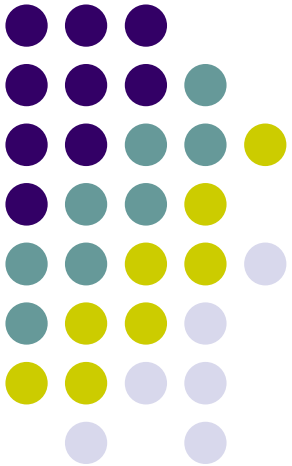
Load Research Status

Presentation to the

Load Research/Forecasting Working Group

June 3rd, 2010



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Presentation Format

1. Current status of Load Research at Rocky Mountain Power
2. What is Load Research?
3. Issues to be addressed by the working group
   - Load Research sampling (A Study in Philosophy, Science and Art)
   - Comparison of class load estimates to billing data
   - What do we do with irrigation?
   - Forecasting class loads
   - Weather normalization of class loads
   - The calibration conundrum

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Status Report

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Utah

Class/Schedule	Data Source	Design Criteria	Sample Size	Install Date
Sch 001	Stratified random sample	90/5	170	October 2008
Sch 006	Stratified random sample	90/10	108	January 2009
Sch 023	Stratified random sample	90/10	75	October 2008
Sch 010	Stratified random sample	90/10	130	May 2006
Sch 008	Direct Measurement	Census	Census	Ongoing
Sch 009	Direct Measurement	Census	Census	Ongoing
Sch 021	Direct Measurement	Census	Census	Ongoing
Sch 031	Direct Measurement	Census	Census	Ongoing

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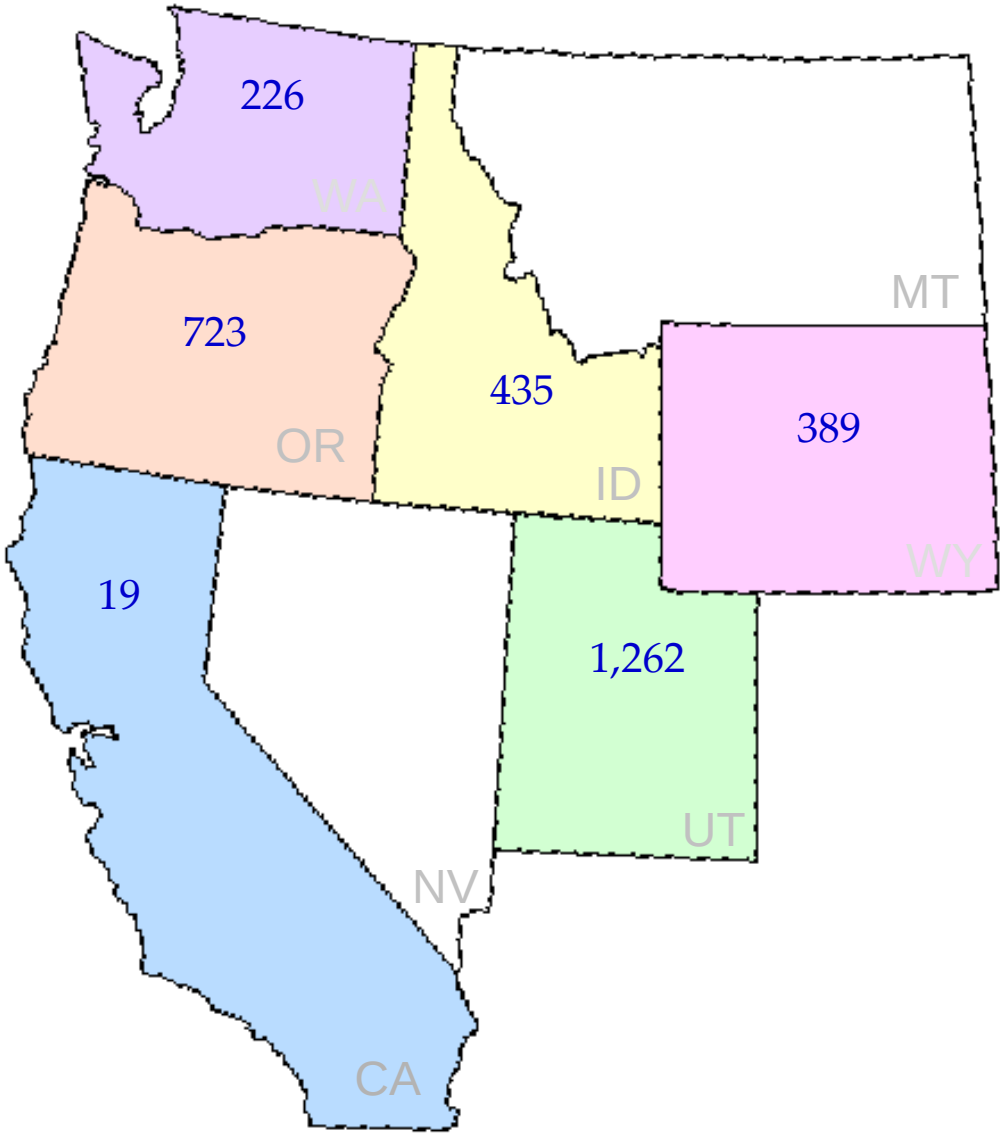
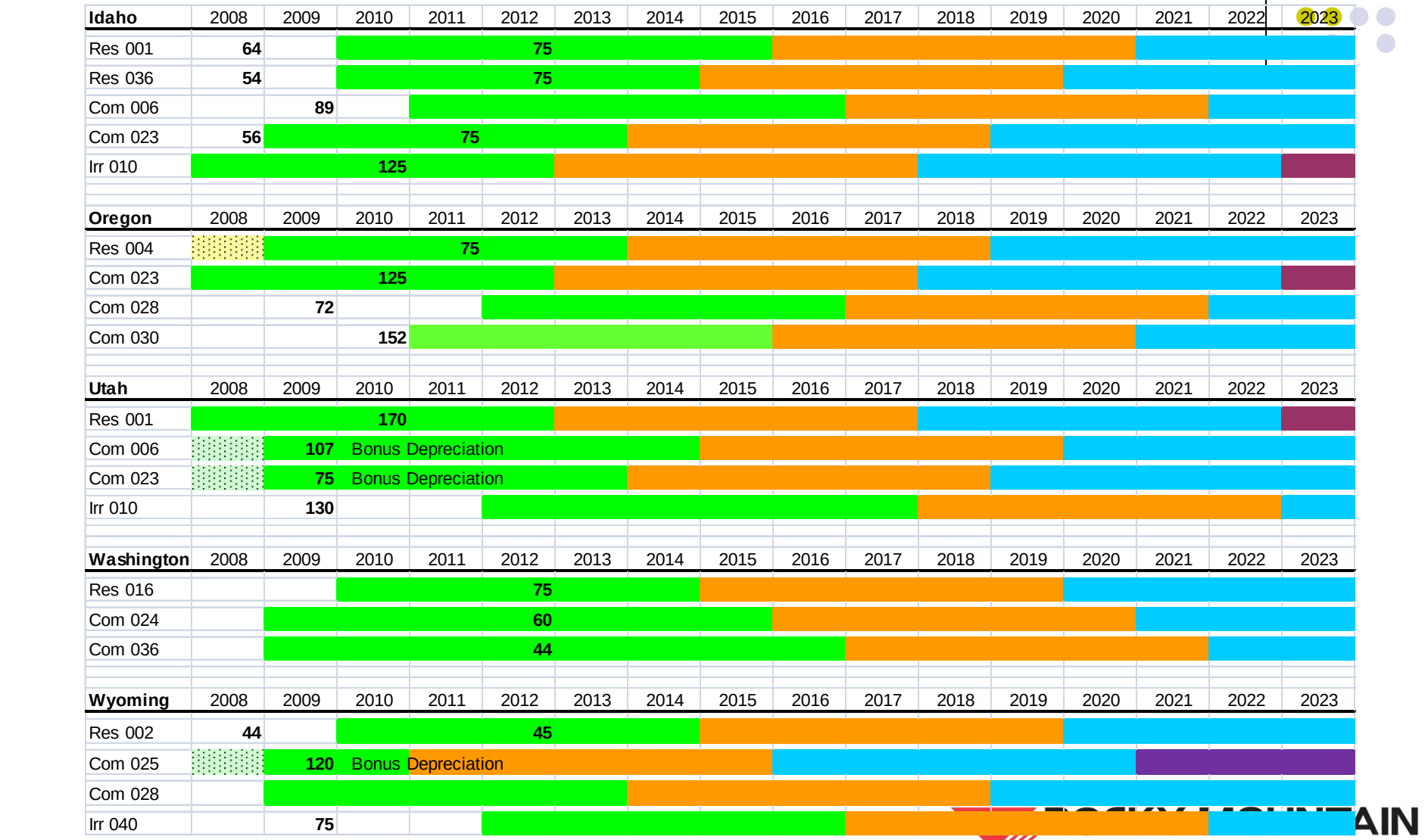
Load Research Meters



Load Research Meters

Sample Rotation Schedule



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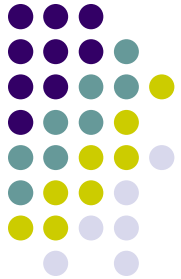
Load Research Clients & Activities



Support Organizations:

- Power Delivery Metering & Meter Reading
- CBS/Information Technology
- Regulation
- Commercial & Trading
- Forecasting

