fixed constant until the
 RR is met. Demand is credited only to HLH Energy.**



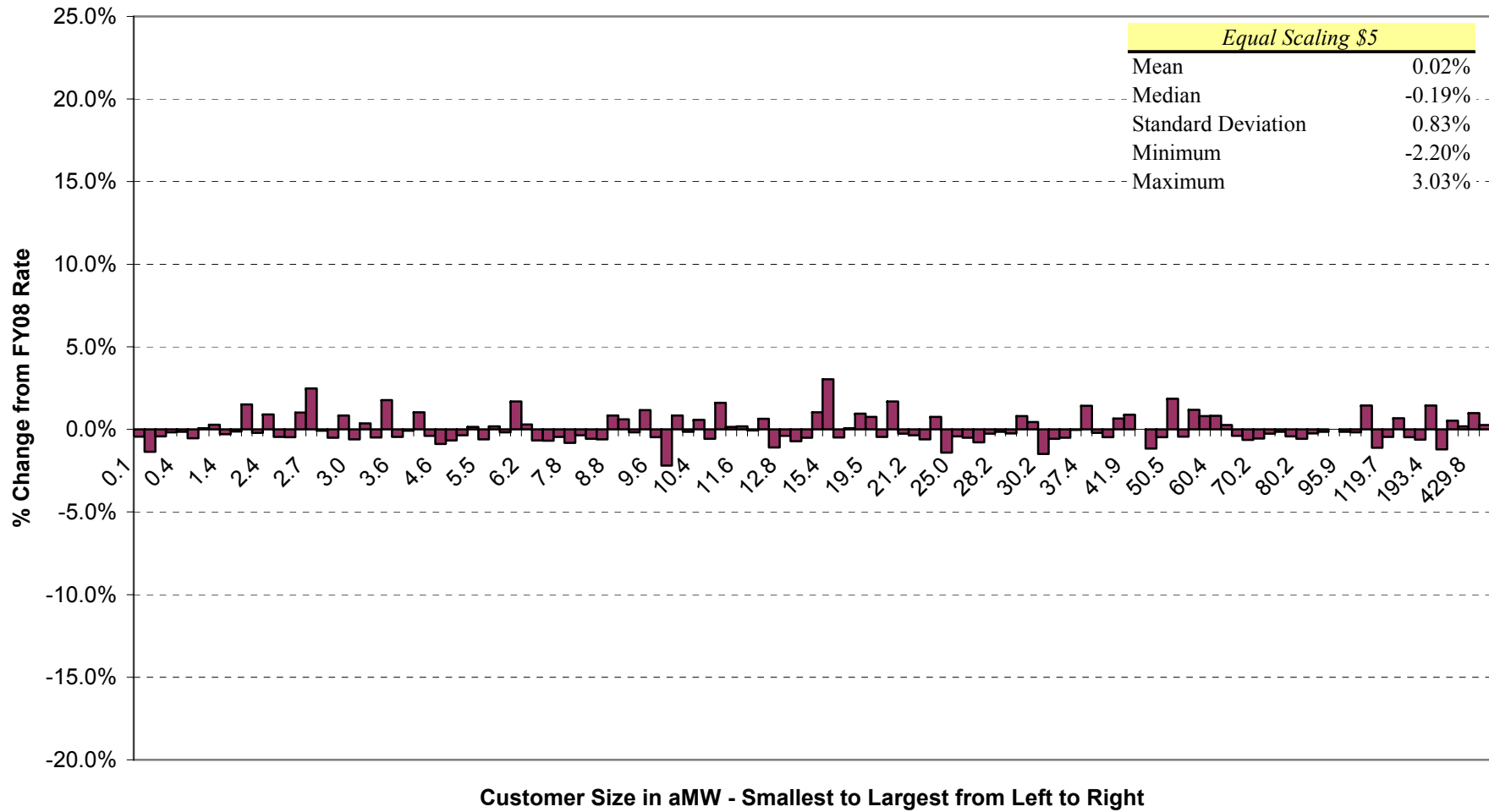
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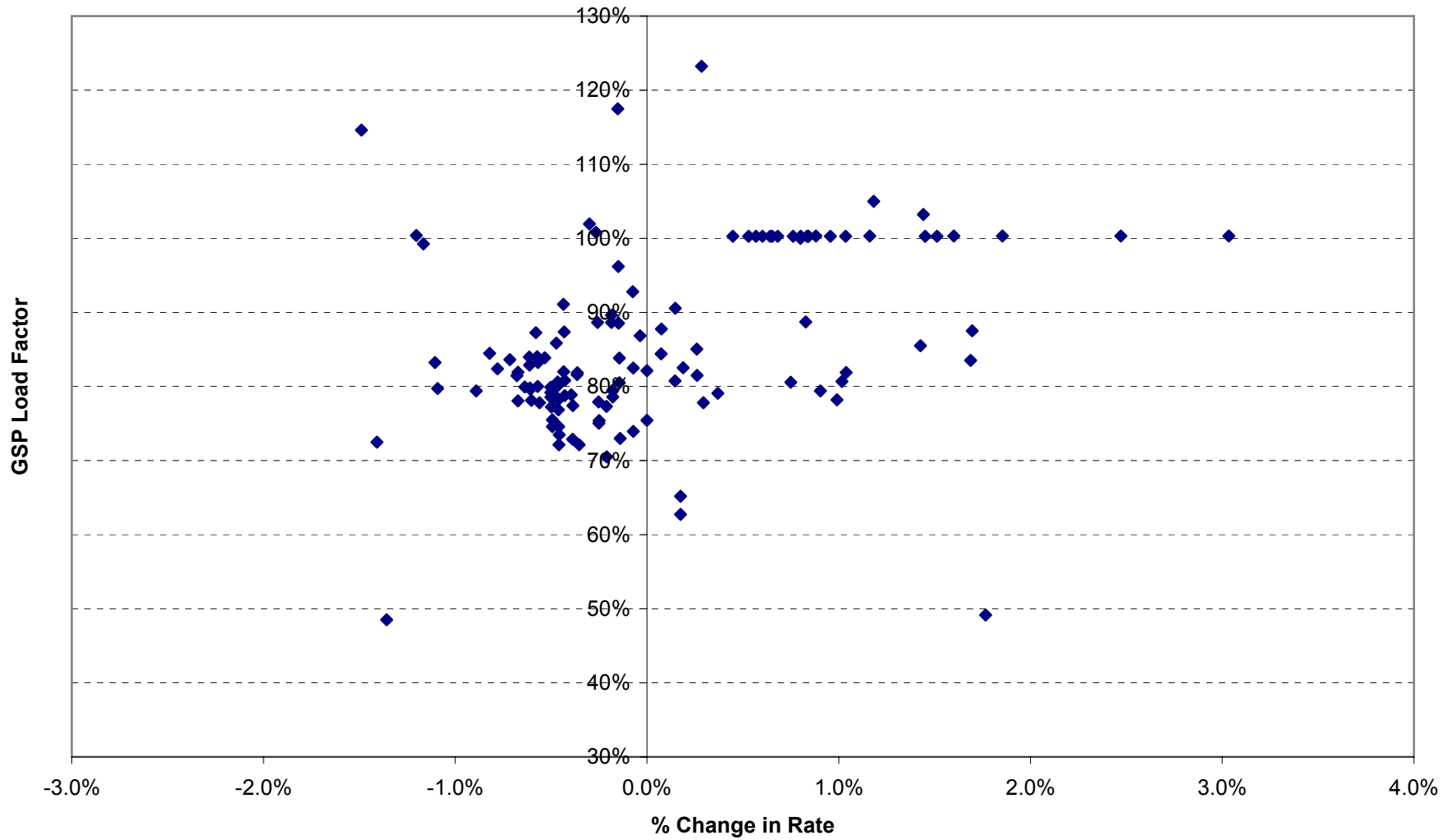


Equal Scaling \$5/kW/month
Energy, Demand and LV set at market and all reduced by percentage until RR is met
\$5/kW/month market Demand assumed

