

2010 Load Forecast Uncertainty Results

Arthur Maniaci
New York Independent System Operator

NYSRC Installed Capacity Subcommittee
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(1) 2009 IRM Base Case Recommendations for LFU

- ◆ NYISO recommends using LIPA results for Zone K
- ◆ NYISO recommends using NYISO results for Rest of State
- ◆ NYISO recommends using NYISO results for Con-Ed System, for both Zone J and for H & I
 - *Recommendation may change, pending review of Con-Ed's LFU models*

Recommended LFU Values

2010 Load Forecast Uncertainty Model

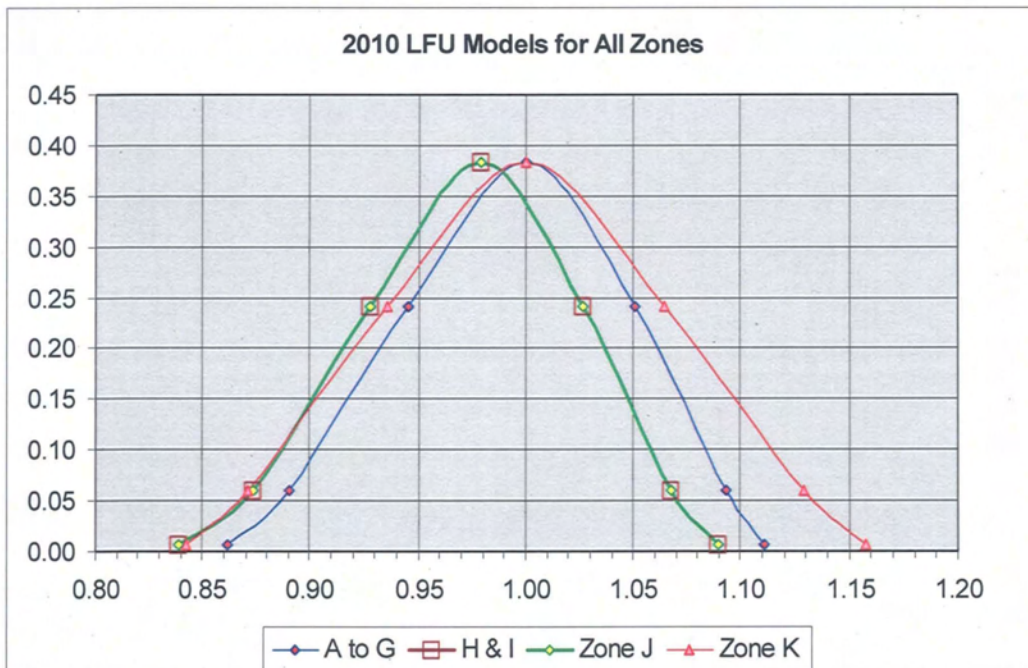
Bin No.	Probability	A-G	H & I	Zone J	Zone K
1	0.6%	86.2%	83.9%	83.9%	84.3%
2	6.1%	89.0%	87.3%	87.3%	87.1%
3	24.2%	94.5%	92.7%	92.7%	93.5%
4	38.3%	100.0%	97.9%	97.9%	100.0%
5	24.2%	105.1%	102.6%	102.6%	106.5%
6	6.1%	109.3%	106.7%	106.7%	112.9%
7	0.6%	111.1%	108.9%	108.9%	115.7%
100.00%		+/-12.4	+/- 12.5%	+/- 12.5%	+/-15.7%
2009		+/-13.0	+/- 11.7%	+/- 11.7%	+/-15.8%

2010 values are virtually identical to 2009 recommended values

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2010 LFU Models for All Zones



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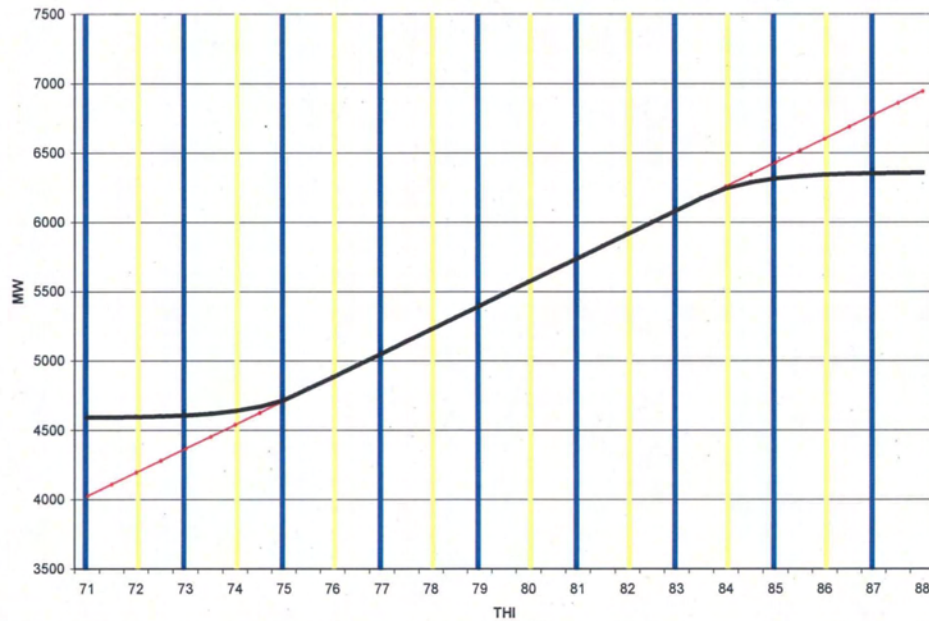
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Per-Unit Modeling Methodology

- ♦ Assemble daily peak MW for a given zone
 - 1999 to 2008, May to September
 - Delete outliers, holidays & Fridays
 - Add adjustments for load management & other EOPs
- ♦ Assemble daily CTHI or TV data, 1975 to 2008
 - Obtain peak-producing CTHI or TV data for each zone or zones
 - Obtain mean & sigma for PP-CTHI or PP-TV
 - Examine distribution for normality. Fit sigmoid cdf as check.
- ♦ Build MW load models, 1999 to 2008
 - First fit linear, cubic or quadratic models in terms of MW & CTHI or TV
 - Obtain Design MW (50th percentile) for each year using mean PP-CTHI
 - Construct Per-Unit MW models for representative years
 - Either average of representative years for 2010 PU model or build specific model
- ♦ Construct LFU bins
 - Convert 1-3 forecast to 1-2 as appropriate, using $TV(50^{th}) + .431 * \sigma(TV)$
 - Truncate TV or CTHI for $Z > |2.0|$
- ♦ Develop Charts & Graphics
- ♦ Review & check results

(2) Zone K Results

LIPA Weather Response Function



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LIPA Supporting Detail

Mean	2009	± 1 SD		± 2 SD		± 3 SD	
		MW	PU	MW	PU	MW	PU
	5,474	5,828	1.0646	6,181	1.1293	6,334	1.1572
		5,120	0.9354	4,766	0.8707	4,613	0.8428