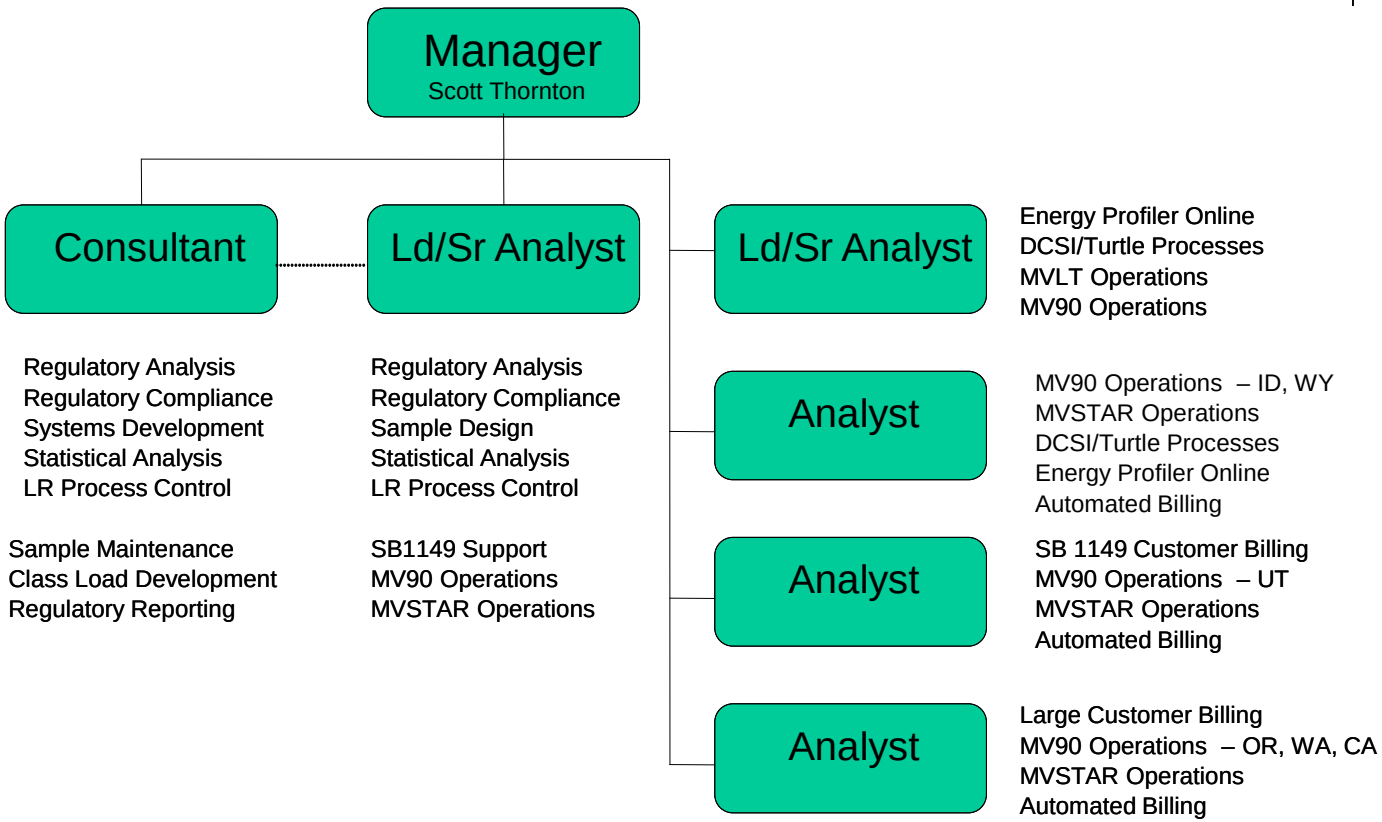
Industry Affiliations:

- Association of Edison Electric Companies (AEIC)
- Western Load Research Association (WLRA)

Client Organizations:

- Regulation
- Customer Billing
- Power Delivery Customer Service
- Power Supply
- Transmission/Wholesale Billing
- Forecasting
- Engineering
- Marketing & Demand Side/Strategic Planning
- Power Delivery Metering

Load Research Group by Work Assignment



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What is Load Research?

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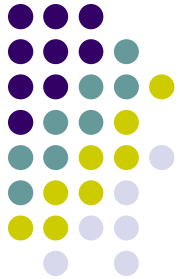
What is Load Research?



- “an activity embracing the measurement and study of the characteristics of electric loads to provide a thorough and reliable knowledge of trends, and the general behavior of load characteristics of the more important services rendered by the electrical utility.”

Association of Edison Illuminating Companies 2001

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Huh?

- “load research allows utilities to study the ways their customers use electricity, either in total or by individual end uses”

Association of Edison Illuminating Companies 2001

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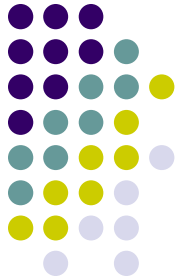
So… What is it really?



- The study of how and when our customers use energy so that PacifiCorp can most effectively:

  - Allocate Costs as per Regulatory Mandate
  - Design or Maximize Customer Rates
  - Forecast Loads
  - Service Customer Data Requests
  - Size Transformers & Distribution Circuits
  - Provide Enhanced Customer Service

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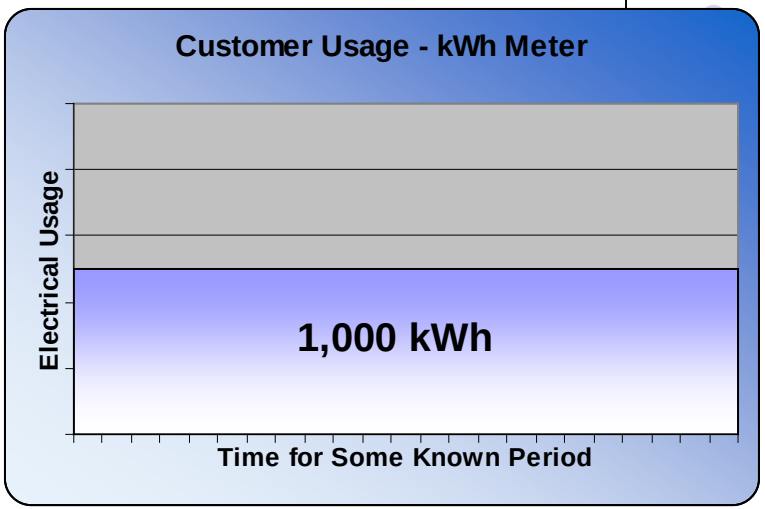
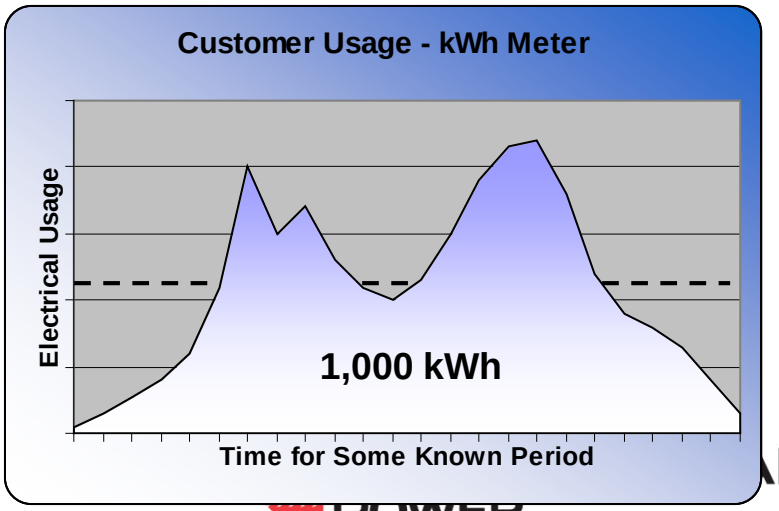
Load Shape

Electric usage varies over time and by customer type

PacifiCorp is obligated to provide electricity (load) when the customer demands (kW) and for the length of time that the customer needs it (kWh).

Load research (interval) data provides an important data input into planning, regulatory and financial decision making processes…





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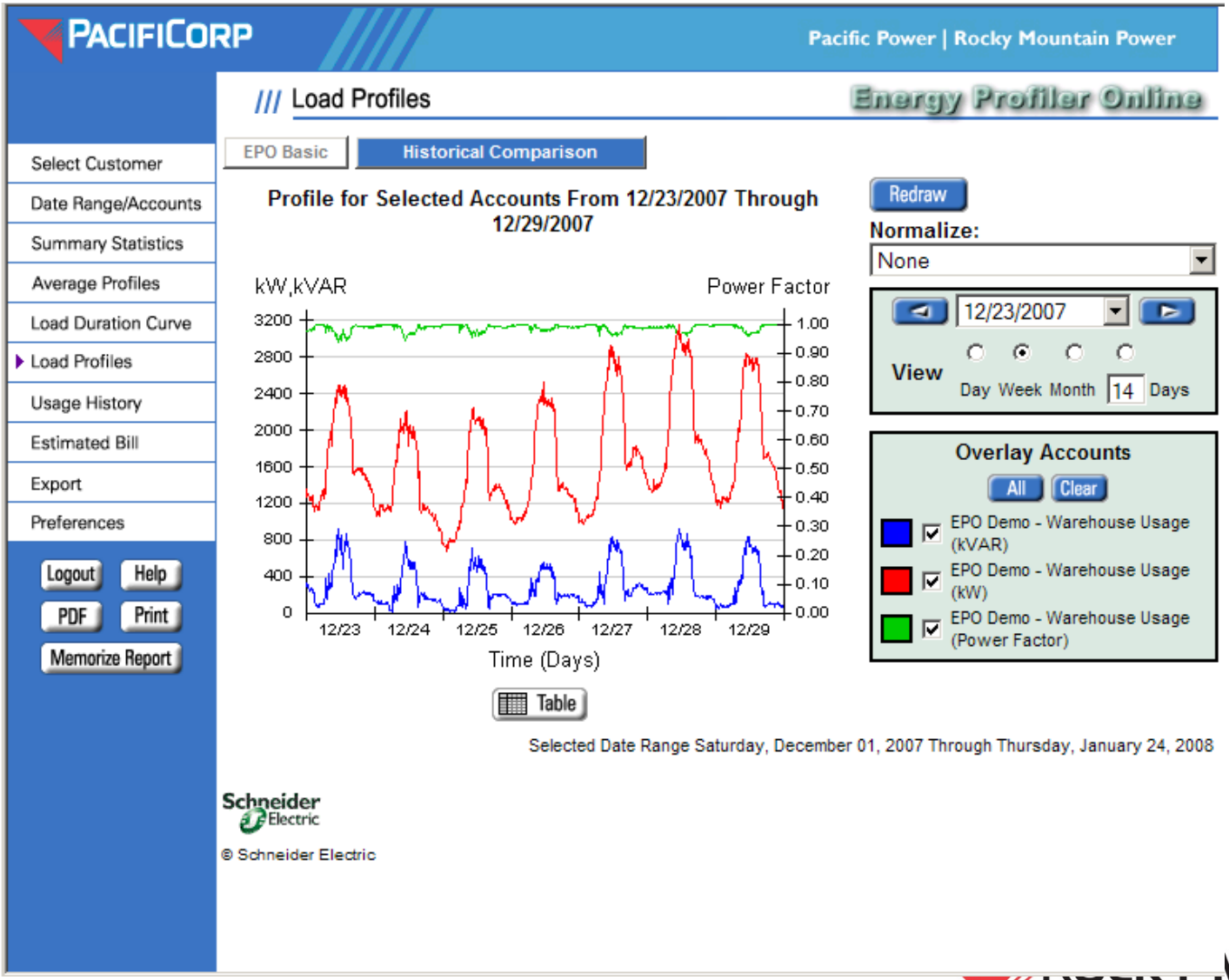
Energy Profiler Online (EPO)