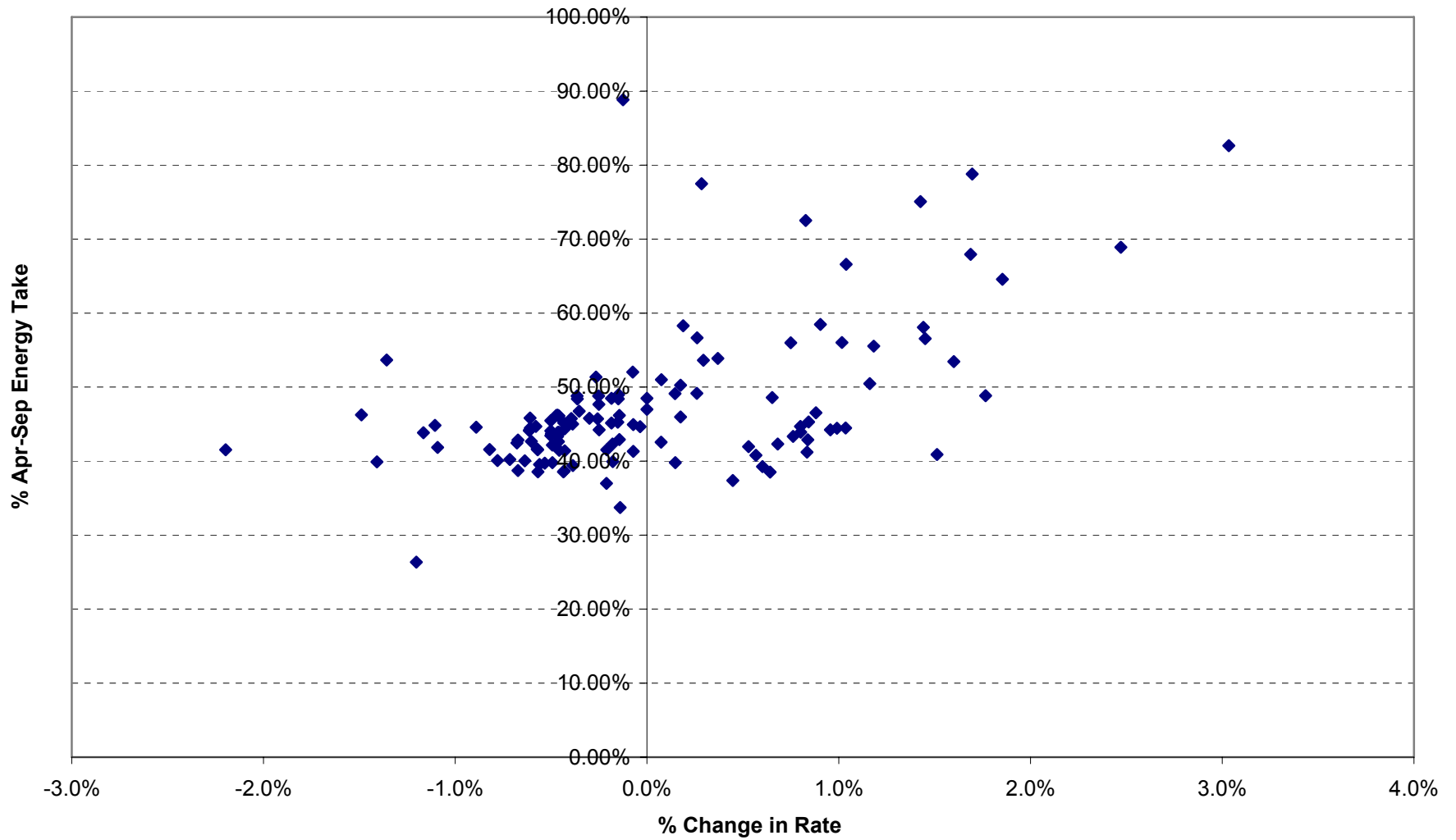


■ Equal Scaling \$5

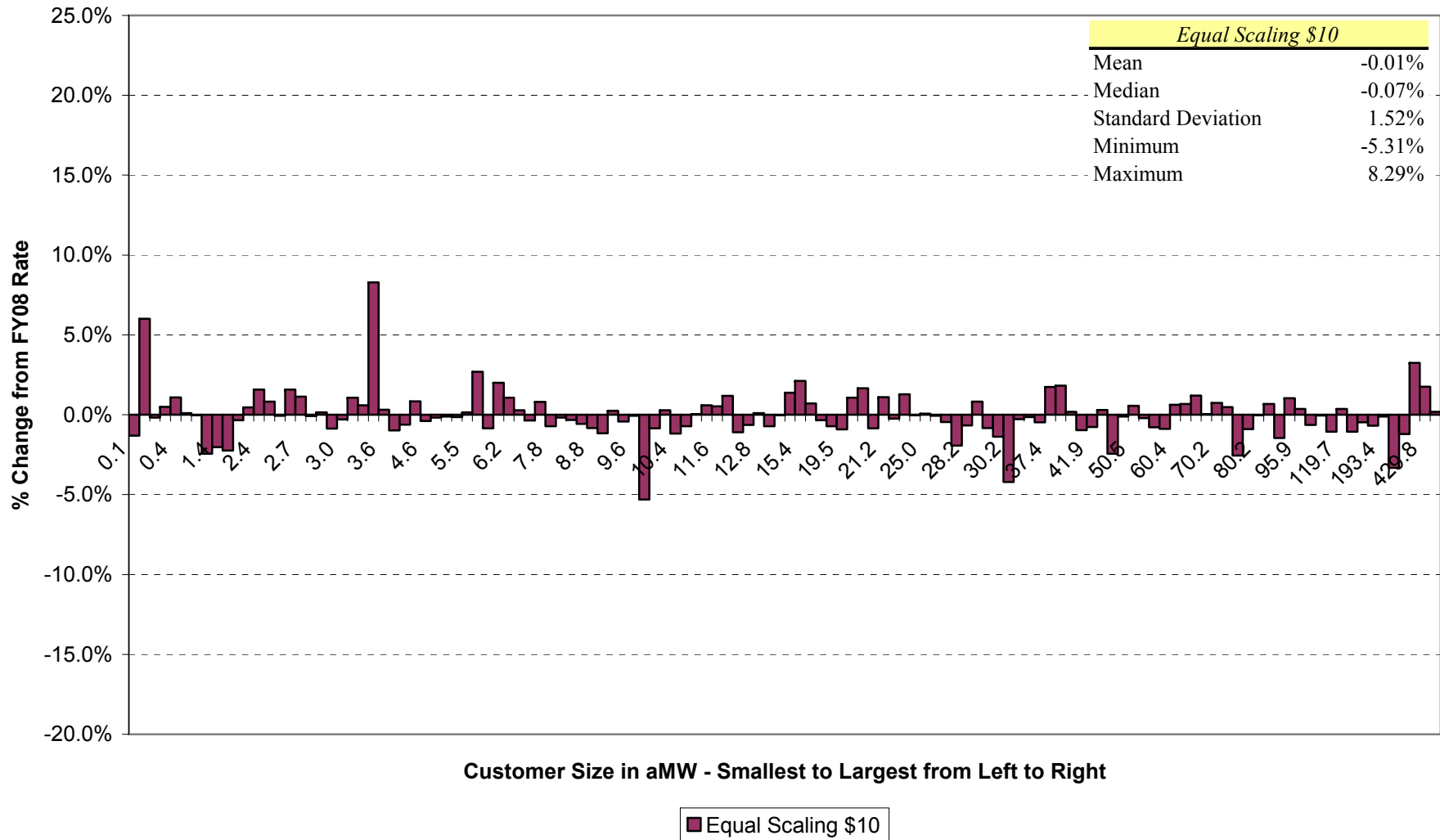
Equal Scaling \$5/kW/month
Energy, Demand and LV set at market and all reduced by percentage until RR is met
\$5/kW/month market Demand assumed



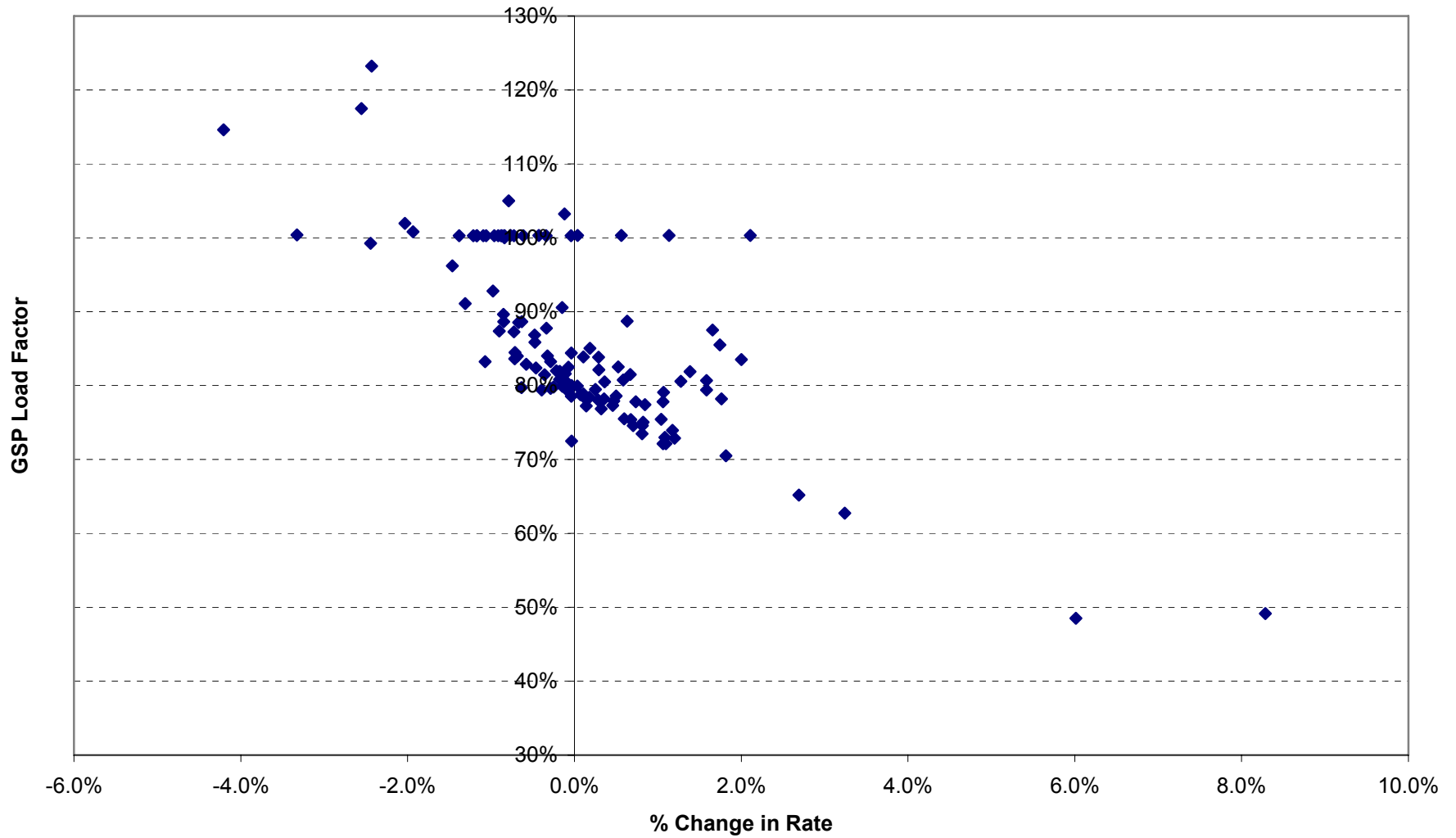
Equal Scaling \$5/kW/month
Energy, Demand and LV set at market and all reduced by percentage until RR is met
\$5/kW/month market Demand assumed