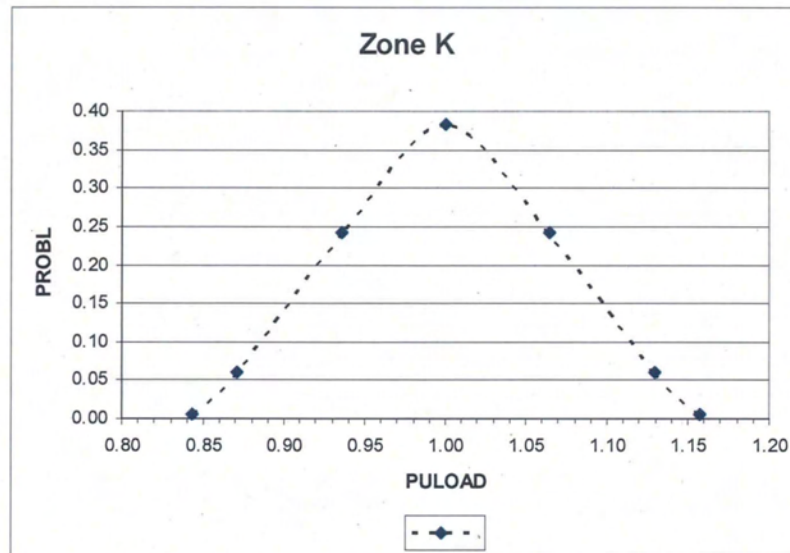
	xSD	probability	probability bands
High	6,349	3.5	0.9998
Low	6,293	2.5	0.9938
			0.0060
High	6,293	2.5	0.9938
Low	6,004	1.5	0.9332
			0.0606
High	6,004	1.5	0.9332
Low	5,651	0.5	0.6915
			0.2417
High	5,651	0.5	0.6915
Low	5,297	-0.5	0.3085
			0.3830
High	5,297	-0.5	0.3085
Low	4,943	-1.5	0.0668
			0.2417
High	4,943	-1.5	0.0668
Low	4,654	-2.5	0.0062
			0.0606
High	4,654	-2.5	0.0062
Low	4,598	-3.5	0.0002
			0.0060

Sigma	MW
-4.0	4,592
-3.5	4,598
-3.0	4,613
-2.5	4,654
-2.0	4,766
-1.5	4,943
-1.0	5,120
-0.5	5,297
0.0	5,474
0.5	5,651
1.0	5,828
1.5	6,004
2.0	6,181
2.5	6,293
3.0	6,334
3.5	6,349
4.0	6,355

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LIPA Results



LIPA PULOAD	1.1572	1.1293	1.0646	1.0000	0.9354	0.8707	0.8428
PROBLD	0.0060	0.0606	0.2417	0.3830	0.2417	0.0606	0.0060

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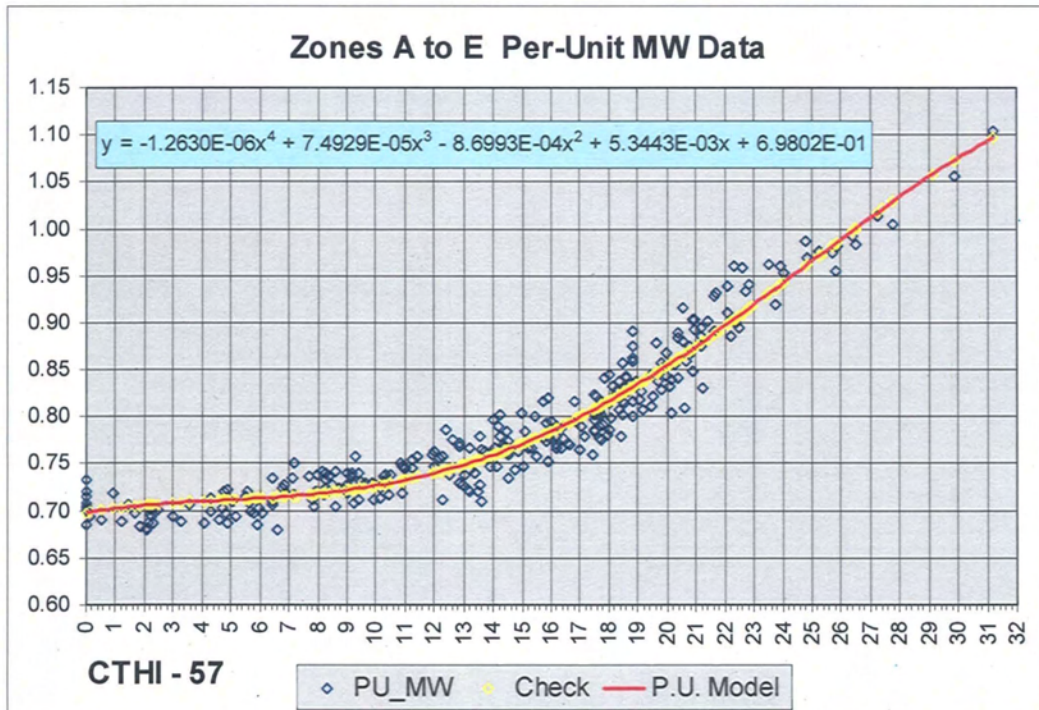
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(3) Rest of State Results

- ◆ NYISO recommends the following distribution for Zones A through G & NYSEG portion of H
 - NYISO updated weather response for these zones.
 - NYISO employed same methodology as in Zone K.
 - Comparison to 2009 LFU is very similar.

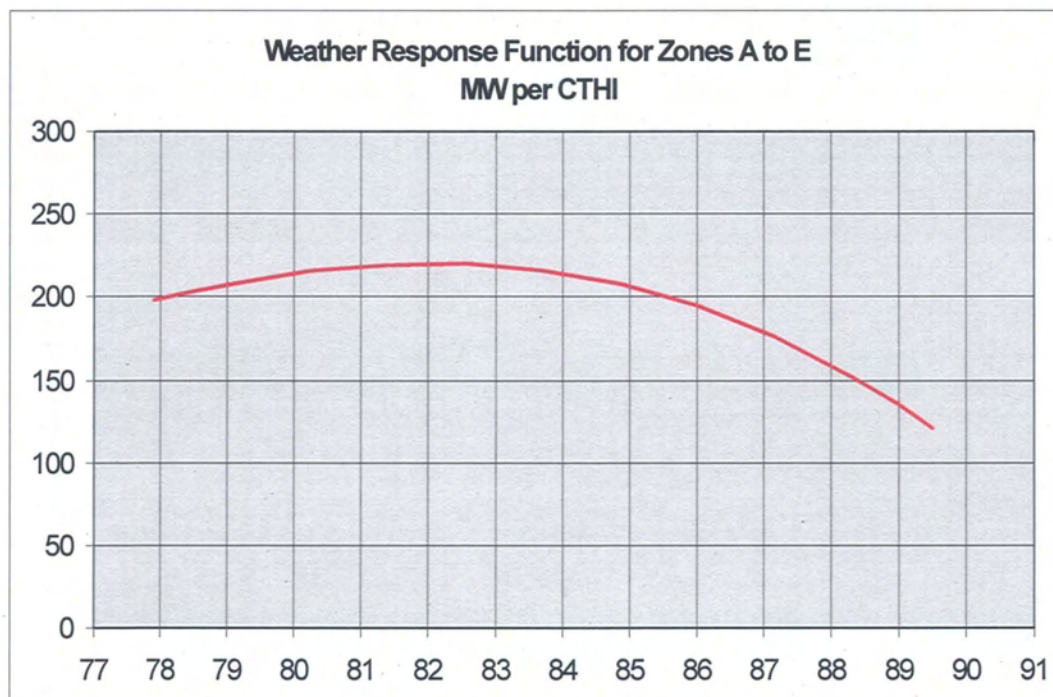
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Zone A to E – Supporting Detail

PPCTHI	83.71
Sigma	2.30

TREF	57
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Parameters	PU Model
A0	6.929E-01
A1	0.0053443
A2	-0.0008699
A3	7.4929E-05
A4	-1.263E-06
2010 MW	9406