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Energy Profiler Online (EPO)

Time	EPO Demo - Warehouse Usage (kVAR)	EPO Demo - Warehouse Usage (kW)	EPO Demo - Warehouse Usage (Power Factor)
12/23/2007 00:15	320	1,348	0.9730
12/23/2007 00:30	280	1,308	0.9778
12/23/2007 00:45	280	1,272	0.9766
12/23/2007 01:00	300	1,300	0.9744
12/23/2007 01:15	288	1,284	0.9758
12/23/2007 01:30	240	1,272	0.9827
12/23/2007 01:45	248	1,232	0.9803
12/23/2007 02:00	268	1,236	0.9773
12/23/2007 02:15	256	1,244	0.9795
12/23/2007 02:30	260	1,288	0.9802
12/23/2007 02:45	228	1,252	0.9838
12/23/2007 03:00	212	1,208	0.9849
12/23/2007 03:15	220	1,100	0.9806
12/23/2007 03:30	132	1,168	0.9937
12/23/2007 03:45	72	1,180	0.9981
12/23/2007 04:00	76	1,160	0.9979
12/23/2007 04:15	76	1,164	0.9979
12/23/2007 04:30	56	1,124	0.9988
12/23/2007 04:45	64	1,124	0.9984
12/23/2007 05:00	80	1,140	0.9975
12/23/2007 05:15	88	1,200	0.9973

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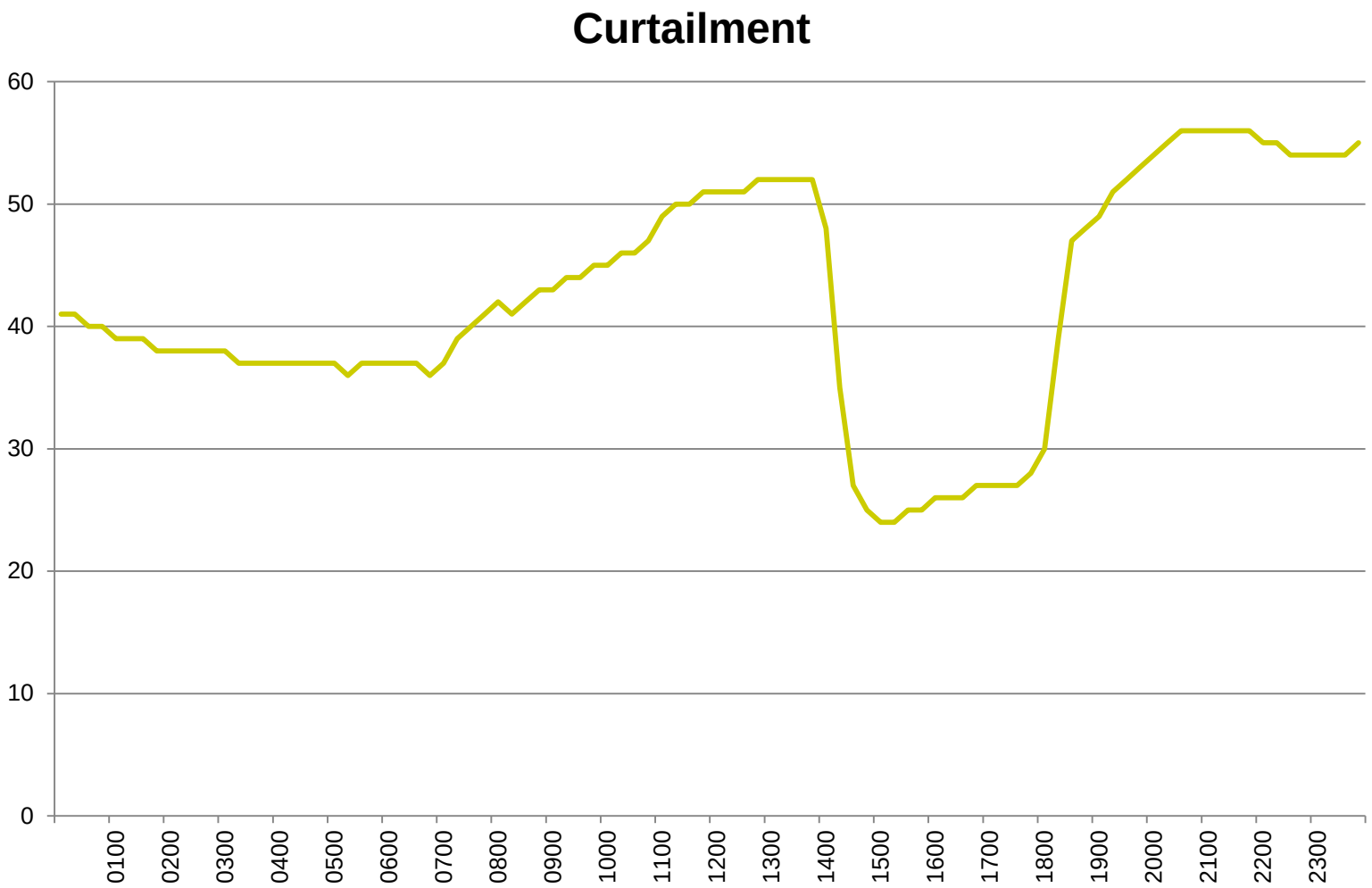

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Ad-Hoc Analysis

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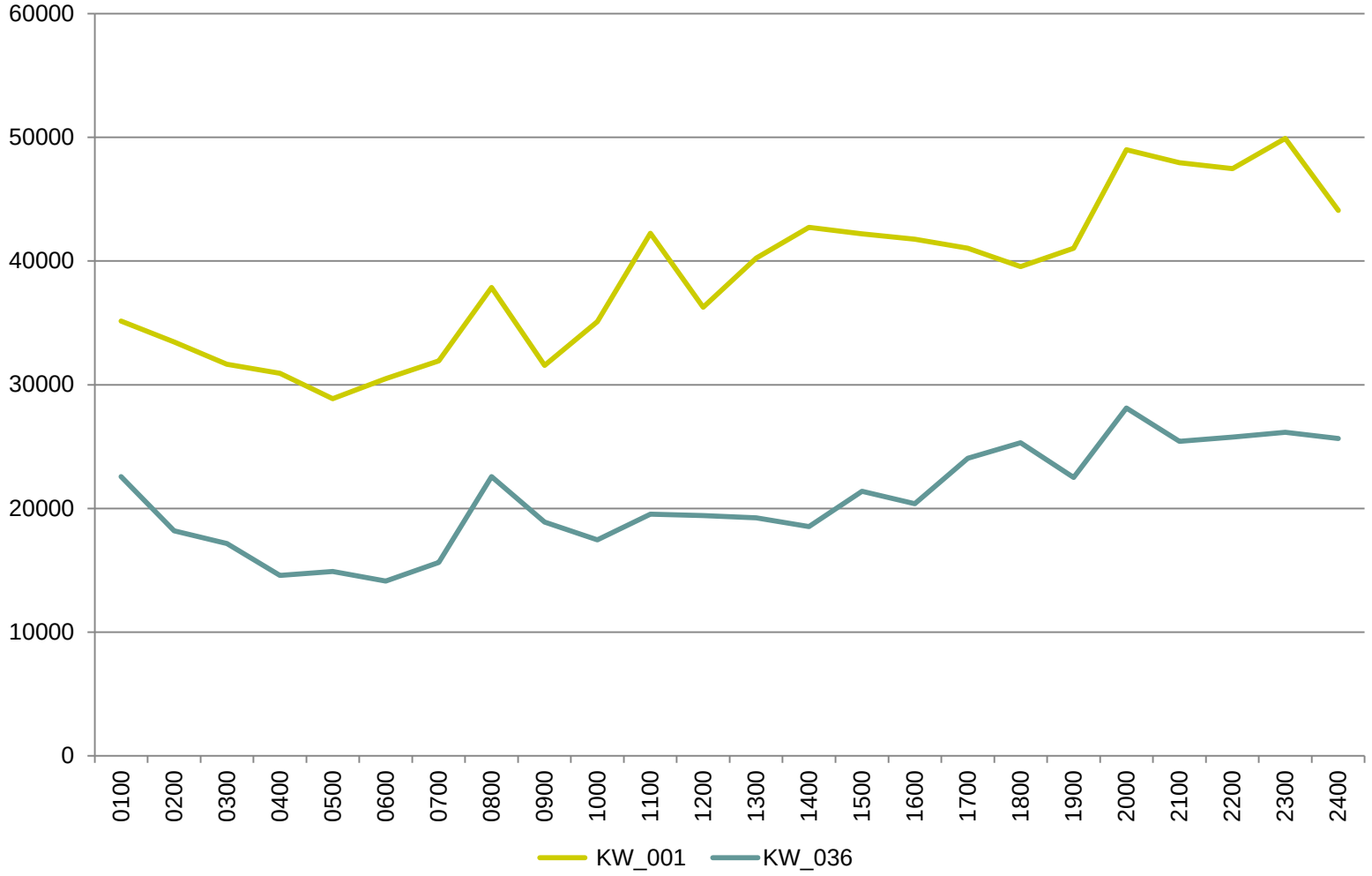
Tariff Compliance



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A brief history……

- Some utilities have performed load research since the 1930's.
- The AEIC Load Research Committee held it's first organizational meeting in 1944.
- In 1978, the Public Utilities Regulatory Policy Act (PURPA) required the utility industry to develop load research programs as a basis for cost-of-service filings with FERC and public utility commissions.