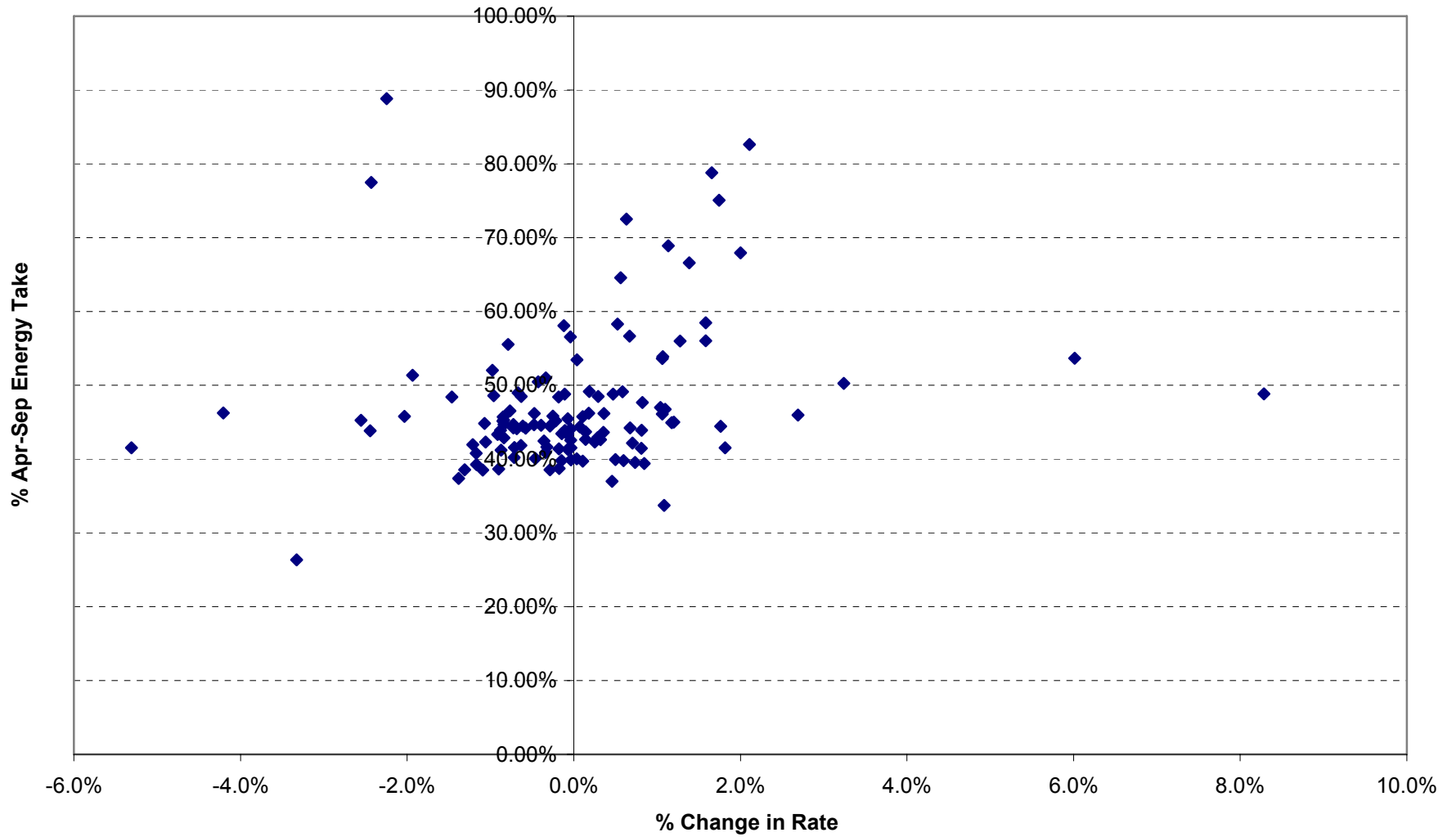
Equal Scaling \$10/kW/month
Energy, Demand and LV set at market and all reduced by percentage until RR is met
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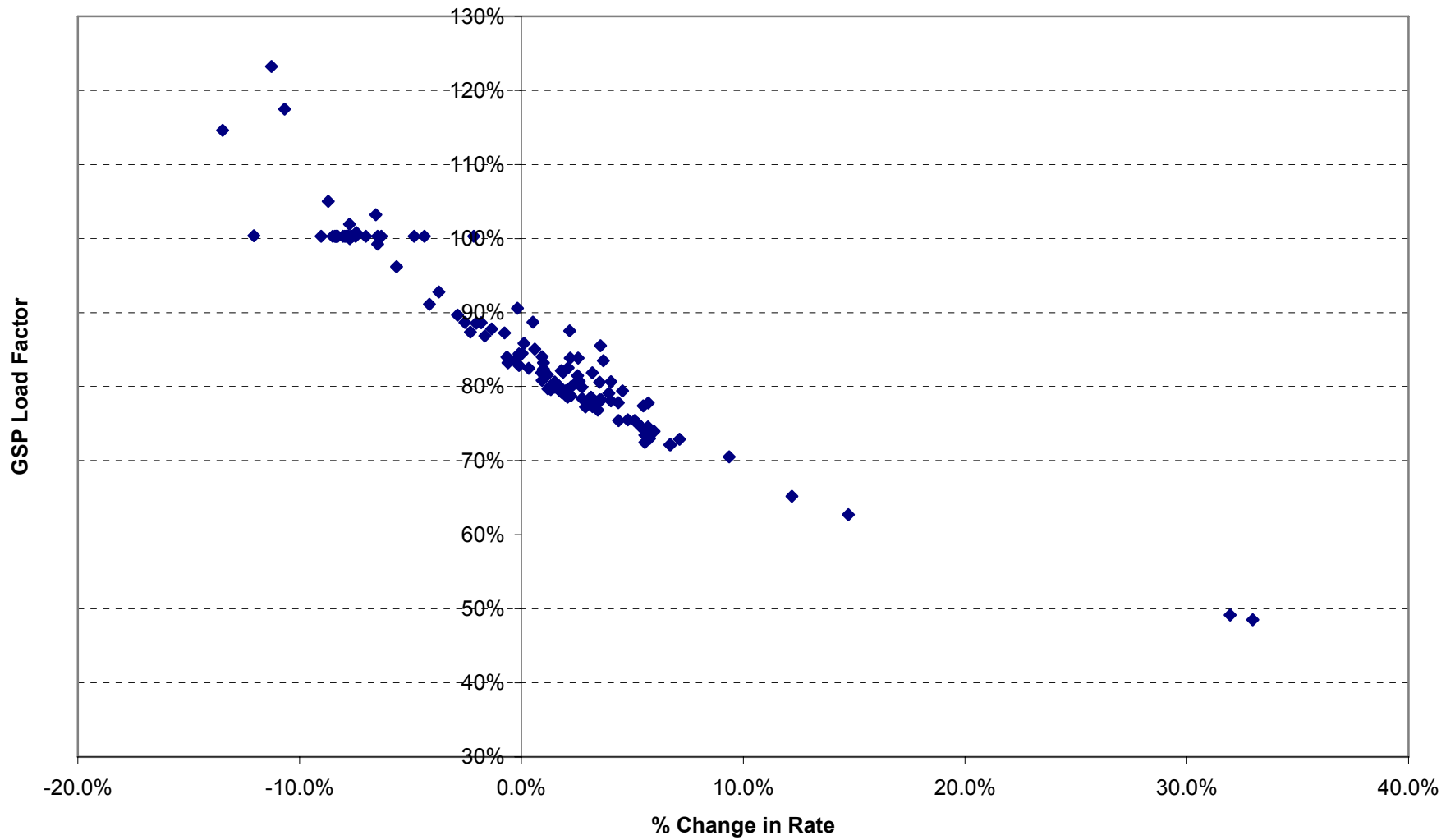
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Energy, Demand and LV set at market and all reduced by percentage until RR is met
\$10/kW/month market Demand assumed