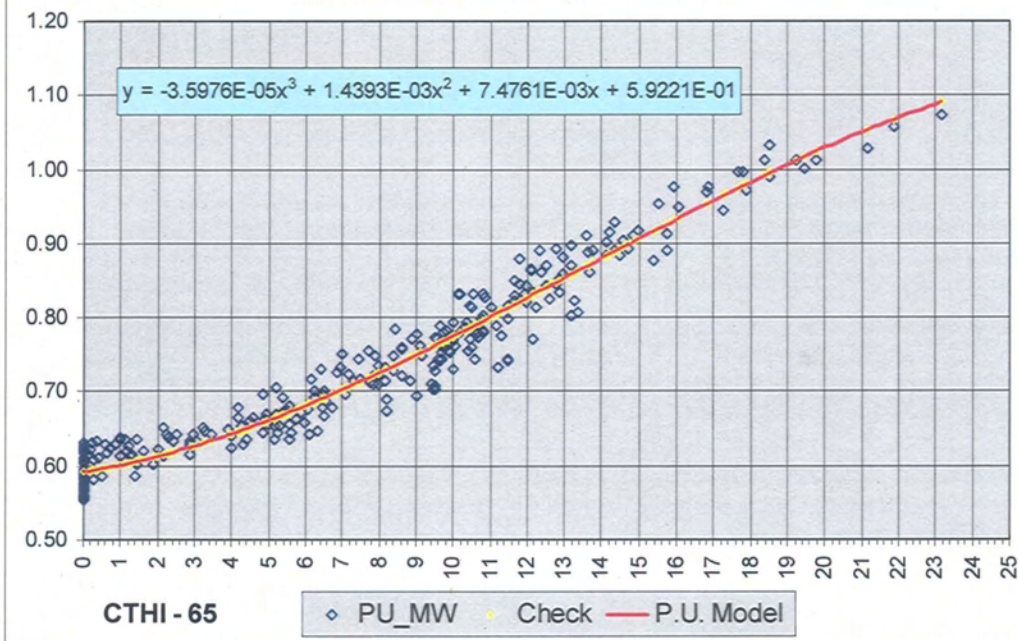
WR Model
5.344E-03
-1.740E-03
2.248E-04
-5.052E-06

Z	Cum Distribution	CTHI per Bin	P.U.MW	2010 MW	Bin Delta MW	Bin Delta CTHI	Bin MW/CTHI	Model MW/CTHI
-3.00	0.00135	77.90	0.8677	8161	100	0.50	200	198
-2.50	0.00621	78.40	0.8783	8261	146	0.71	206	203
-2.00	0.02275	79.11	0.8938	8407	244	1.15	212	208
-1.50	0.06681	80.26	0.9198	8652	250	1.15	218	216
-1.00	0.15866	81.41	0.9464	8902	253	1.15	220	219
-0.50	0.30854	82.56	0.9733	9155	251	1.15	218	220
0.00	0.50000	83.71	1.0000	9406				216
0.50	0.69146	84.86	1.0260	9650	244	1.15	212	208
1.00	0.84134	86.01	1.0506	9882	232	1.15	202	195
1.50	0.93319	87.16	1.0734	10096	214	1.15	186	176
2.00	0.97725	88.31	1.0935	10285	189	1.15	165	152
2.50	0.99379	89.00	1.1040	10385	99	0.69	144	135
3.00	0.99865	89.50	1.1108	10448	64	0.50	128	120

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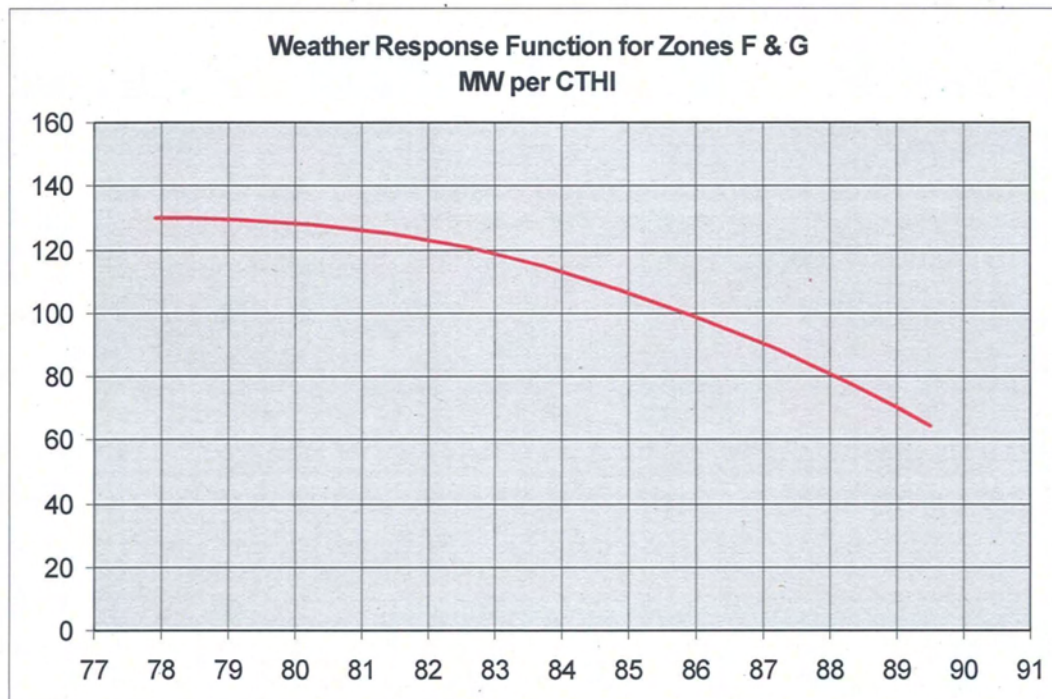
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Zones F & G Per- Unit MW Data



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Zone F & G – Supporting Detail

PPCTHI	83.71
Sigma	2.30

TREF	65
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Parameters	PU Model
A0	5.919E-01
A1	7.476E-03
A2	1.439E-03
A3	-3.598E-05
A4	0.000E+00
2010 MW	4872

WR Model
7.476E-03
2.879E-03
-1.079E-04

Z	Cum Distribution	CTHI per Bin	P.U.MW	2010 MW	Bin Delta MW	Bin Delta CTHI	Bin MW/CTHI	Model MW/CTHI
-3.00	0.00135	77.90	0.8506	4144	65	0.50	130	130
-2.50	0.00621	78.40	0.8640	4209	92	0.71	130	130
-2.00	0.02275	79.11	0.8829	4301	148	1.15	129	130
-1.50	0.06681	80.26	0.9133	4450	146	1.15	127	128
-1.00	0.15866	81.41	0.9432	4595	141	1.15	123	125
-0.50	0.30854	82.56	0.9722	4737	135	1.15	118	121
0.00	0.50000	83.71	1.0000	4872				115
0.50	0.69146	84.86	1.0263	5000	128	1.15	111	108
1.00	0.84134	86.01	1.0507	5119	119	1.15	103	99
1.50	0.93319	87.16	1.0729	5227	108	1.15	94	89
2.00	0.97725	88.31	1.0926	5323	96	1.15	83	78
2.50	0.99379	89.00	1.1030	5374	51	0.69	74	70
3.00	0.99865	89.50	1.1099	5408	34	0.50	67	64