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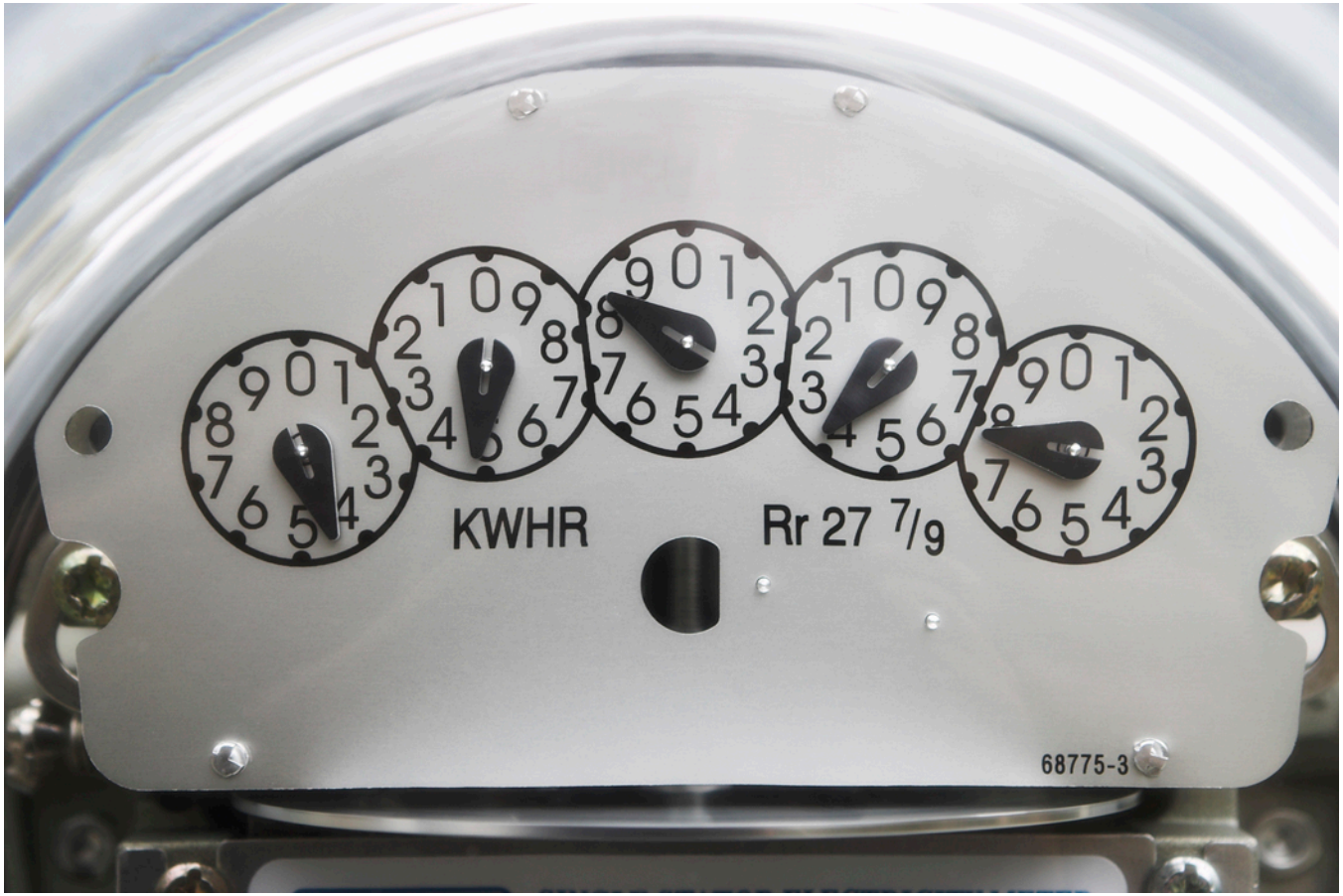
So, what is a load profiling meter?



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Load Research Sampling (A Study in Philosophy, Science and Art)

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$$n = \frac{\left(\sum W_h s_h\right)^2}{V + \frac{1}{N}\sum W_h s_h^{\,2}}$$

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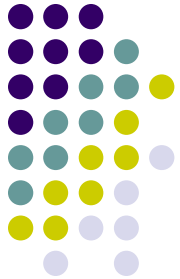
Section 133 of the 1978 Public Utilities Regulatory Policy Act (PURPA), Code of Federal Regulations (CFR), Title 18, Chapter 1, Subchapter K, Part 290.403, Subpart B



- "**Accuracy Level.** If sample metering is required, the sampling method and procedures for collecting, processing, and analyzing the sample loads, taken together, shall be designed so as to provide reasonably accurate data consistent with available technology and equipment. An accuracy of plus or minus 10 percent at the 90 percent confidence level shall be used as a target for the measurement of group loads at the time of system and customer group peaks."

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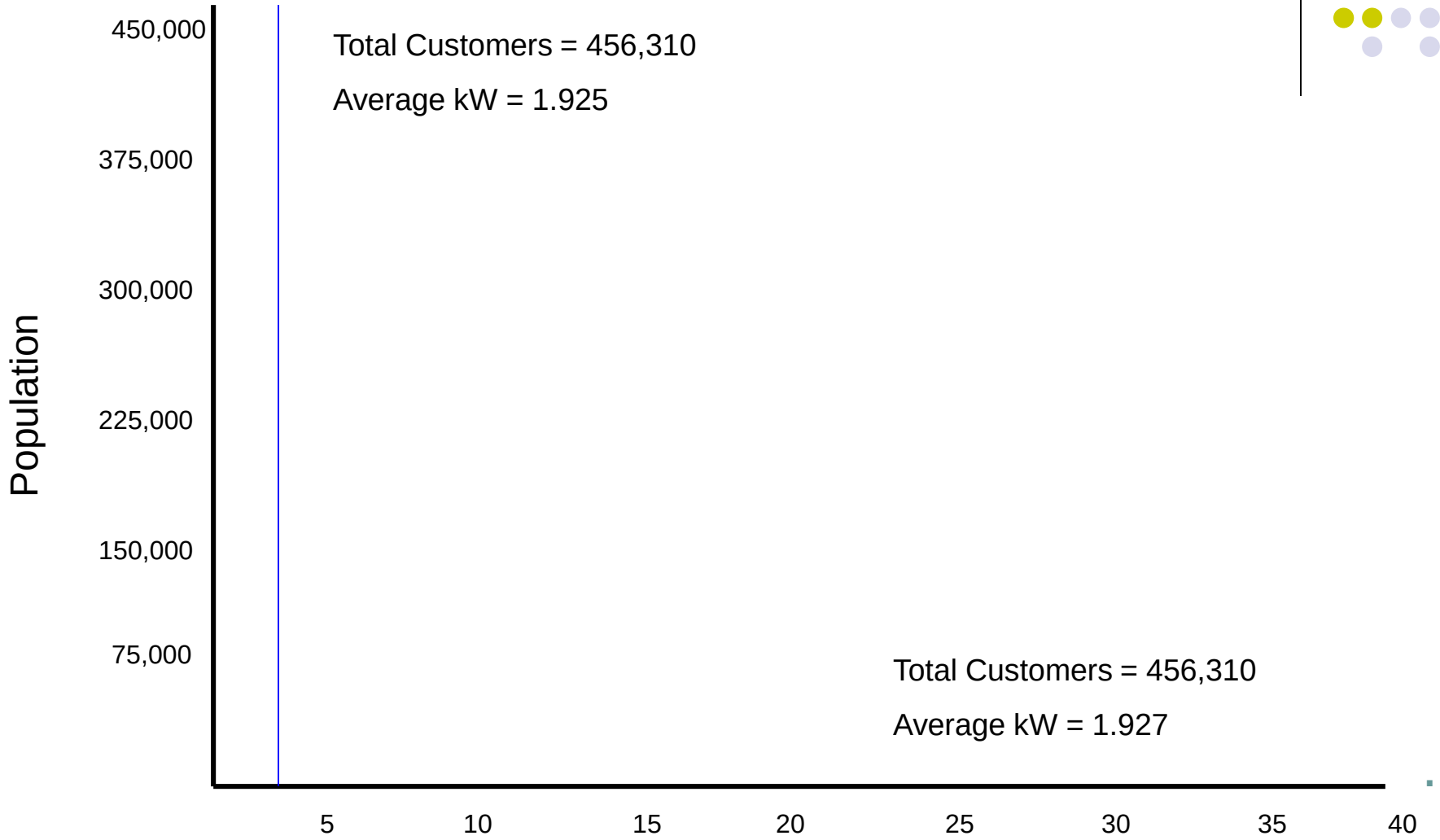
An absurdity…