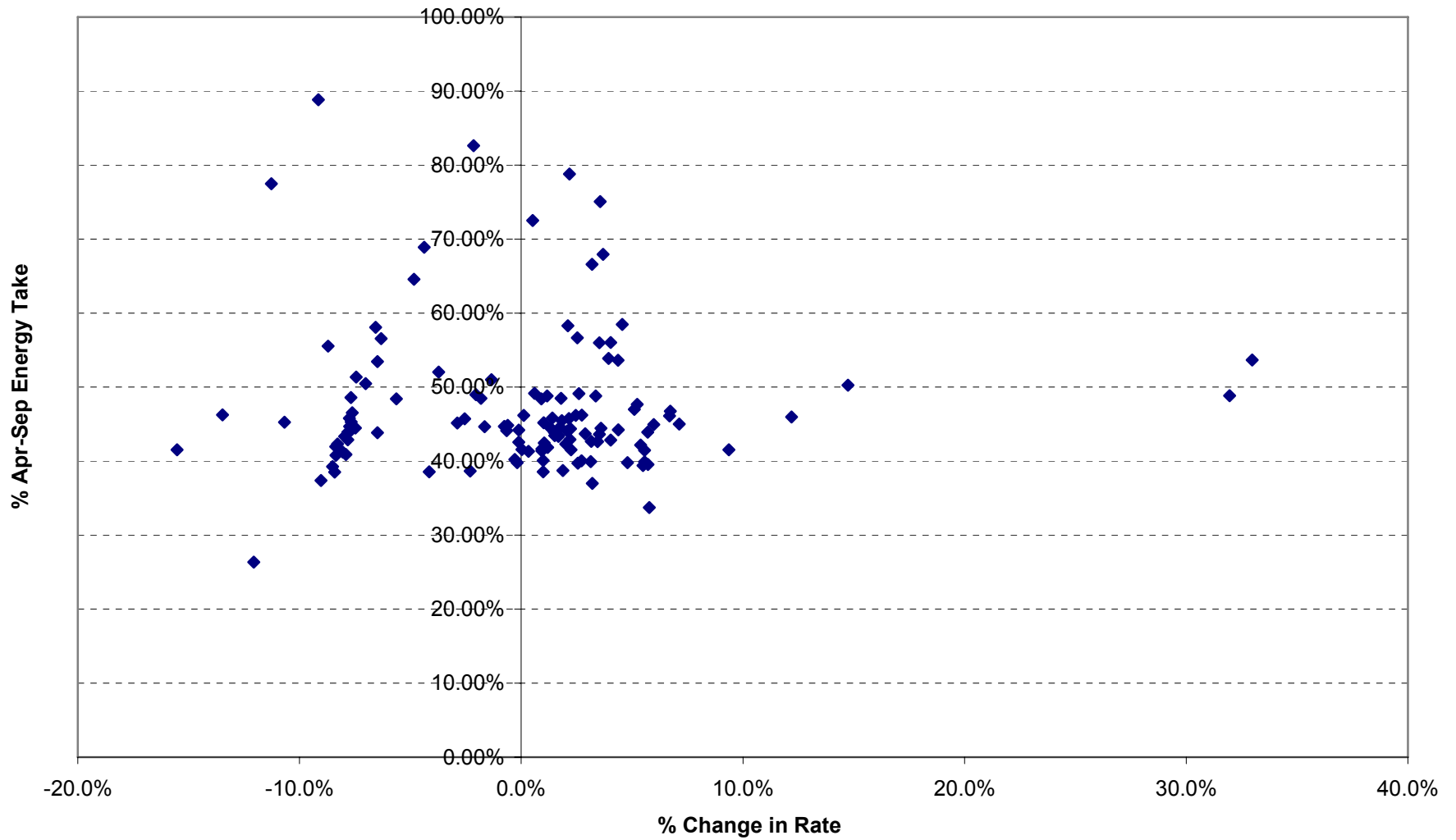
**Peak Credit - Demand set at cost of SCGT or \$10/kW/month
Energy and LV scaled down by a percentage until RR is met**



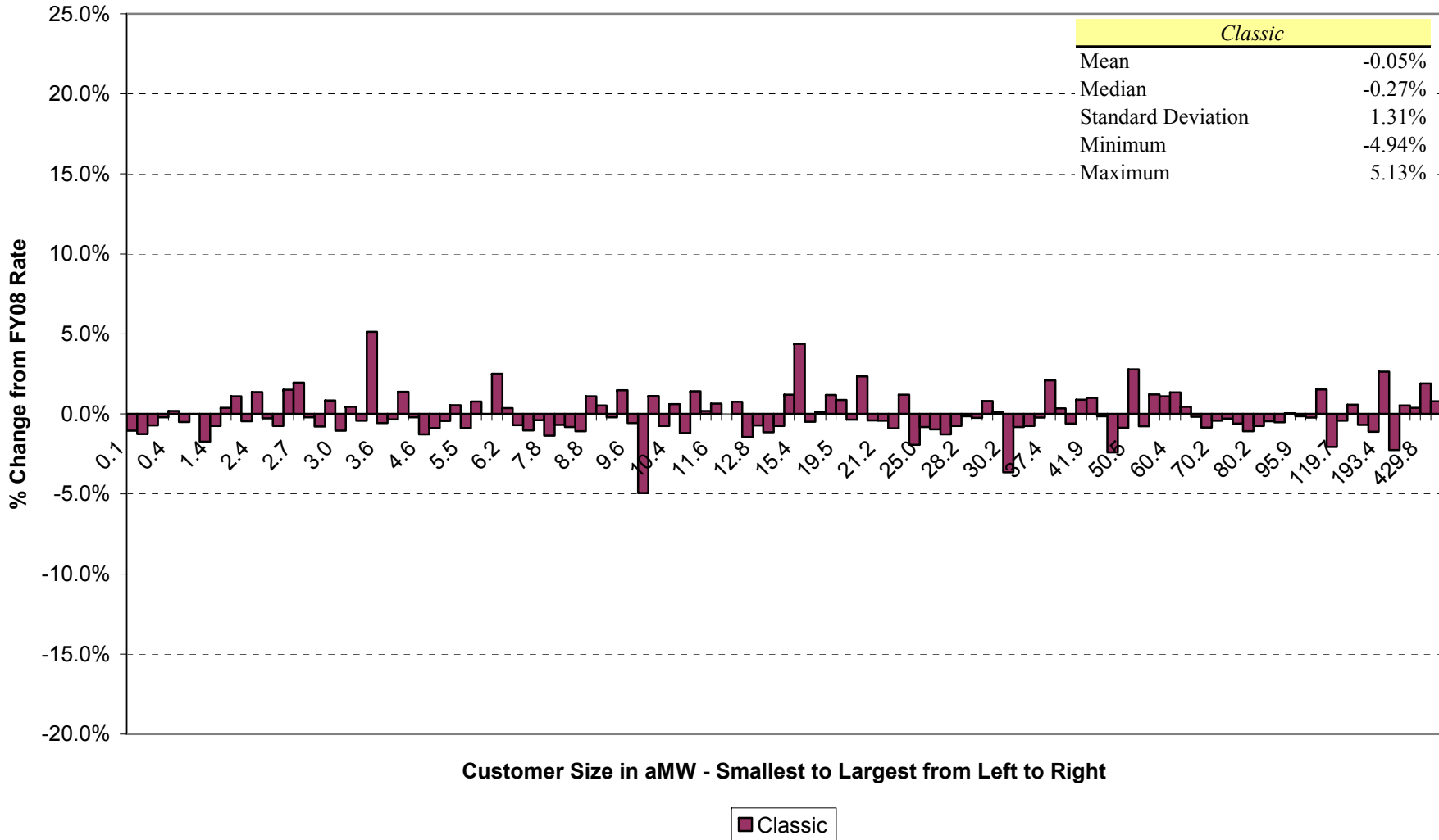
**Peak Credit - Demand set at cost of SCGT or \$10/kW/month
Energy and LV scaled down by a percentage until RR is met**