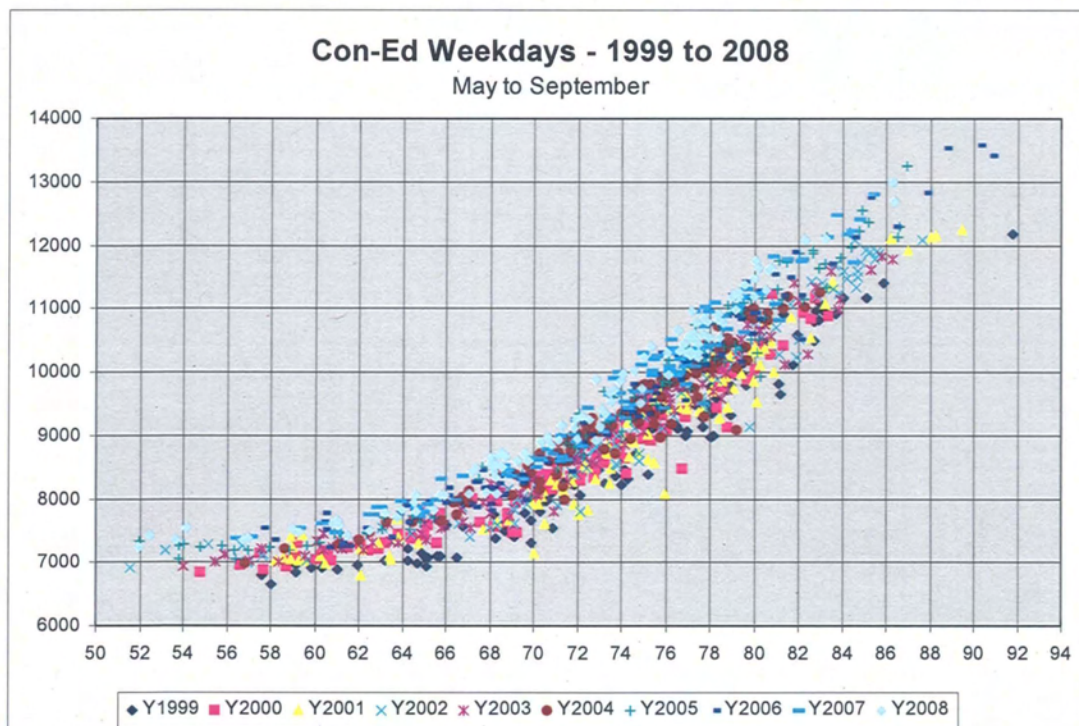
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(4) Results for Zones J, H & I

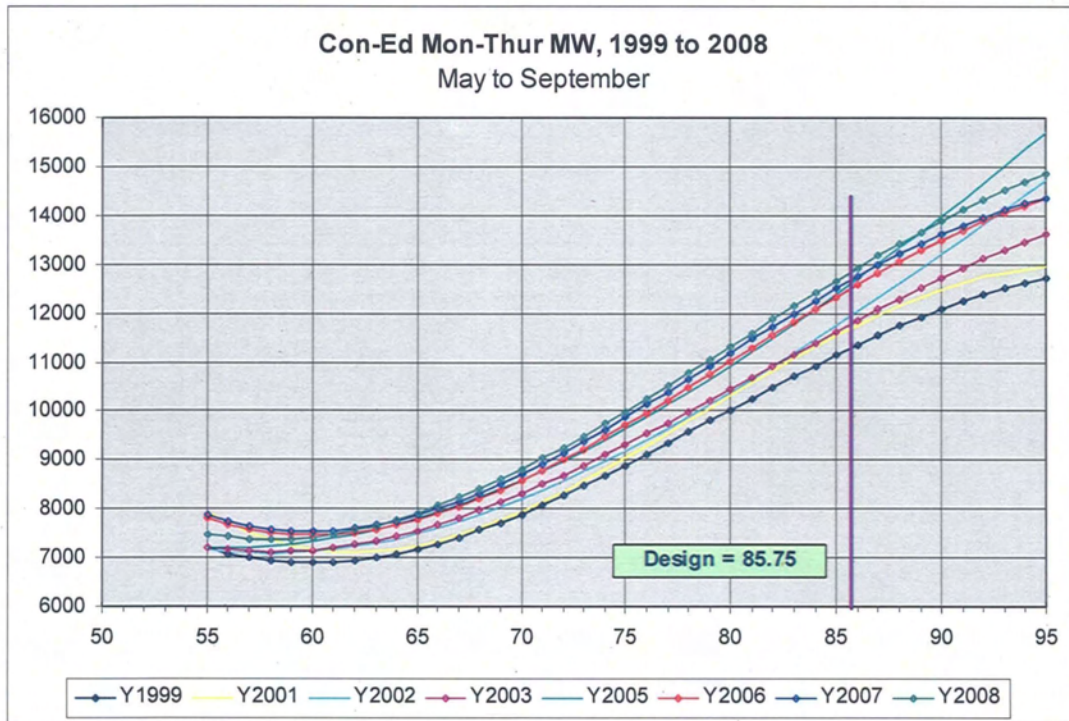
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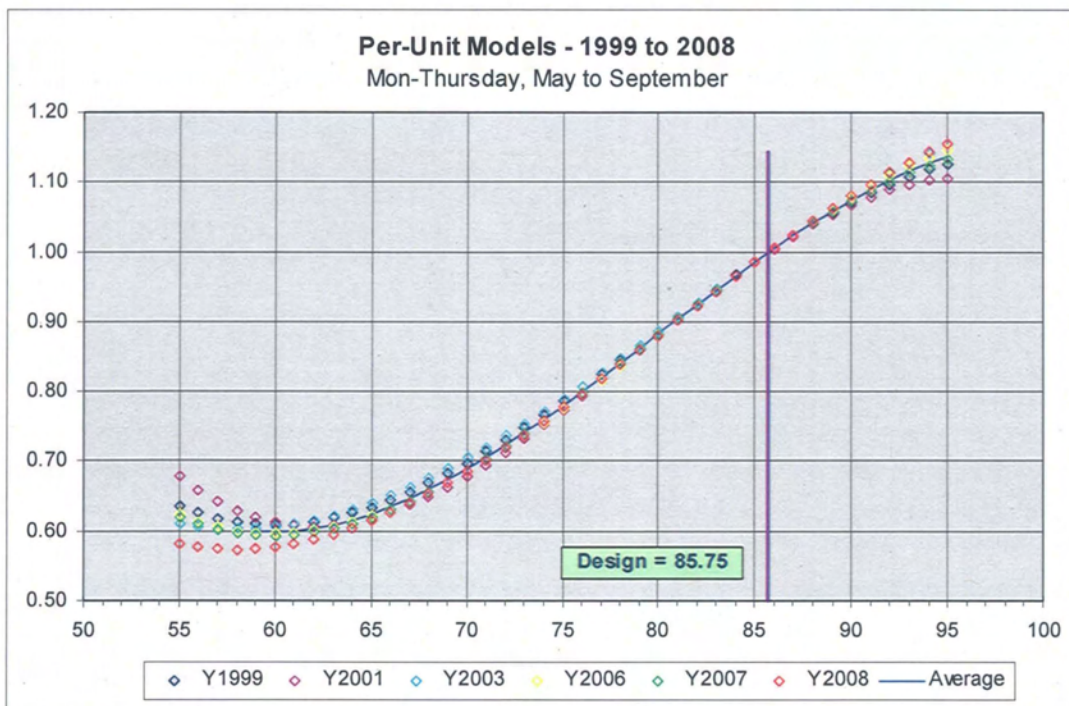
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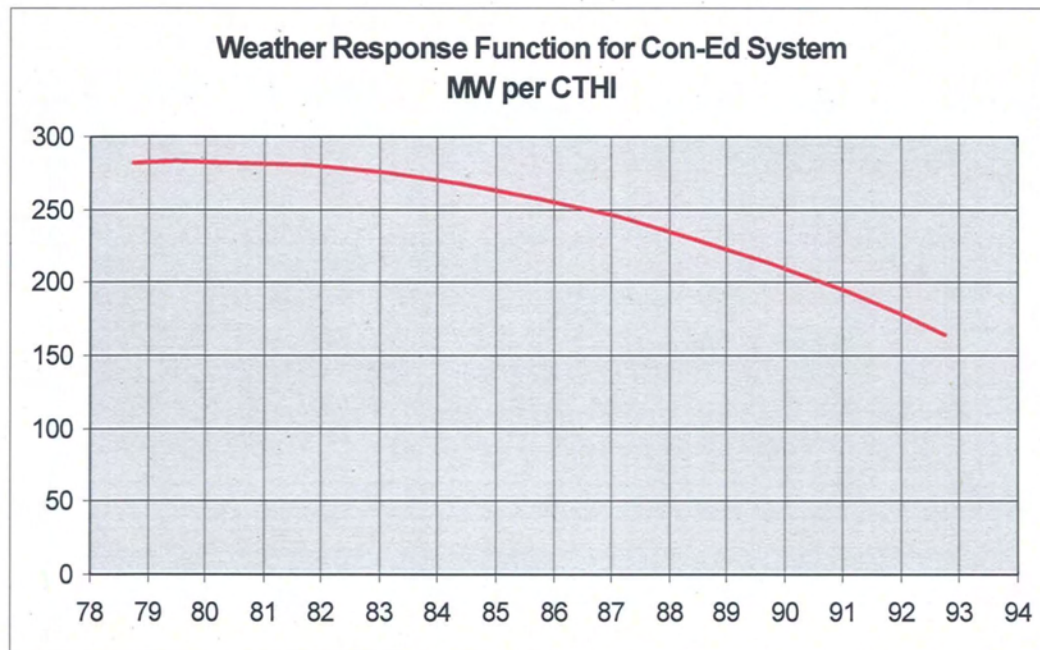
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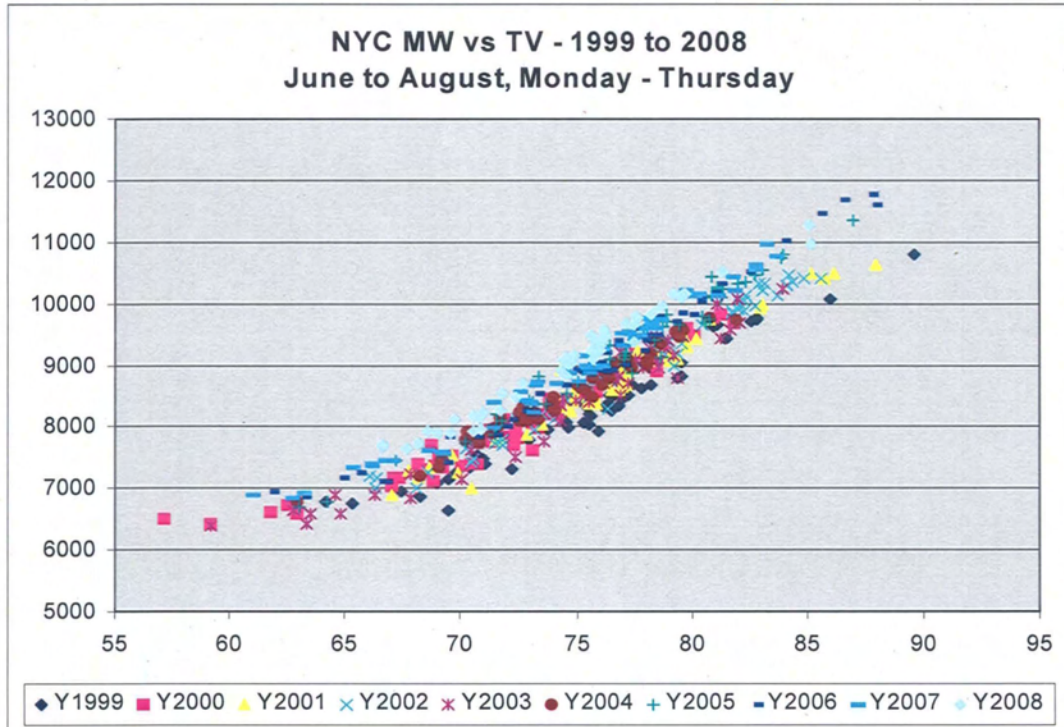
Con-Ed System – Supporting Detail