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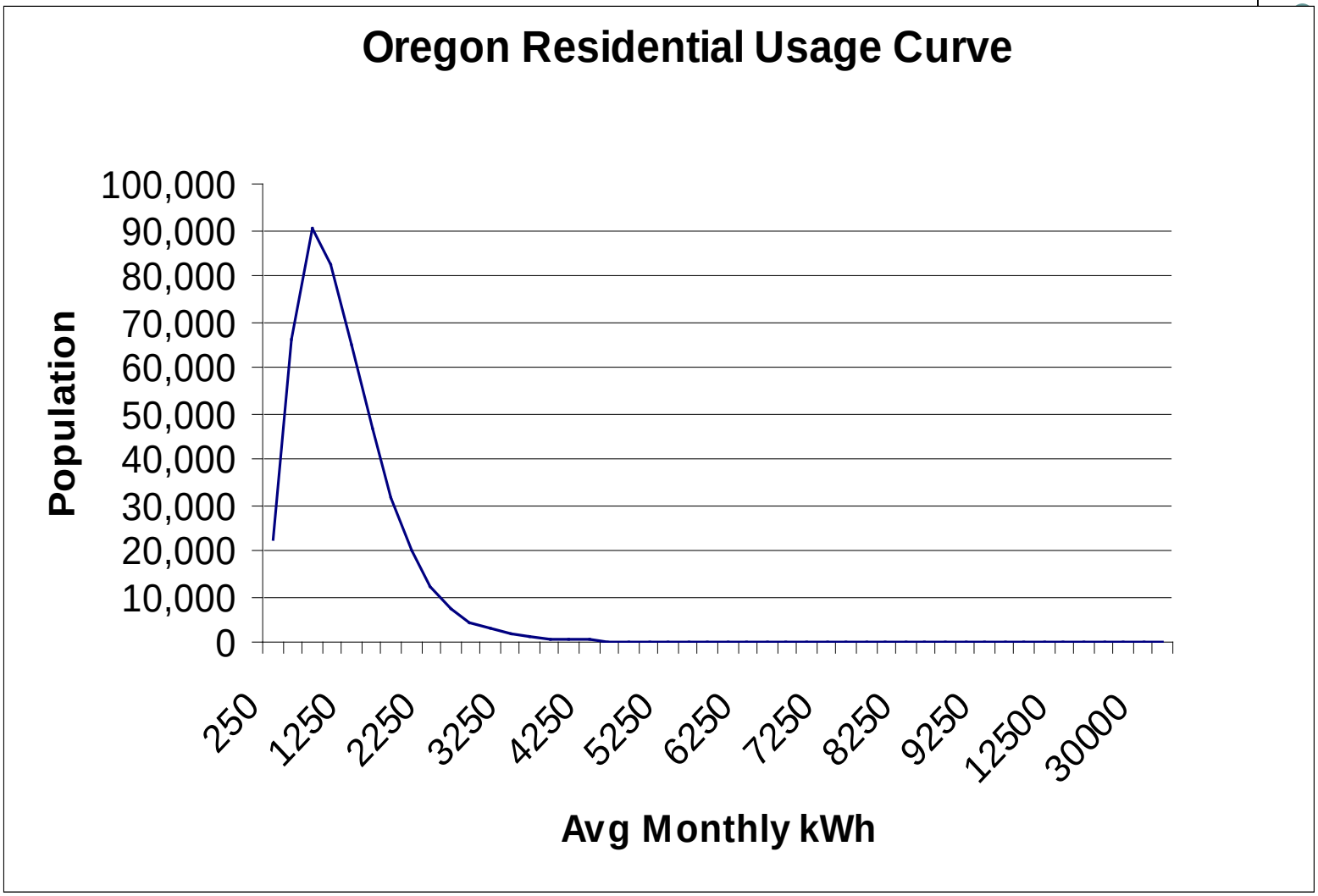

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Delanius-Hodges

Bill Frequency Analysis Summary

Oregon Residential Class DH Worksheet
Three Strata

Range			Customer Count f	Interval Factor μ	μf	$\sqrt{\mu f}$	cum $\sqrt{\mu f}$	
0	to	250	22575	1	22575	150.2	150.2	
251	to	500	66104	1	66104	257.1	407.4	
501	to	750	90169	1	90169	300.3	707.6	178,848
751	to	1000	82359	1	82359	287.0	994.6	
1001	to	1250	64719	1	64719	254.4	1,249.0	
1251	to	1500	46390	1	46390	215.4	1,464.4	
1501	to	1750	31714	1	31714	178.1	1,642.5	225,182
1751	to	2000	20013	1	20013	141.5	1,784.0	
2001	to	2250	12057	1	12057	109.8	1,893.8	
2251	to	2500	7444	1	7444	86.3	1,980.0	
2501	to	2750	4418	1	4418	66.5	2,046.5	
2751	to	3000	2758	1	2758	52.5	2,099.0	
3001	to	3250	1789	1	1789	42.3	2,141.3	
3251	to	3500	1099	1	1099	33.2	2,174.5	
3501	to	3750	738	1	738	27.2	2,201.6	
3751	to	4000	509	1	509	22.6	2,224.2	
4001	to	4250	354	1	354	18.8	2,243.0	
4251	to	4500	247	1	247	15.7	2,258.7	
4501	to	4750	186	1	186	13.6	2,272.4	
4751	to	5000	133	1	133	11.5	2,283.9	
5001	to	5250	105	1	105	10.2	2,294.1	
5251	to	5500	75	1	75	8.7	2,302.8	
5501	to	5750	60	1	60	7.7	2,310.6	
5751	to	6000	59	1	59	7.7	2,318.2	
6001	to	6250	39	1	39	6.2	2,324.5	
6251	to	6500	23	1	23	4.8	2,329.3	
6501	to	6750	24	1	24	4.9	2,334.2	
6751	to	7000	17	1	17	4.1	2,338.3	
7001	to	7250	11	1	11	3.3	2,341.6	
7251	to	7500	7	1	7	2.6	2,344.3	
7501	to	7750	13	1	13	3.6	2,347.9	
7751	to	8000	13	1	13	3.6	2,351.5	
8001	to	8250	12	1	12	3.5	2,354.9	
8251	to	8500	10	1	10	3.2	2,358.1	
8501	to	8750	8	1	8	2.8	2,360.9	
8751	to	9000	8	1	8	2.8	2,363.8	
9001	to	9250	14	1	14	3.7	2,367.5	
9251	to	9500	5	1	5	2.2	2,369.7	
9501	to	9750	3	1	3	1.7	2,371.5	
9751	to	10000	2	1	2	1.4	2,372.9	
10001	to	12500	17	10	170	13.0	2,385.9	
12501	to	15000	5	10	50	7.1	2,393.0	
15001	to	20000	1	20	20	4.5	2,397.5	
20001	to	25000	2	20	40	6.3	2,403.8	
25001	to	30000	1	20	20	4.5	2,408.3	
30001	to	68644	1	154.576	154.576	12.4	2,420.7	52,280
Total N			456,310					456,310

BOUNDARIES INDICATED FOR STRATA:

	3	4	5	6
1	806.9	**605.2**	**484.1**	**403.4**
2	1,613.8	**1,210.3**	**968.3**	**806.9**
3		**1,815.5**	**1,452.4**	**1,210.3**

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Sample Design

OREGON RESIDENTIAL CLASS LOAD STUDY DESIGN OPTION (2008)
THREE STRATA, MEAN-PER-UNIT DESIGN

		a Sample Mean kW	b Sample Mean kWh	c 2008 Pop N	d Variance of Mean	e Standard Deviation	f Wtd. Devtns. c*e	g Proprtn. row f/ sum f	h Optimal Allocation g*h total	i Optimal with Attrition	j Final with Attrition
STRATUM 1	0 - 750 kWh	1.040	479.711	178,848	0.3254	0.570	102024	0.2670	11	11	20
STRATUM 2	751 - 1,750 kWh	2.445	1,149.480	225,182	0.7479	0.865	194743	0.5097	21	21	35
STRATUM 3	GT 1,750 kWh	4.741	2,321.920	52,280	2.6640	1.632	85331	0.2233	9	10	20
EST POP MEAN (wtd by N)		2.157	1,021.296	456,310			382098	1.0000	41	42	75

Sample Estimate	Adj Sample Estimate
41	75

RELATIVE PRECISION OF SAMPLE KW ESTIMATE

		TOTAL KW Optimal n (col. h)	TOTAL KW Adjusted n (col. i)	TOTAL KW Final (col. J	MEAN KW Adj. n
Variance contributed by strata:	1	1,040,821,283	1,040,821,283	547,773,107	0.004999
	2	1,896,071,312	1,896,071,312	1,115,266,717	0.009106
	3	910,010,183	808,882,465	383,081,549	0.003885
	4				
Total Variance		3,846,902,778	3,745,775,061	2,046,121,373	0.017990
Standard Error		62023.40509	61202.73736	45234.07314	0.134125348
Desired Conf. Level		90%	90%	90%	90%
(z two tailed)		1.645	1.645	1.645	1.645
Conf. Interval		102028.5014	100678.503	74410.05032	0.220636197
MPU Est of kW		984415.575	984415.575	984415.575	2.1573
Relative Conf. Int.		10.36%	10.23%	7.56%	10.23%

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Random Sample Selection

Oregon Residential Class Sample Parameters

Active Customers with kWh Meters
For the 12 Months Ending March 2008

Stratum	1	2	3	4	5
Sampling Frame	178,848	225,182	52,280		
Sample	20	35	20		
Interval	8,942.40	6,433.77	2,614.00		
Random Starts					
Primary					
Random No.[1]	0.73614	0.63858	0.01908		
Start	6583	4108	50		
Alternate 1					
Random No.[1]	0.32245	0.67499	0.55702		
Start	2884	4343	1456		
Alternate 2					
Random No.[1]	0.63755	0.55457	0.88375		
Start	5701	3568	2310		
Alternate 3					
Random No.[1]	0.06381	0.42825	0.10714		
Start	571	2755	280		
Alternate 4					
Random No.[1]	0.61245	0.44735	0.40029		
Start	5477	2878	1046		

[1] Random numbers from Excel's random function.

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Sampling Challenges

- Voltage level breakouts
- Requests for load estimates by demand breakouts on non-demand metered customers (OR 23).
- New tariffs (OR 28 & 30, WY 28)
- Samples are designed for a specific purpose, which makes their usefulness in other areas very limited

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Comparison of class load data to billing estimates

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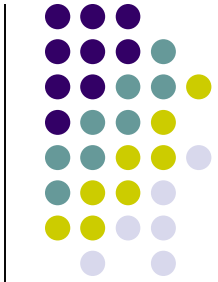
Load Research Processing Steps



1.)INCLUDE NEW SAMPLE IN LOAD RESEARCH MV90 SYSTEM

- -Ensure master files are correct
- -Build summary maps
- -Add contributors by strata
- -Input weight factors
- -Determine statistics to be stored
- -Input sample size, pop size, thresholds

2.)VERIFY EXISTING SAMPLES VS CSS

- -Rate change, disconnected, alternates

3.)ENTER SYSTEM PEAK DAY AND TIMES INTO MV90 SYSTEM

4.)DETERMINE 305 DATA BROKEN DOWN BY RATE AND STRATA

5.)CALCULATE USAGE DATA FOR ALL CONTRIBUTORS

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Load Research Processing Steps

6.)CALCULATE AVERAGE USAGE FOR CLASS AND STRATA

7.)INPUT MONTHLY POPULATIONS AND KWH BY CLASS AND STRATA

8.)TOTALIZE BY STRATA

9.)RUN REPORTS AND GRAPHS

- -Check for missing data, gaps, outliers
- -Modify summary map start/stop times
- -Delete data directory
- -Delete or Add to calculate usage data files (step 5)
- -Re-calculate average usage (step 6)
- -Re-totalize (step 8)
- -Run reports and graphs (step 9)

10.)VERIFY MV90 SAMPLE AVERAGES ARE COMPLETE

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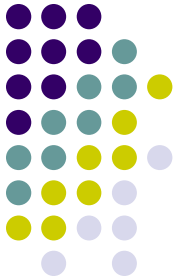
LOAD RESEARCH PROCESSING STEPS



11.)EXPORT MV90 SAMPLE AVERAGES INTO SAS FILES

12.)EXPAND MV90 SAMPLE AVERAGES BY POPULATION

13.)BUILD STREET LIGHTING AND OFF SEASON IRRIGATION SCHEDULES

14.)ADJUST LOAD RESEARCH KWH TO PRICING KWH

15.)DETERMING DISTRIBUTION PEAK DAY AND TIMES

16.)EXTRACT VARIOUS REPORT DATA

- -System peaks
- -Distribution peaks
- -Schedule peaks
- -Class peaks
- -etc.