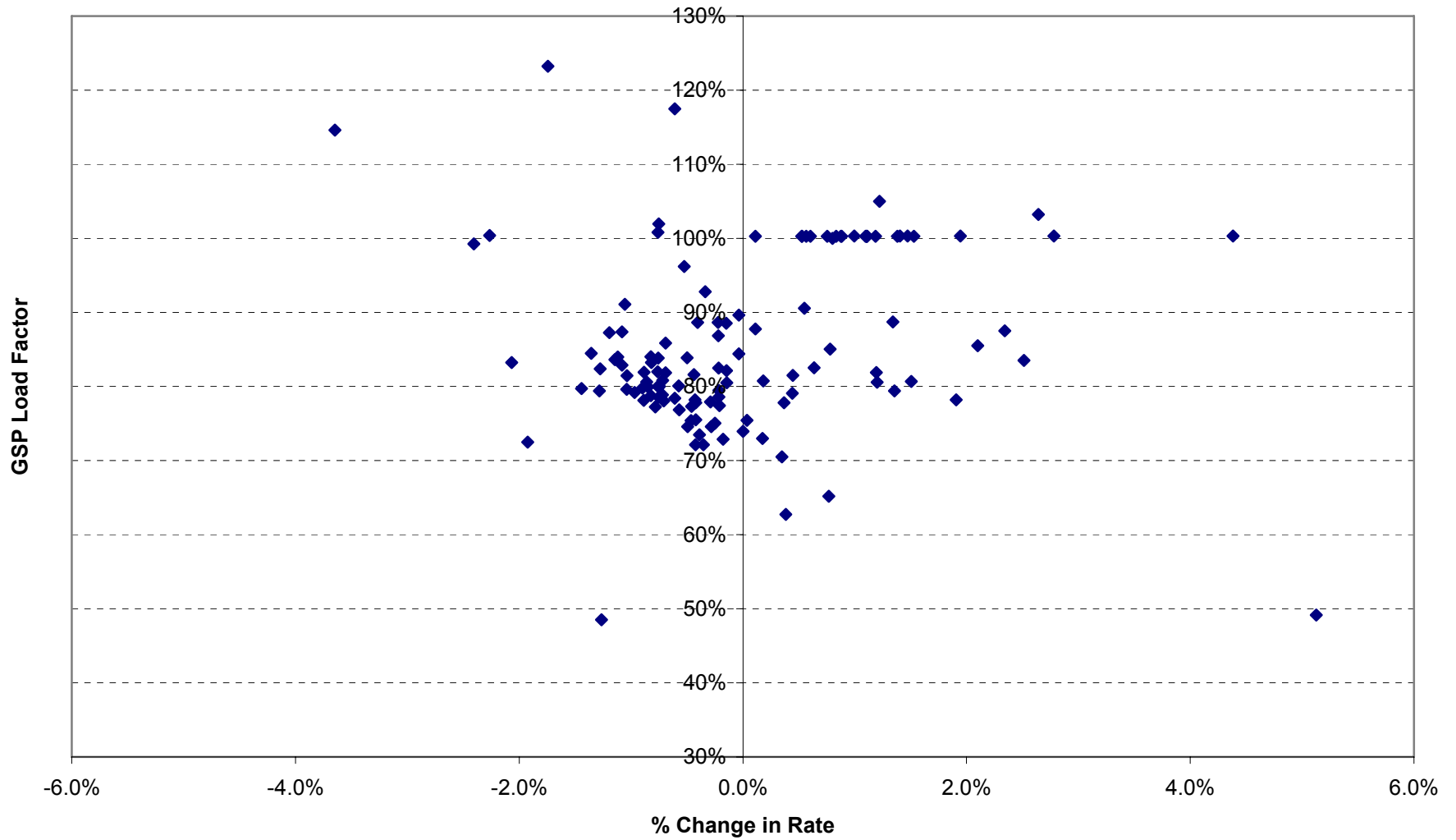
**Peak Credit - Demand set at cost of SCGT or \$10/kW/month
Energy and LV scaled down by a percentage until RR is met**



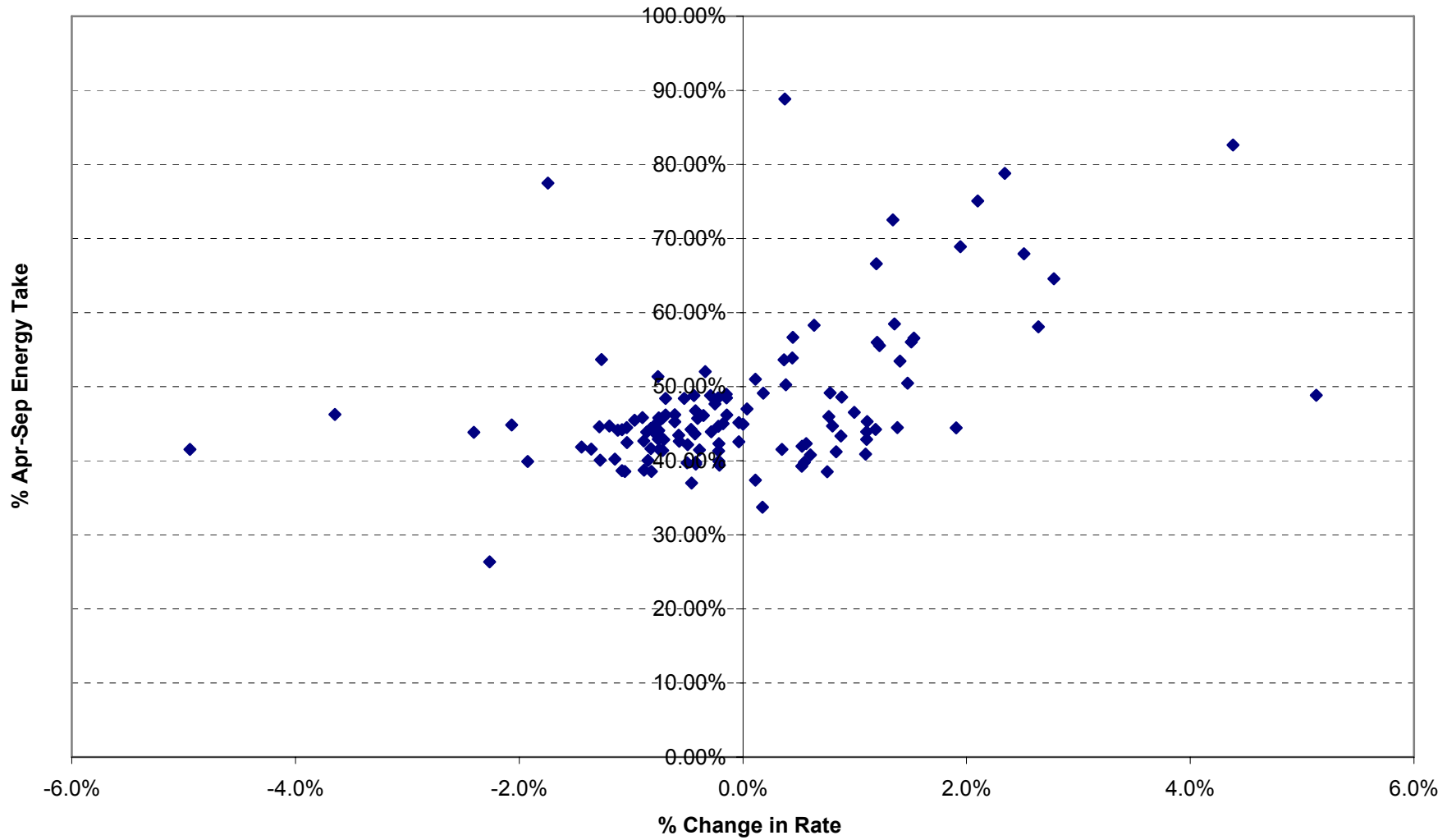
**Classic Rate Design - 80% Energy 20% Demand
67% Winter 33% Summer
Winter = September through March Summer = April through August**