PPCTHI		85.75	Load Model		Derivative	
Sigma		2.66	A0	8.095E+00	-3.13E-01	
			A1	-3.132E-01	8.37E-03	
			A2	4.187E-03	-5.25E-05	
			A3	-1.748E-05	5.55E-17	
			A4	1.388E-17		
			MW	13460 : 50th pct		
			MW	13750 : 67th pct		

Z	Cum Prob	CTHI(X)	PU @ 50th	2010 MW	dMW	dCTHI	MW/CTHI from Bins	MW/CTHI from eqn	PU @ 67th
-3.000	0.00135	78.75	0.8567	11531	212	0.75	282	282	0.8386
-2.500	0.00621	79.50	0.8724	11742	263	0.93	283	283	0.8540
-2.000	0.02275	80.43	0.8919	12005	374	1.33	281	282	0.8731
-1.500	0.06681	81.76	0.9197	12380	370	1.33	278	280	0.9003
-1.000	0.15866	83.09	0.9472	12749	361	1.33	272	275	0.9272
-0.500	0.30854	84.42	0.9740	13111	350	1.33	263	268	0.9535
0.000	0.50000	85.75	1.0000	13460			258	258	0.9789
0.500	0.69146	87.08	1.0249	13796	335	1.33	252	246	1.0033
1.000	0.84134	88.41	1.0485	14113	317	1.33	238	231	1.0264
1.500	0.93319	89.74	1.0704	14408	296	1.33	222	213	1.0479
2.000	0.97725	91.07	1.0906	14679	271	1.33	204	193	1.0676
2.500	0.99379	92.00	1.1034	14852	173	0.93	186	178	1.0801
3.000	0.99865	92.75	1.1130	14980	129	0.75	171	165	1.0895