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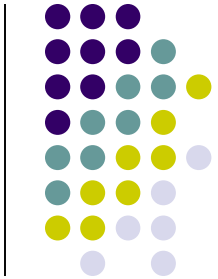
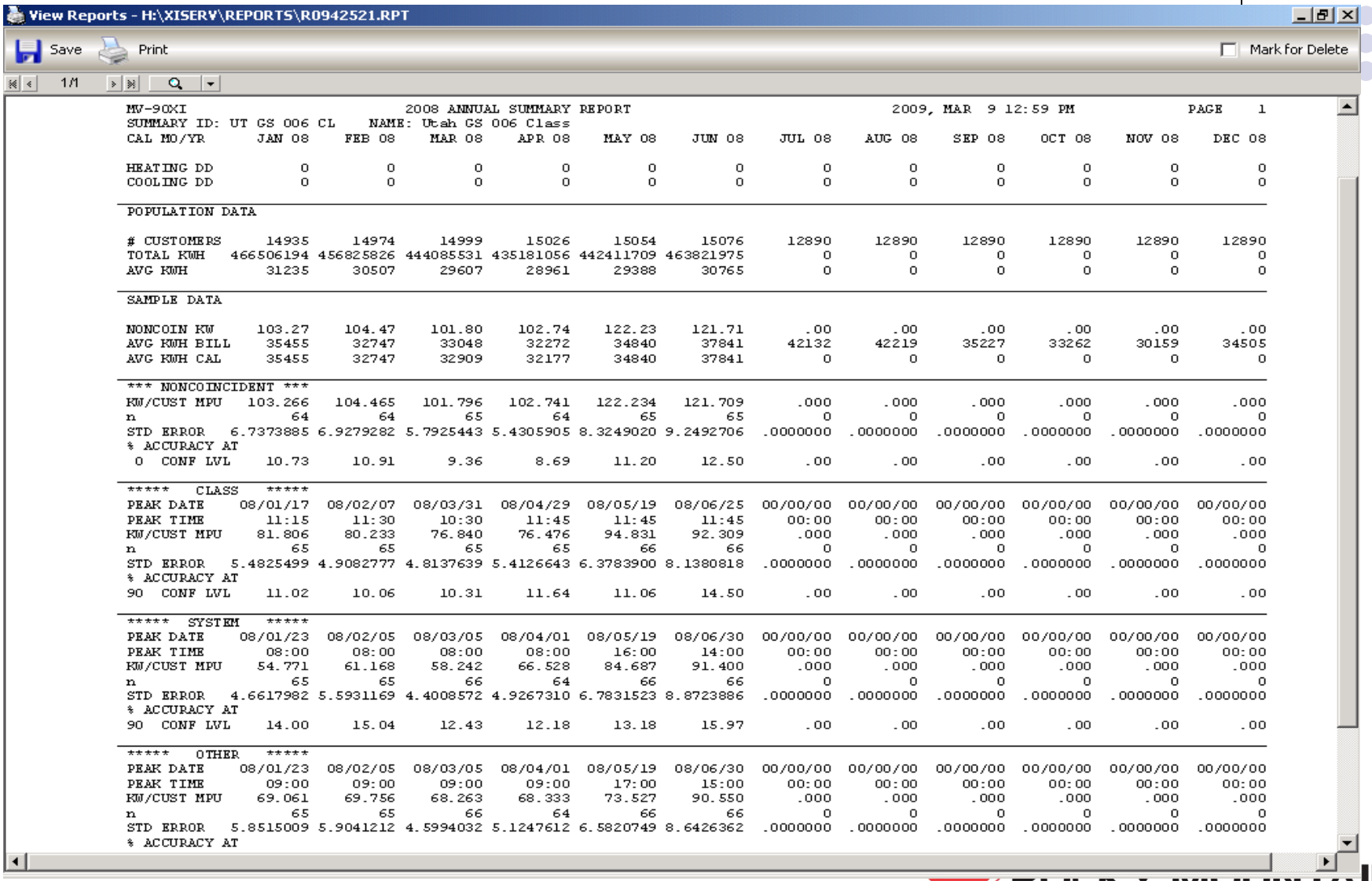
Preparation of Class loads to be used in Rate Filing



	Department	Test Year	+1 Month	+2 Months	+3 Months	+4 Months
Test year data collection ends		12 months				
Load Profile reads retrieved	Load Research		30 days			
Special request load profile reads	Load Research			15 days		
Class load profiles completed	Load Research				15 days	
Prep of historic energy & peaks	Pricing		60 days			
Forecast energy & peaks completed	Forecast			Ongoing		
Forecast challenge	Pricing				15 days	
Rate sched forecast energy complete	Pricing					15 days
Forecast class loads completed	Load Research					7 days

Annual Summary Report



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MV-90XI 2008 ANNUAL SUMMARY REPORT 2009, MAR 9 12:59 PM PAGE 1
SUMMARY ID: UT GS 006 CL NAME: Utah GS 006 Class

CAL MO/YR	JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEP 08	OCT 08	NOV 08	DEC 08
HEATING DD	0	0	0	0	0	0	0	0	0	0	0	0
COOLING DD	0	0	0	0	0	0	0	0	0	0	0	0
POPULATION DATA												
# CUSTOMERS	14935	14974	14999	15026	15054	15076	12890	12890	12890	12890	12890	12890
TOTAL KWH	466506194	456825826	444085531	435181056	442411709	463821975	0	0	0	0	0	0
AVG KWH	31235	30507	29607	28961	29388	30765	0	0	0	0	0	0
SAMPLE DATA												
NONCOIN KW	103.27	104.47	101.80	102.74	122.23	121.71	.00	.00	.00	.00	.00	.00
AVG KWH BILL	35455	32747	33048	32272	34840	37841	42132	42219	35227	33262	30159	34505
AVG KWH CAL	35455	32747	32909	32177	34840	37841	0	0	0	0	0	0
*** NONCOINCIDENT ***												
KW/CUST MPU	103.266	104.465	101.796	102.741	122.234	121.709	.000	.000	.000	.000	.000	.000
n	64	64	65	64	65	65	0	0	0	0	0	0
STD ERROR	6.7373885	6.9279282	5.7925443	5.4305905	8.3249020	9.2492706	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
% ACCURACY AT												
0 CONF LVL	10.73	10.91	9.36	8.69	11.20	12.50	.00	.00	.00	.00	.00	.00
***** CLASS *****												
PEAK DATE	08/01/17	08/02/07	08/03/31	08/04/29	08/05/19	08/06/25	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00
PEAK TIME	11:15	11:30	10:30	11:45	11:45	11:45	00:00	00:00	00:00	00:00	00:00	00:00
KW/CUST MPU	81.806	80.233	76.840	76.476	94.831	92.309	.000	.000	.000	.000	.000	.000
n	65	65	65	65	66	66	0	0	0	0	0	0
STD ERROR	5.4825499	4.9082777	4.8137639	5.4126643	6.3783900	8.1380818	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
% ACCURACY AT												
90 CONF LVL	11.02	10.06	10.31	11.64	11.06	14.50	.00	.00	.00	.00	.00	.00
***** SYSTEM *****												
PEAK DATE	08/01/23	08/02/05	08/03/05	08/04/01	08/05/19	08/06/30	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00
PEAK TIME	08:00	08:00	08:00	08:00	16:00	14:00	00:00	00:00	00:00	00:00	00:00	00:00
KW/CUST MPU	54.771	61.168	58.242	66.528	84.687	91.400	.000	.000	.000	.000	.000	.000
n	65	65	66	64	66	66	0	0	0	0	0	0
STD ERROR	4.6617982	5.5931169	4.4008572	4.9267310	6.7831523	8.8723886	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
% ACCURACY AT												
90 CONF LVL	14.00	15.04	12.43	12.18	13.18	15.97	.00	.00	.00	.00	.00	.00
***** OTHER *****												
PEAK DATE	08/01/23	08/02/05	08/03/05	08/04/01	08/05/19	08/06/30	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00	00/00/00
PEAK TIME	09:00	09:00	09:00	09:00	17:00	15:00	00:00	00:00	00:00	00:00	00:00	00:00
KW/CUST MPU	69.061	69.756	68.263	68.333	73.527	90.550	.000	.000	.000	.000	.000	.000
n	65	65	66	64	66	66	0	0	0	0	0	0
STD ERROR	5.8515009	5.9041212	4.5994032	5.1247612	6.5820749	8.6426362	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
% ACCURACY AT												