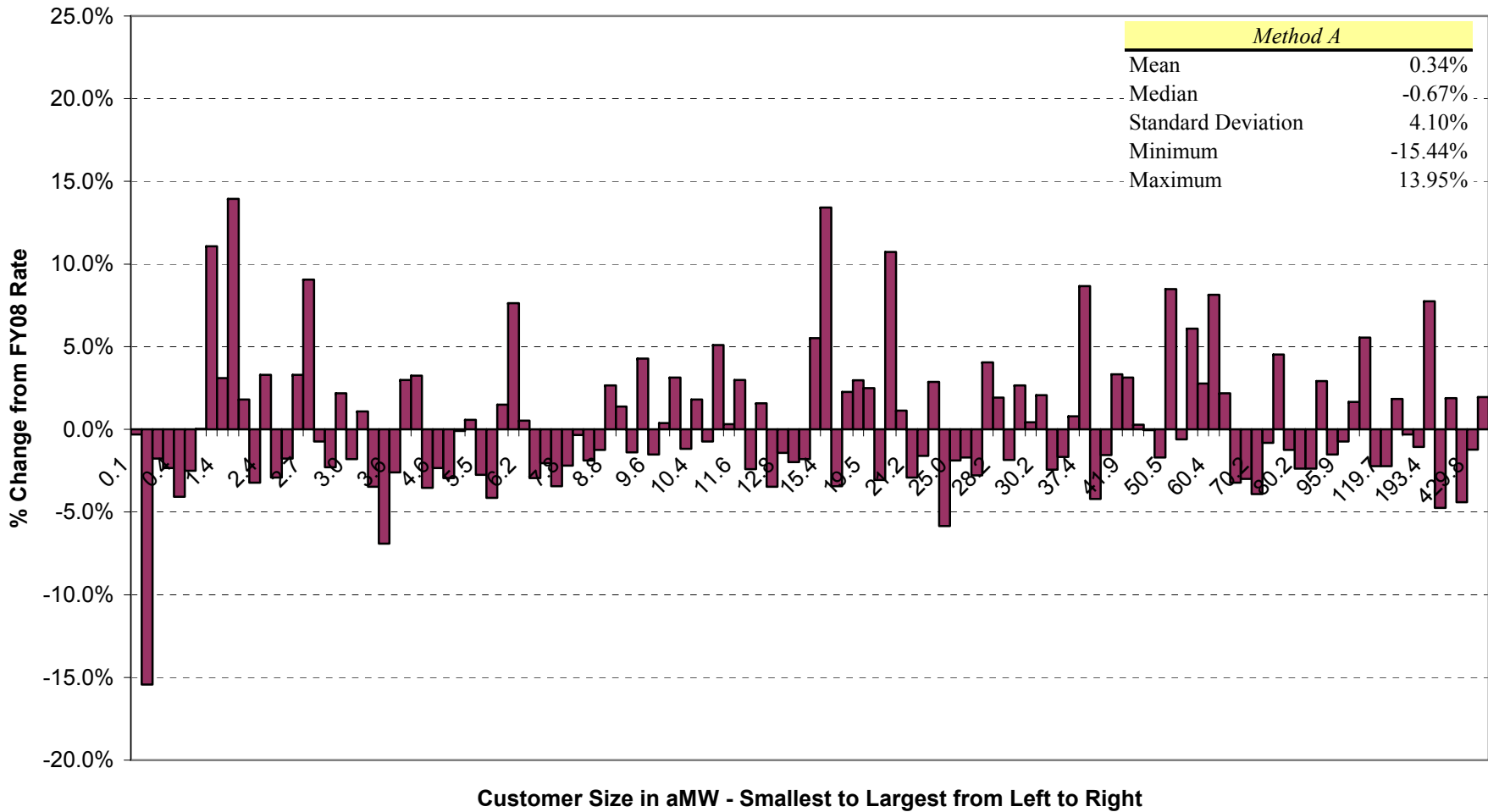
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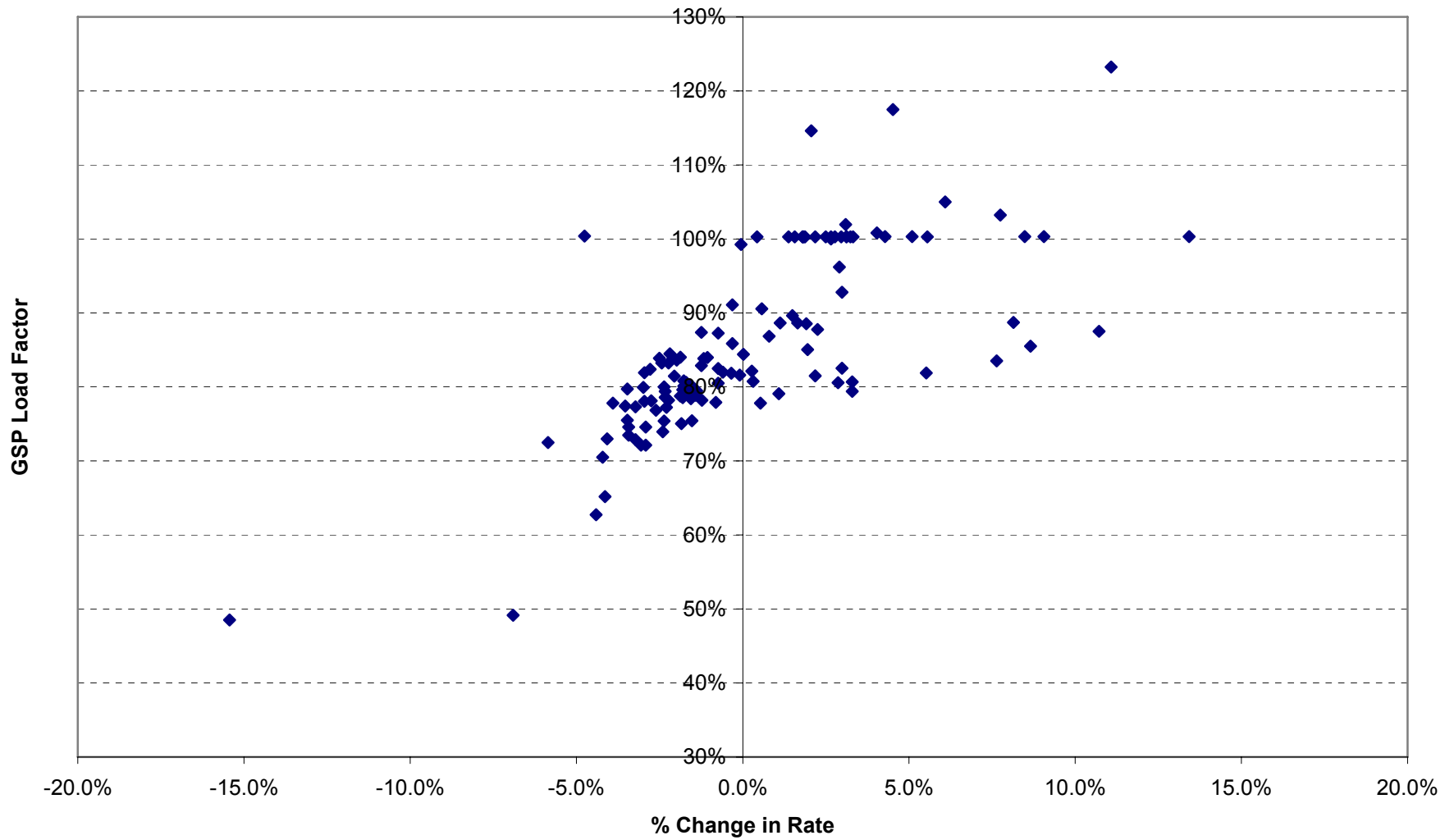


Customer "Think Piece" - Method A
[Revenue Requirement] - [Load Variance Costs] * [% of System] + [% share of Load Variance]
Increase/Decrease from FY08 rates