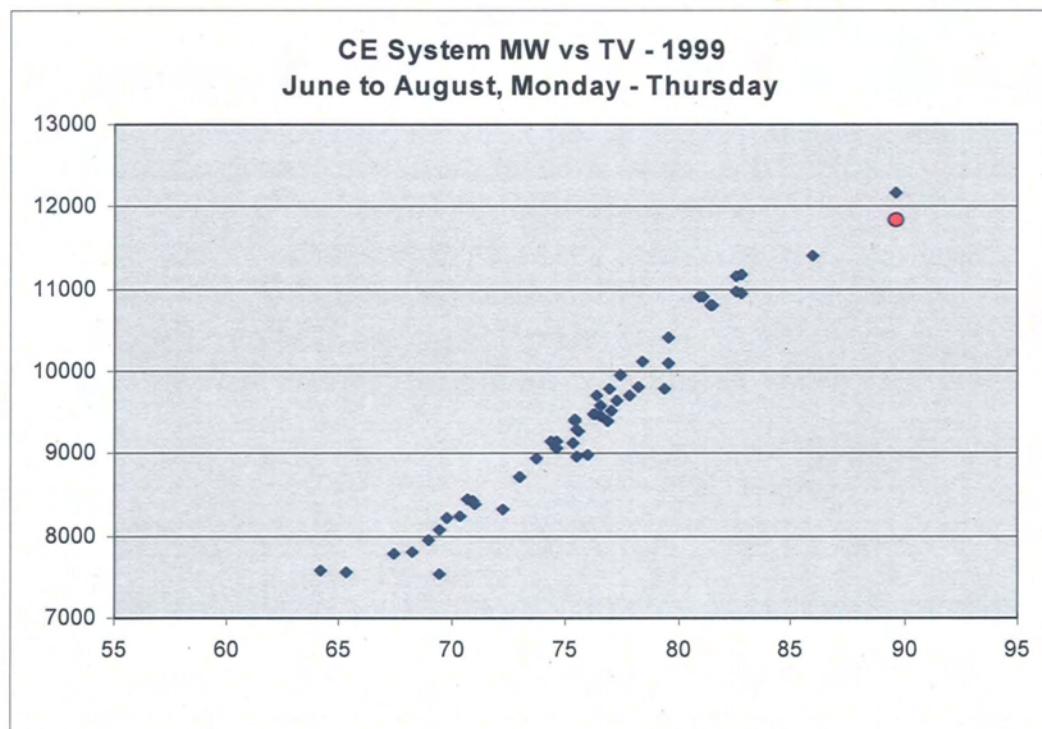
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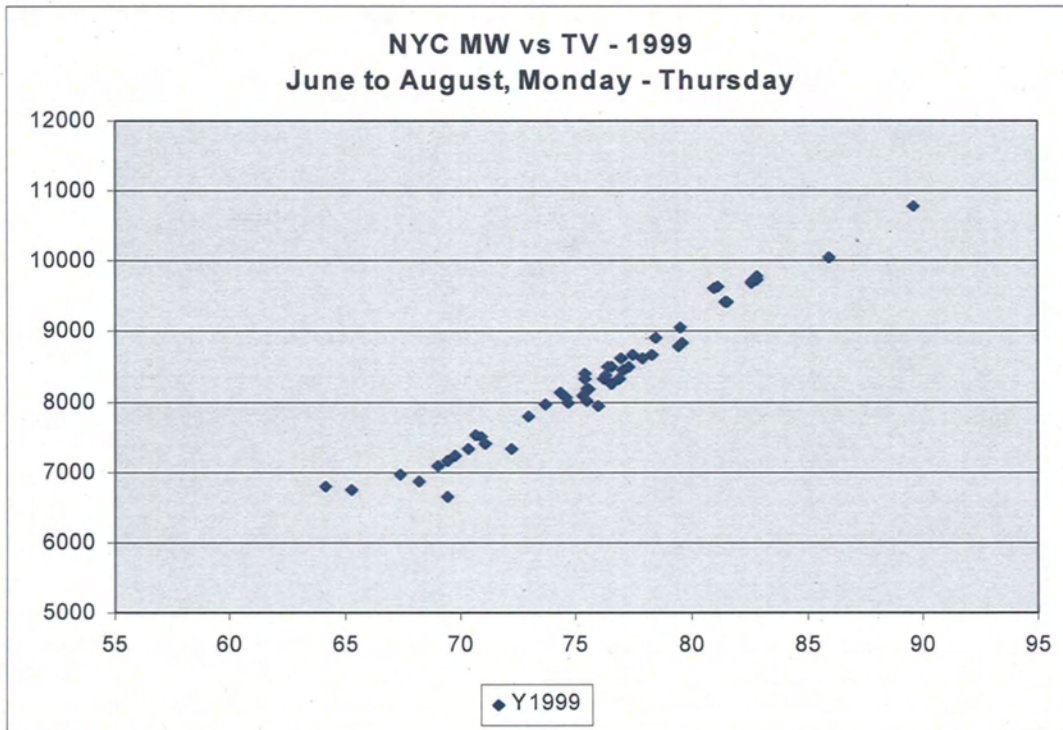
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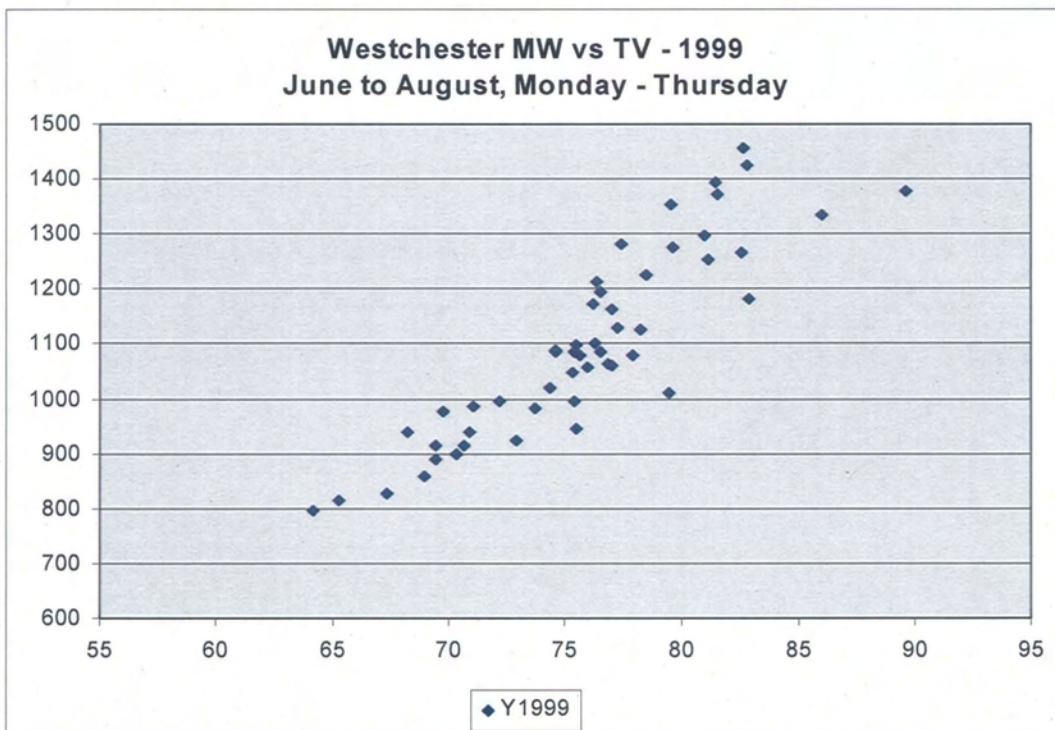
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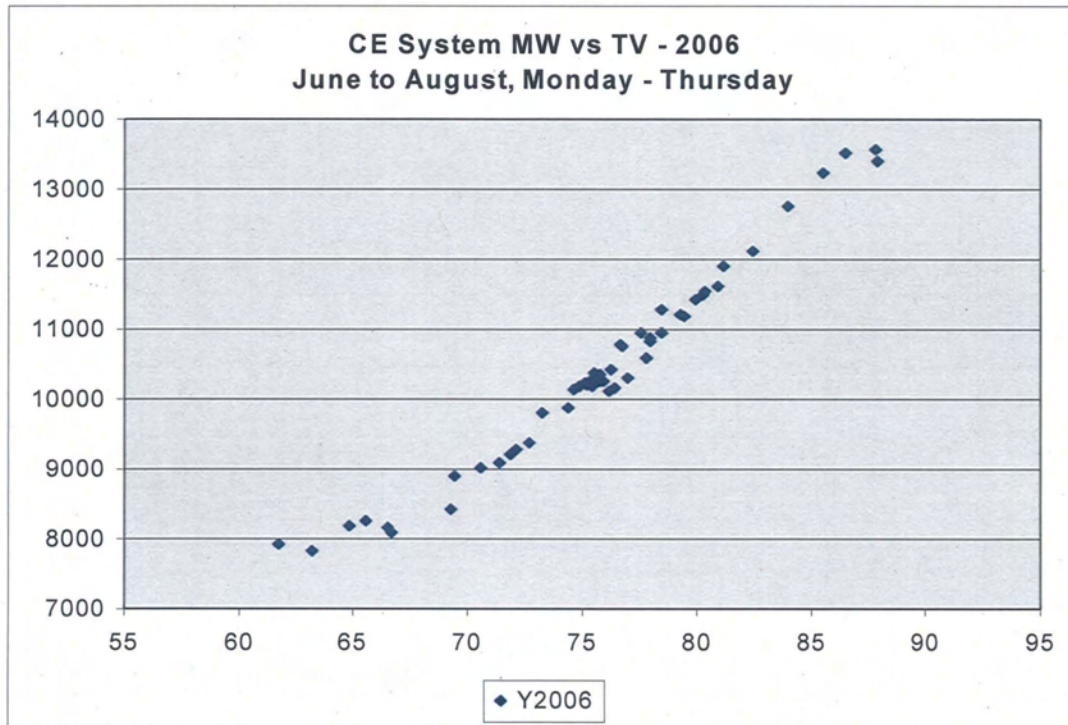