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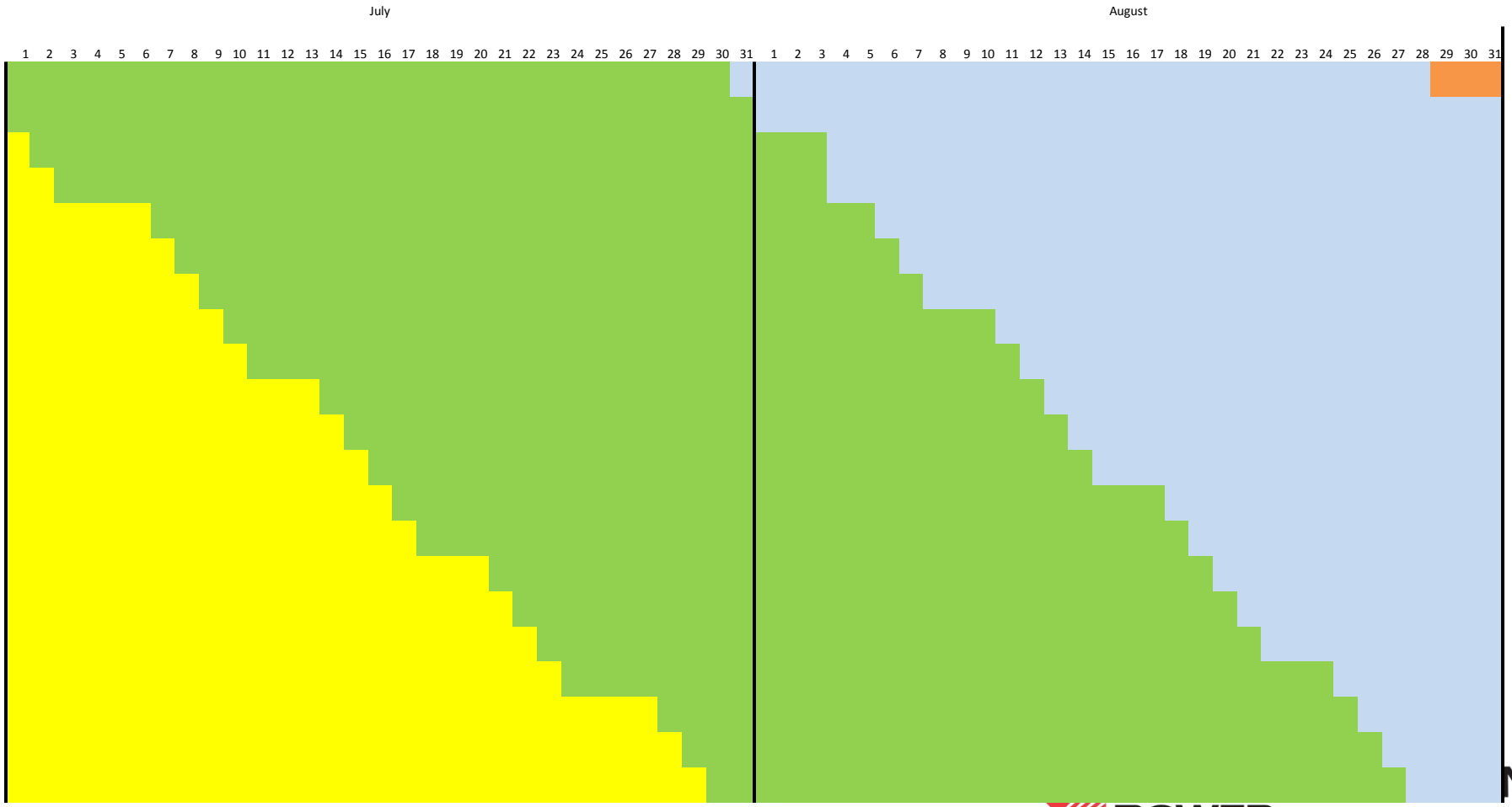
Cycle Days



POWER
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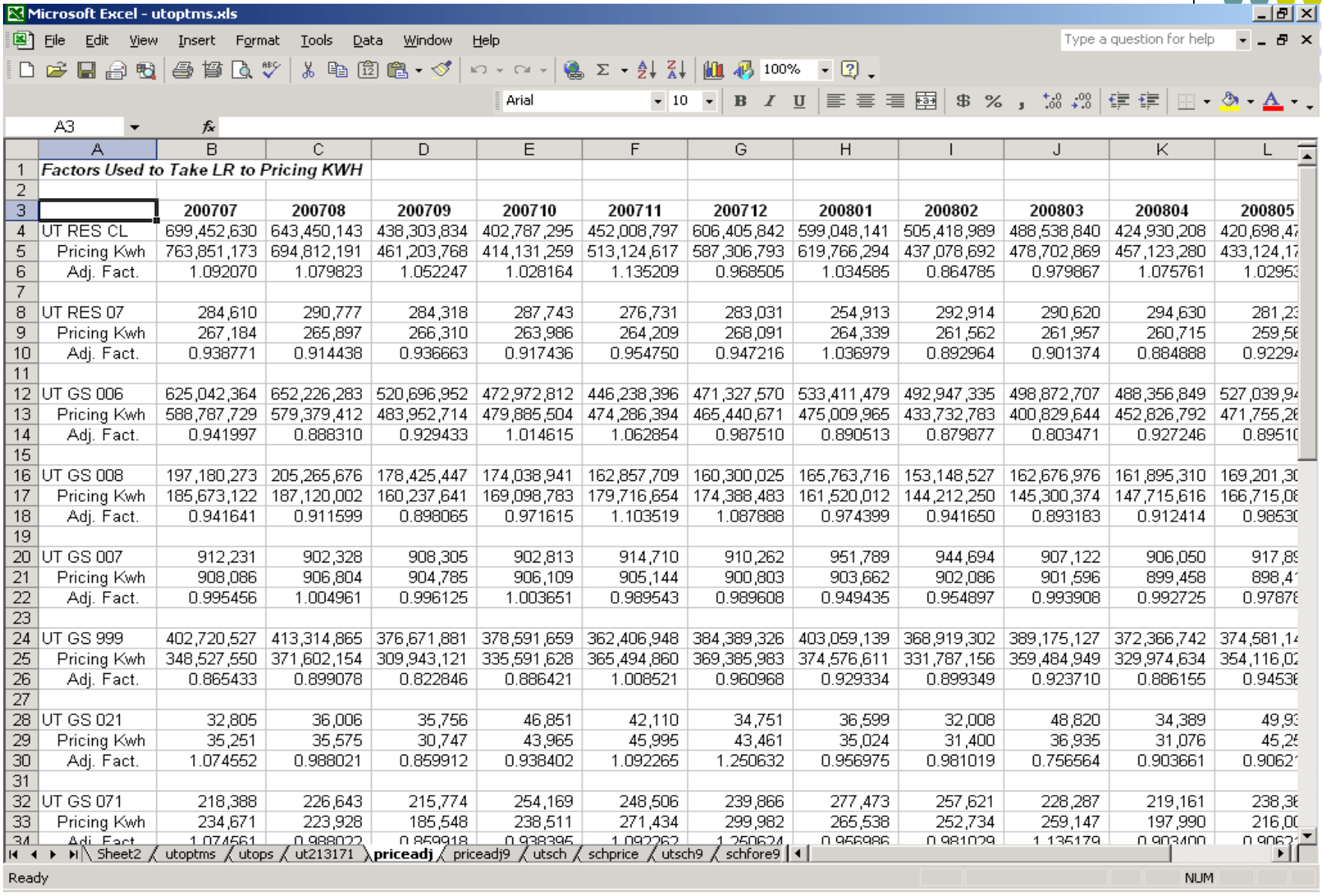
Adjust to Pricing Kwh


Microsoft Excel - utoptms.xls

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Type a question for help

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Arial 10

A3

	A	B	C	D	E	F	G	H	I	J	K	L
1	*Factors Used to Take LR to Pricing KWH*											
2												
3		**200707**	**200708**	**200709**	**200710**	**200711**	**200712**	**200801**	**200802**	**200803**	**200804**	**200805**
4	UT RES CL	699,452,630	643,450,143	438,303,834	402,787,295	452,008,797	606,405,842	599,048,141	505,418,989	488,538,840	424,930,208	420,698,47
5	Pricing Kwh	763,851,173	694,812,191	461,203,768	414,131,259	513,124,617	587,306,793	619,766,294	437,078,692	478,702,869	457,123,280	433,124,17
6	Adj. Fact.	1.092070	1.079823	1.052247	1.028164	1.135209	0.968505	1.034585	0.864785	0.979867	1.075761	1.02953
7												
8	UT RES 07	284,610	290,777	284,318	287,743	276,731	283,031	254,913	292,914	290,620	294,630	281,23
9	Pricing Kwh	267,184	265,897	266,310	263,986	264,209	268,091	264,339	261,562	261,957	260,715	259,58
10	Adj. Fact.	0.938771	0.914438	0.936663	0.917436	0.954750	0.947216	1.036979	0.892964	0.901374	0.884888	0.92294
11												
12	UT GS 006	625,042,364	652,226,283	520,696,952	472,972,812	446,238,396	471,327,570	533,411,479	492,947,335	498,872,707	488,356,849	527,039,94
13	Pricing Kwh	588,787,729	579,379,412	483,952,714	479,885,504	474,286,394	465,440,671	475,009,965	433,732,783	400,829,644	452,826,792	471,755,26
14	Adj. Fact.	0.941997	0.888310	0.929433	1.014615	1.062854	0.987510	0.890513	0.879877	0.803471	0.927246	0.89510
15												
16	UT GS 008	197,180,273	205,265,676	178,425,447	174,038,941	162,857,709	160,300,025	165,763,716	153,148,527	162,676,976	161,895,310	169,201,30
17	Pricing Kwh	185,673,122	187,120,002	160,237,641	169,098,783	179,716,654	174,388,483	161,520,012	144,212,250	145,300,374	147,715,616	166,715,08
18	Adj. Fact.	0.941641	0.911599	0.898065	0.971615	1.103519	1.087888	0.974399	0.941650	0.893183	0.912414	0.98530
19												
20	UT GS 007	912,231	902,328	908,305	902,813	914,710	910,262	951,789	944,694	907,122	906,050	917,89
21	Pricing Kwh	908,086	906,804	904,785	906,109	905,144	900,803	903,662	902,086	901,596	899,458	898,41
22	Adj. Fact.	0.995456	1.004961	0.996125	1.003651	0.989543	0.989608	0.949435	0.954897	0.993908	0.992725	0.97878
23												
24	UT GS 999	402,720,527	413,314,865	376,671,881	378,591,659	362,406,948	384,389,326	403,059,139	368,919,302	389,175,127	372,366,742	374,581,14
25	Pricing Kwh	348,527,550	371,602,154	309,943,121	335,591,628	365,494,860	369,385,983	374,576,611	331,787,156	359,484,949	329,974,634	354,116,02
26	Adj. Fact.	0.865433	0.899078	0.822846	0.886421	1.008521	0.960968	0.929334	0.899349	0.923710	0.886155	0.94536
27												
28	UT GS 021	32,805	36,006	35,756	46,851	42,110	34,751	36,599	32,008	48,820	34,389	49,93
29	Pricing Kwh	35,251	35,575	30,747	43,965	45,995	43,461	35,024	31,400	36,935	31,076	45,25
30	Adj. Fact.	1.074552	0.988021	0.859912	0.938402	1.092265	1.250632	0.956975	0.981019	0.756564	0.903661	0.90621
31												
32	UT GS 071	218,388	226,643	215,774	254,169	248,506	239,866	277,473	257,621	228,287	219,161	238,38
33	Pricing Kwh	234,671	223,928	185,548	238,511	271,434	299,982	265,538	252,734	259,147	197,990	216,00
34	Adj. Fact.	1.074561	0.988022	0.859918	0.938395	1.092262	1.250624	0.956986	0.981029	1.135179	0.903400	0.90621

Sheet2 | utoptms | utops | ut213171 | priceadj | priceadj9 | utsch | schprice | utsch9 | schfore9

Ready NUM

What do we do with irrigation?