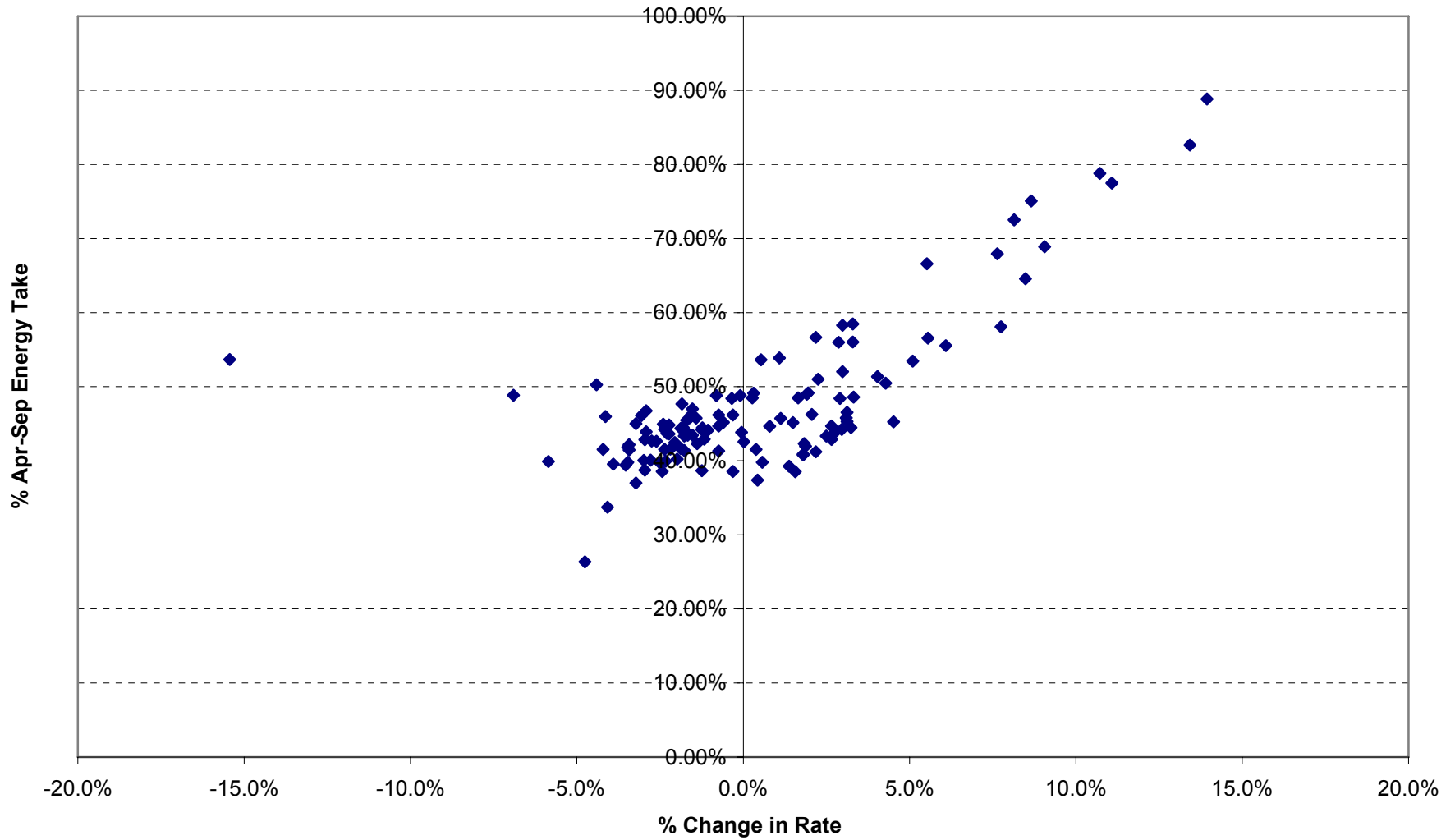


Method A

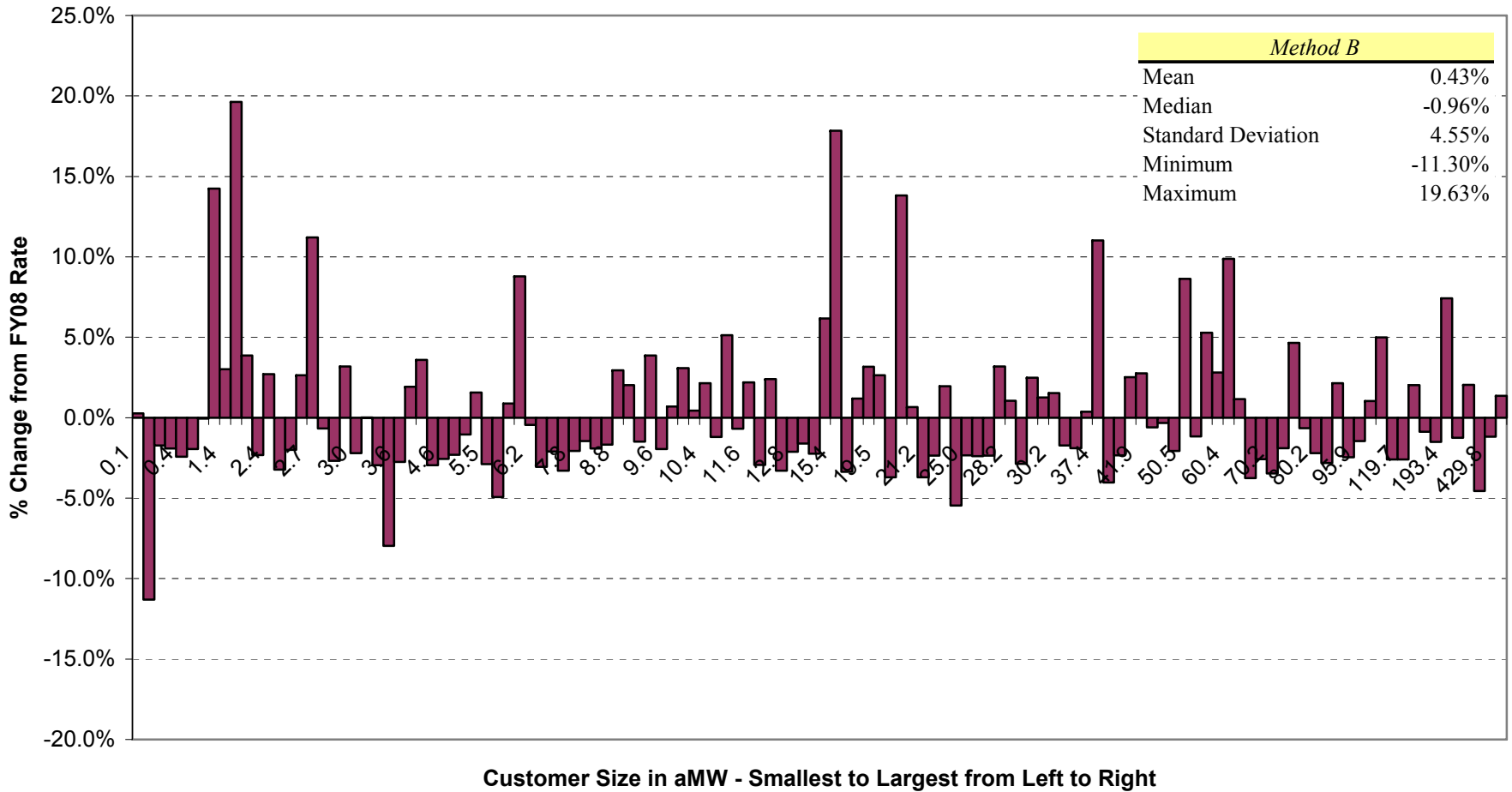
Customer "Think Piece" - Method A
[Revenue Requirement] - [Load Variance Costs] * [% of System] + [% share of Load Variance]
Increase/Decrease from FY08 rates



Customer "Think Piece" - Method A
[Revenue Requirement] - [Load Variance Costs] * [% of System] + [% share of Load Variance]
Increase/Decrease from FY08 rates

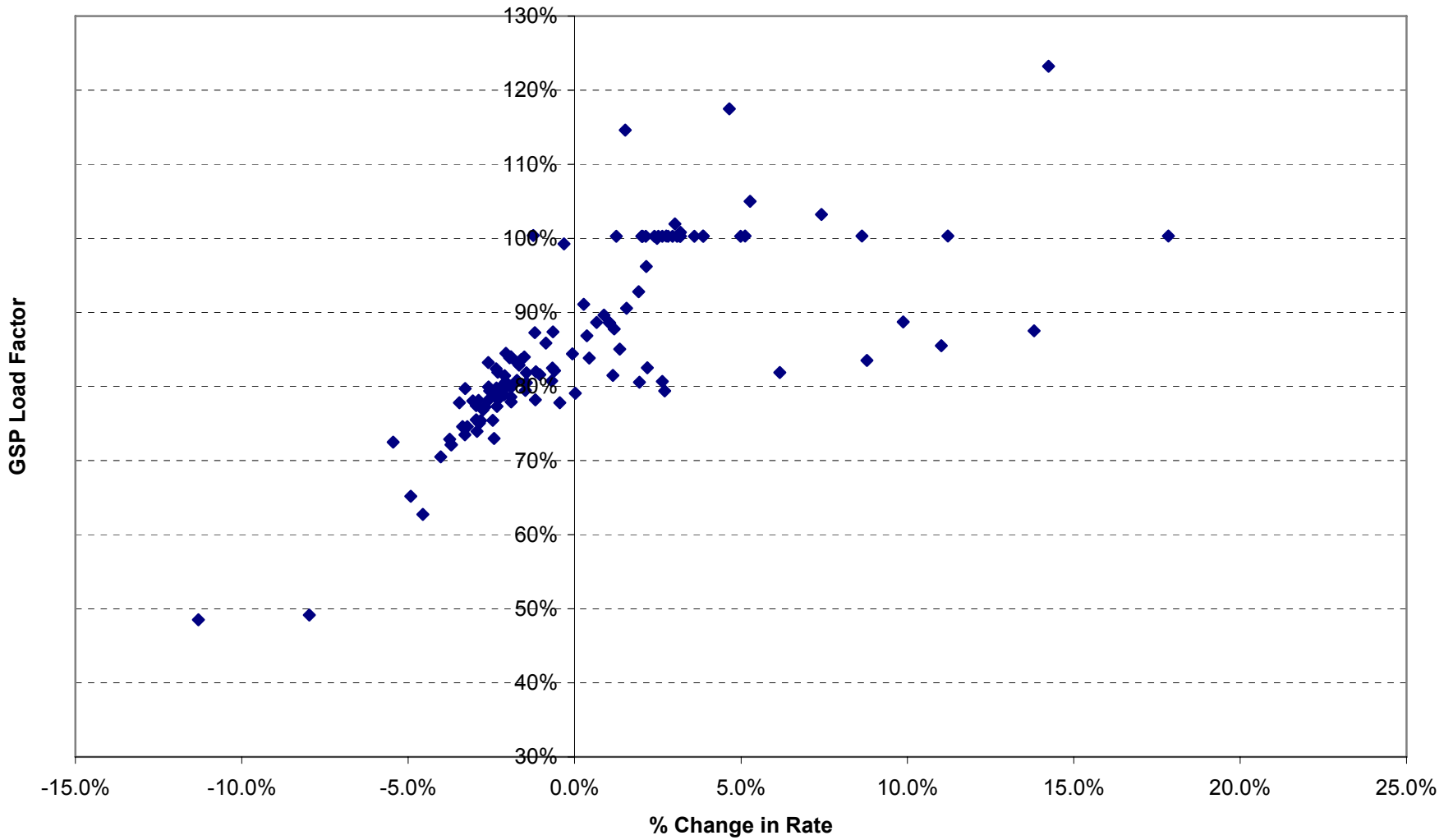


Customer "Think Piece" - Method B
[[Revenue Requirement] - [Total Net Shaping Costs] - [Load Variance Costs]] * [% of System] + [Total Net Shaping Costs] * [Shaping Determinant] + [% share of Load Variance]
Increase/Decrease from FY08 rates