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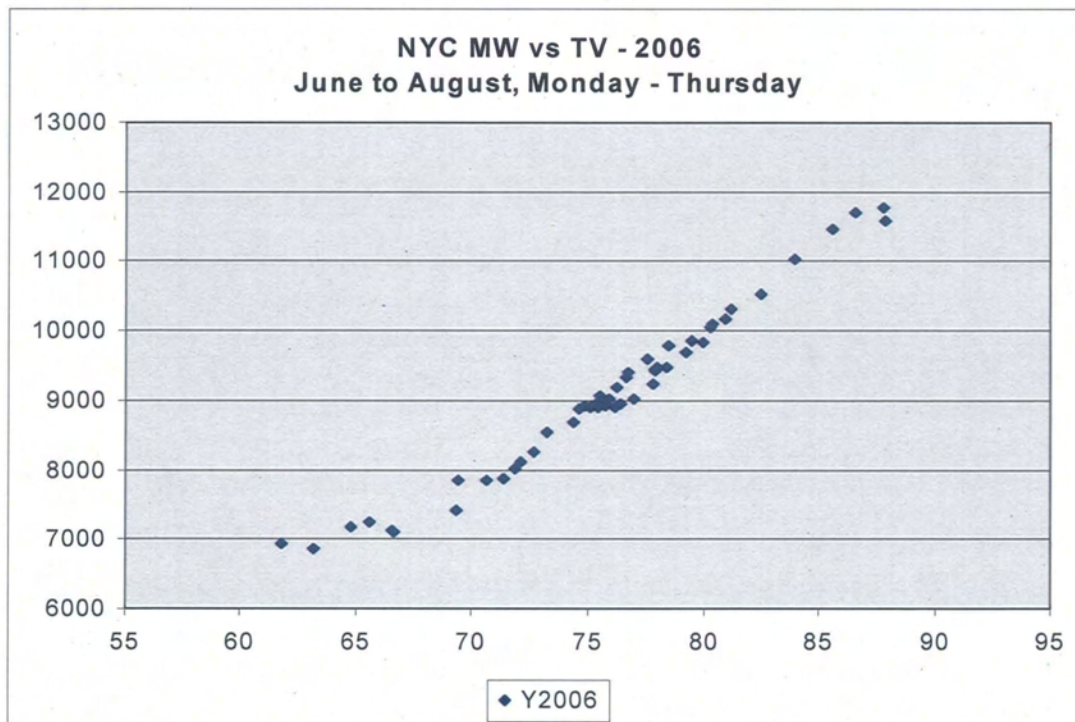
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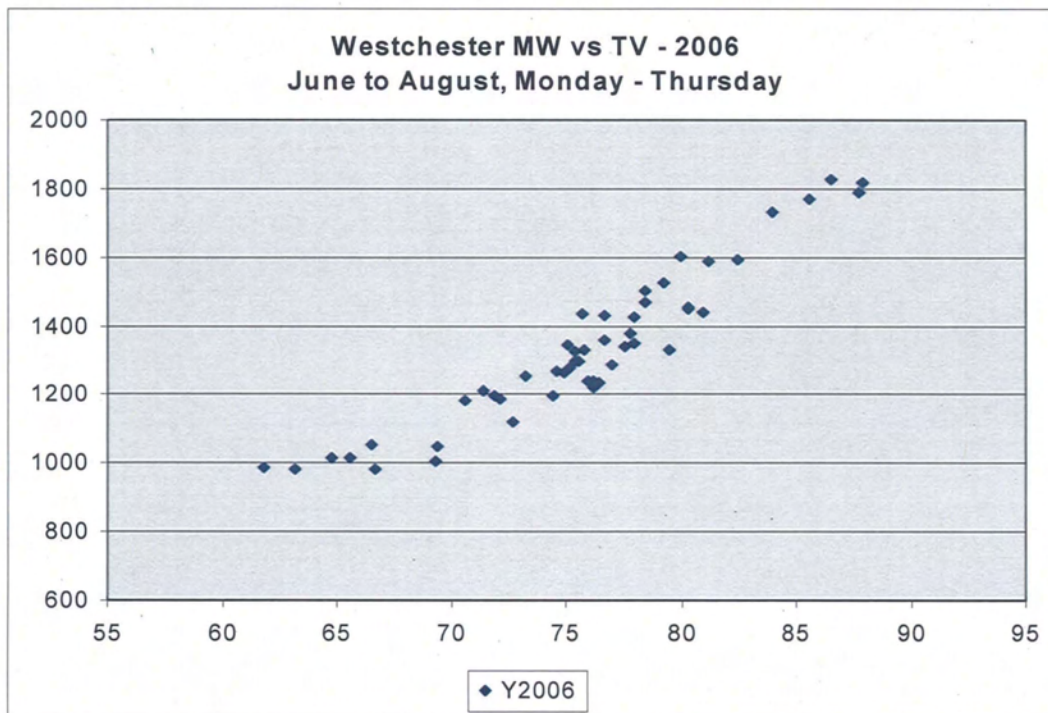
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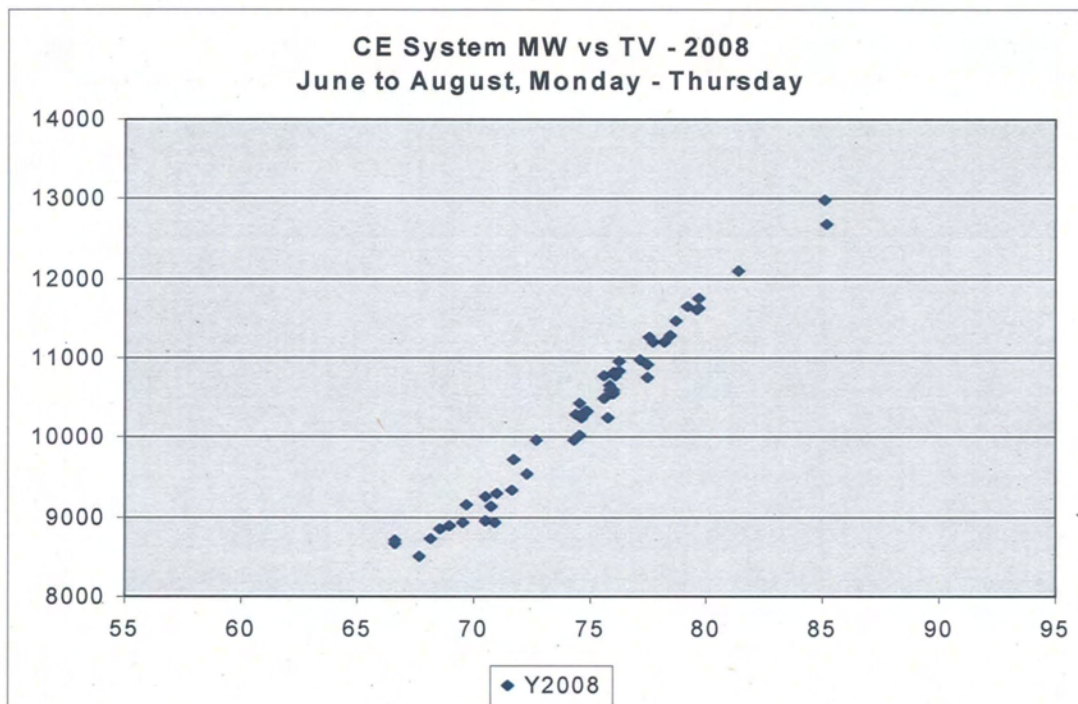
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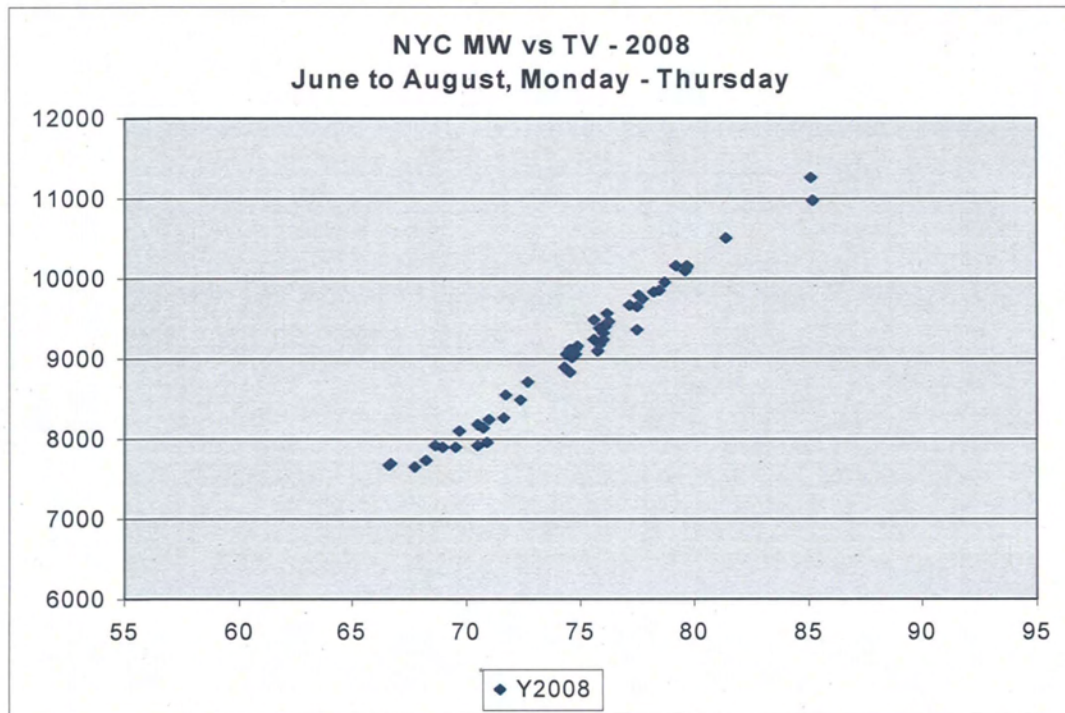
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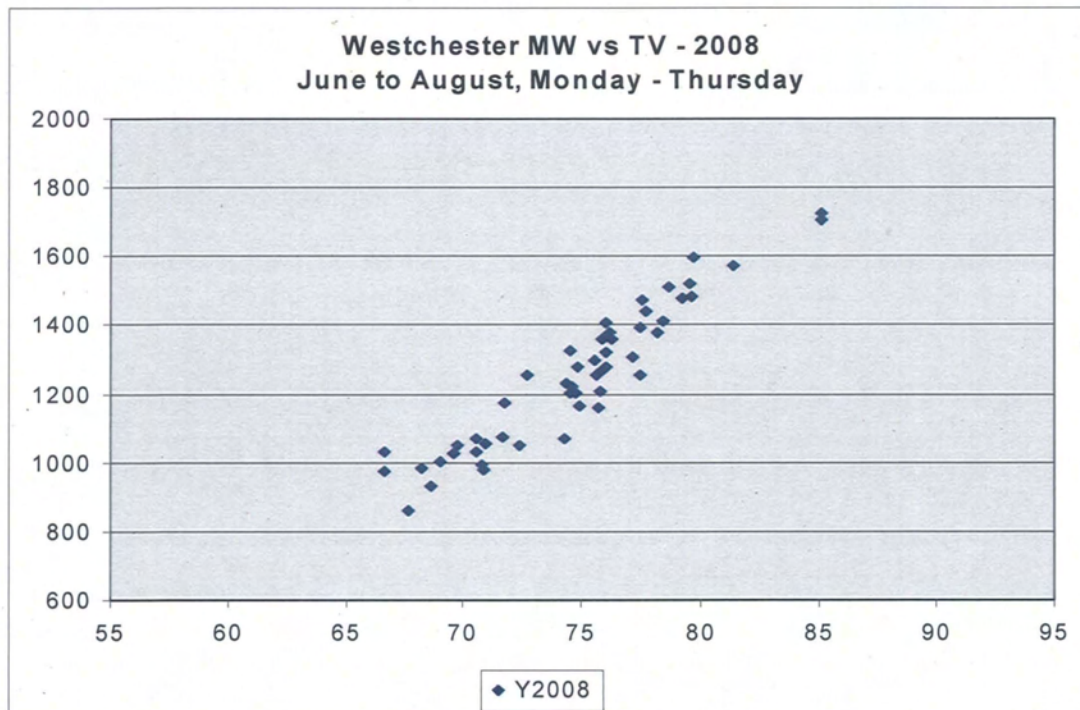
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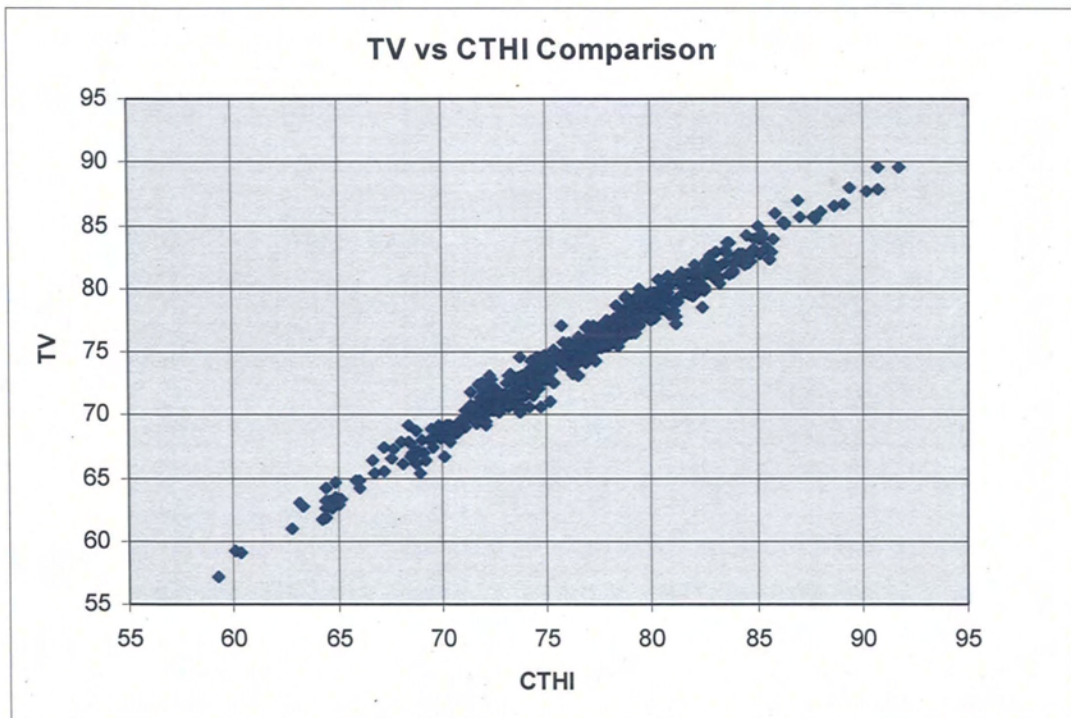
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