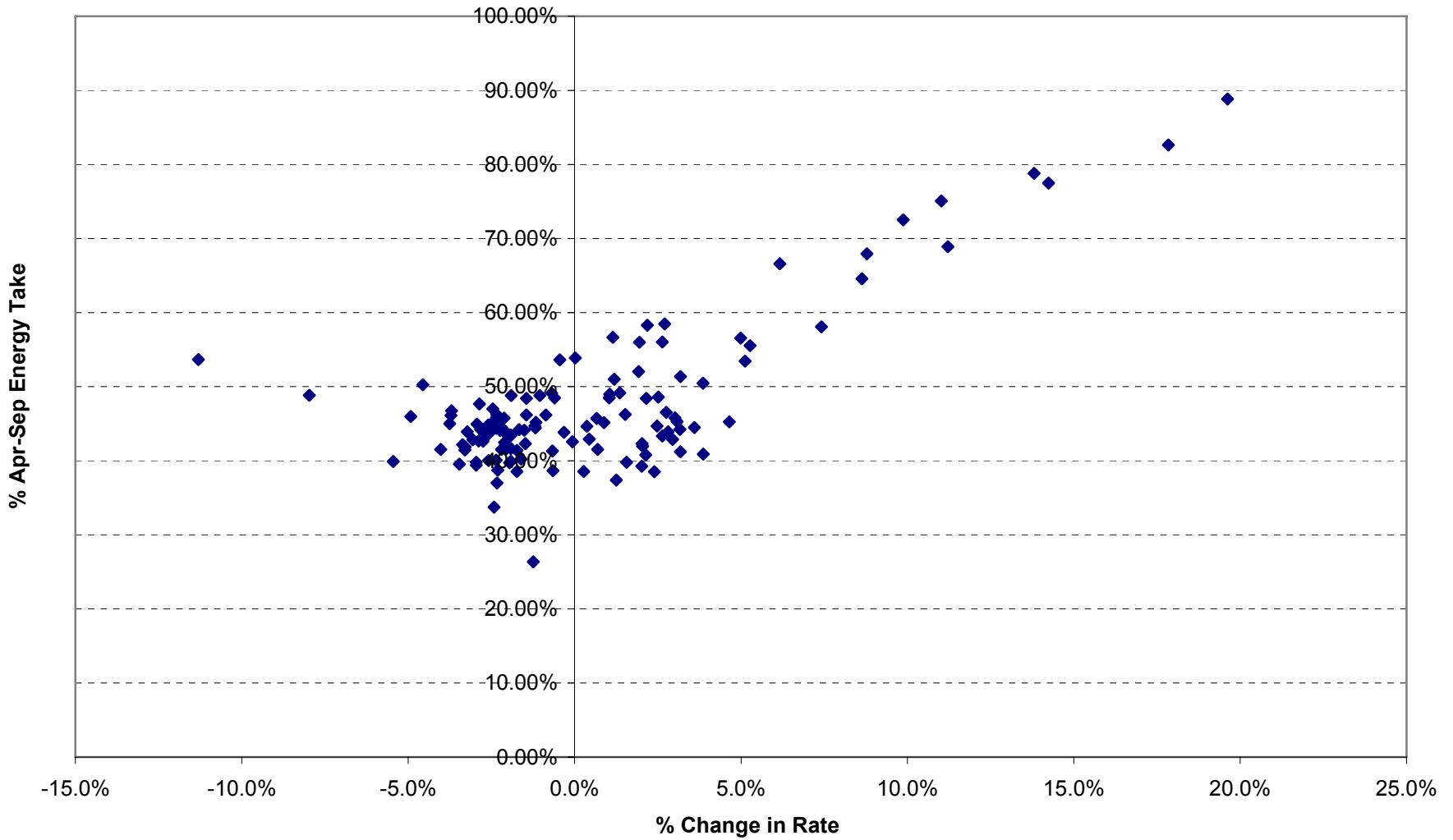


Method B

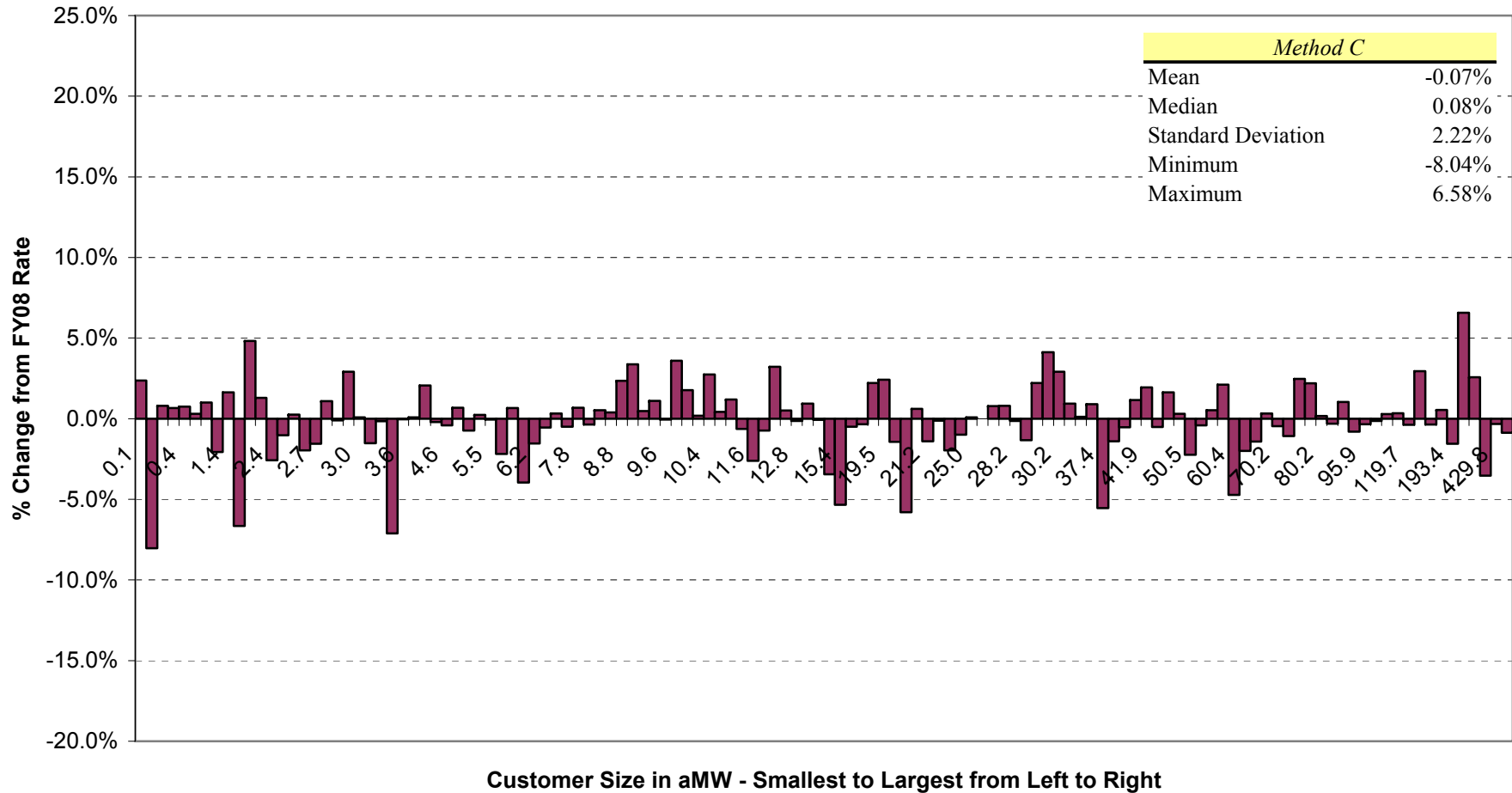
Customer "Think Piece" - Method B
[[Revenue Requirement] - [Total Net Shaping Costs] - [Load Variance Costs]] * [% of System] + [Total Net Shaping Costs] * [Shaping Determinant] + [% share of Load Variance]
Increase/Decrease from FY08 rates



Customer "Think Piece" - Method B
[[Revenue Requirement] - [Total Net Shaping Costs] - [Load Variance Costs]] * [% of System] + [Total Net Shaping Costs] * [Shaping Determinant] + [% share of Load Variance]
Increase/Decrease from FY08 rates



Customer "Think Piece" - Method C - Individualized Shaping Charge
[[Revenue Requirement] - [Total Net Shaping Costs] - [Load Variance Costs]] * [% of System] + [Customer Net Shaping Costs] + [% share of Load Variance]
Increase/Decrease from FY08 rates



Method C

Customer "Think Piece" - Method C - Individualized Shaping Charge
[[Revenue Requirement] - [Total Net Shaping Costs] - [Load Variance Costs]] * [% of System] + [Customer Net Shaping Costs] + [% share of Load Variance]
Increase/Decrease from FY08 rates