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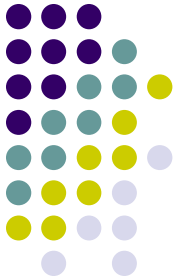
Issues Associated with Irrigation Samples



- In 2008, there were 2,695 irrigation customers listed as active in the Company's billing system. Of that amount:

  - ✓ 240 had 0 usage for the season
  - ✓149 had less that 250 kWh of usage during the season
  - ✓ 14% of total active customers had 0 or very low usage for the season

- In 2009, there were 2,745 irrigation customers listed as active in the Company's billing system. Of that amount:

  - ✓ 230 had 0 usage for the season
  - ✓160 had less that 250 kWh of usage during the season
  - ✓ 14% of total active customers had 0 or very low usage for the season

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Issues Associated with Irrigation Samples

- Typically a high variance group
- There really is no standard irrigation load shape

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Issues Associated with Irrigation Samples

Recommended solution:

- Structure the sample design and customer selection process such that you have a high probability of selecting customers who are actively irrigating. The purpose of this design philosophy is to construct a load curve which reflects actual active irrigation.
  - Utilization of this philosophy will **always** provide estimates that **exceed** billed usage
- Implementation of this philosophy requires that the load curves provided be adjusted **downward** to reflect billed energy for the class

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Forecasting class loads

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Peak Date Alignment

System Peak Day Comparison					
Base Year - 2008		Base Year Aligned to Test Year		Test Year - 2009/10	
Jan 24, 2008 @ 09:00	Thu	Jan 28, 2010 @ 09:00	Thu	Jan 22, 2010 @ 09:00	Fri
Feb 05, 2008 @ 09:00	Tue	Feb 09, 2010 @ 09:00	Tue	Feb 04, 2010 @ 09:00	Thu
Mar 05, 2008 @ 09:00	Wed	Mar 10, 2010 @ 09:00	Wed	Mar 30, 2010 @ 09:00	Tue
Apr 01, 2008 @ 09:00	Tue	Apr 06, 2010 @ 09:00	Tue	Apr 01, 2010 @ 09:00	Thu
May 19, 2008 @ 17:00	Mon	May 24, 2010 @ 17:00	Mon	May 19, 2010 @ 16:00	Wed
Jun 30, 2008 @ 15:00	Mon			Jun 24, 2010 @ 16:00	Thu
Jul 09, 2008 @ 18:00	Wed	Jul 08, 2009 @ 18:00	Wed	Jul 20, 2009 @ 17:00	Mon
Aug 14, 2008 @ 18:00	Thu	Aug 13, 2009 @ 18:00	Thu	Aug 27, 2009 @ 17:00	Thu
Sep 08, 2008 @ 17:00	Mon	Sep 07, 2009 @ 17:00	Mon	Sep 10, 2009 @ 17:00	Thu
Oct 01, 2008 @ 17:00	Wed	Sep 30, 2009 @ 17:00	Wed	Oct 30, 2009 @ 09:00	Fri
Nov 05, 2008 @ 19:00	Wed	Nov 05, 2009 @ 19:00	Thu	Nov 25, 2009 @ 19:00	Wed
Dec 15, 2008 @ 19:00	Mon	Dec 14, 2009 @ 19:00	Mon	Dec 16, 2009 @ 19:00	Wed

Weather normalization of class loads

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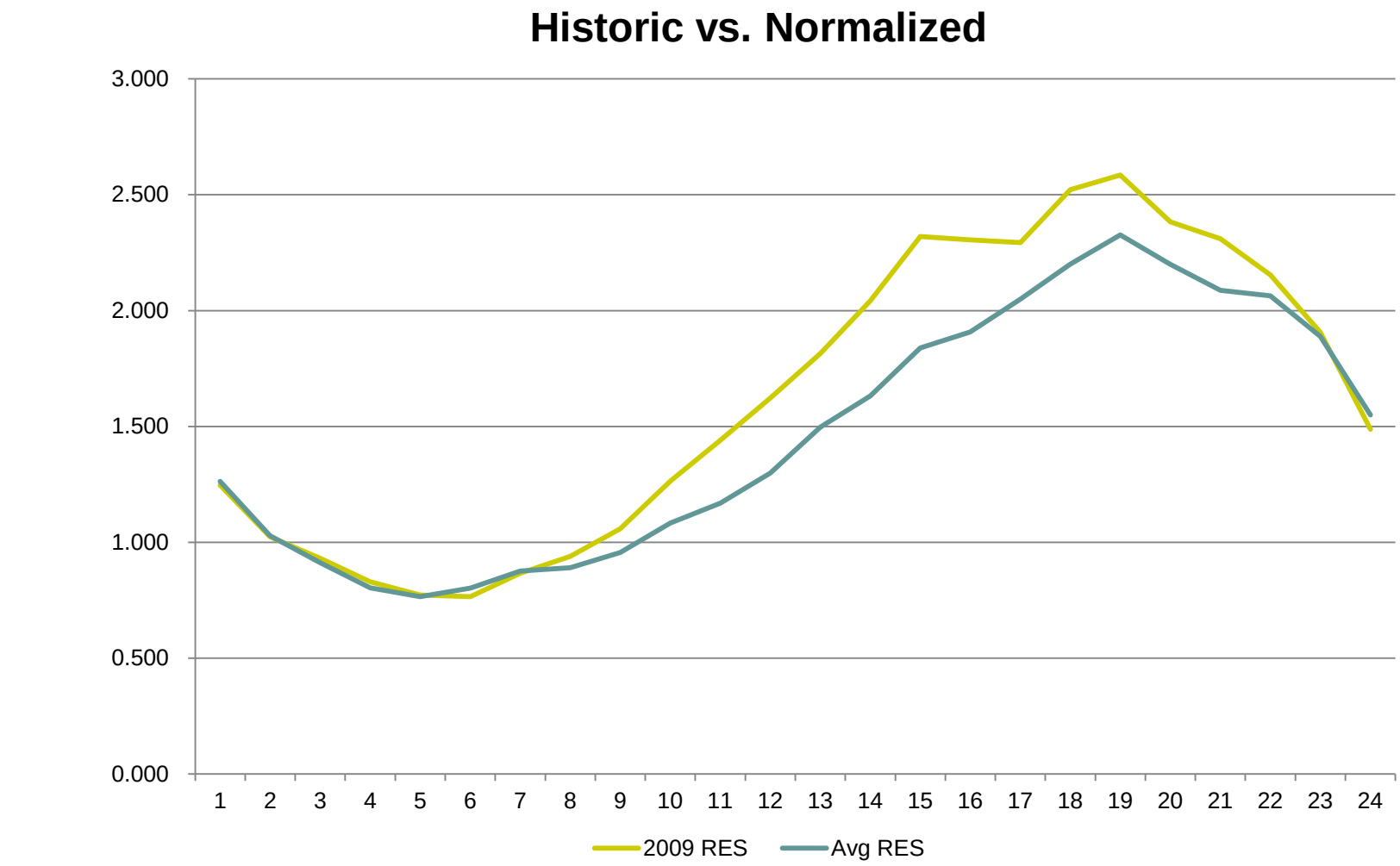

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The calibration conundrum

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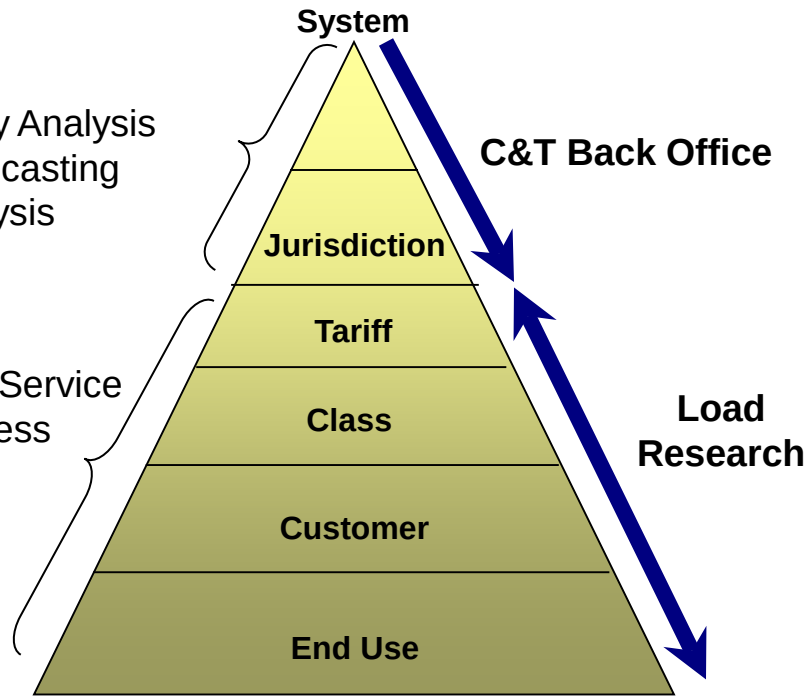
Regulatory Support

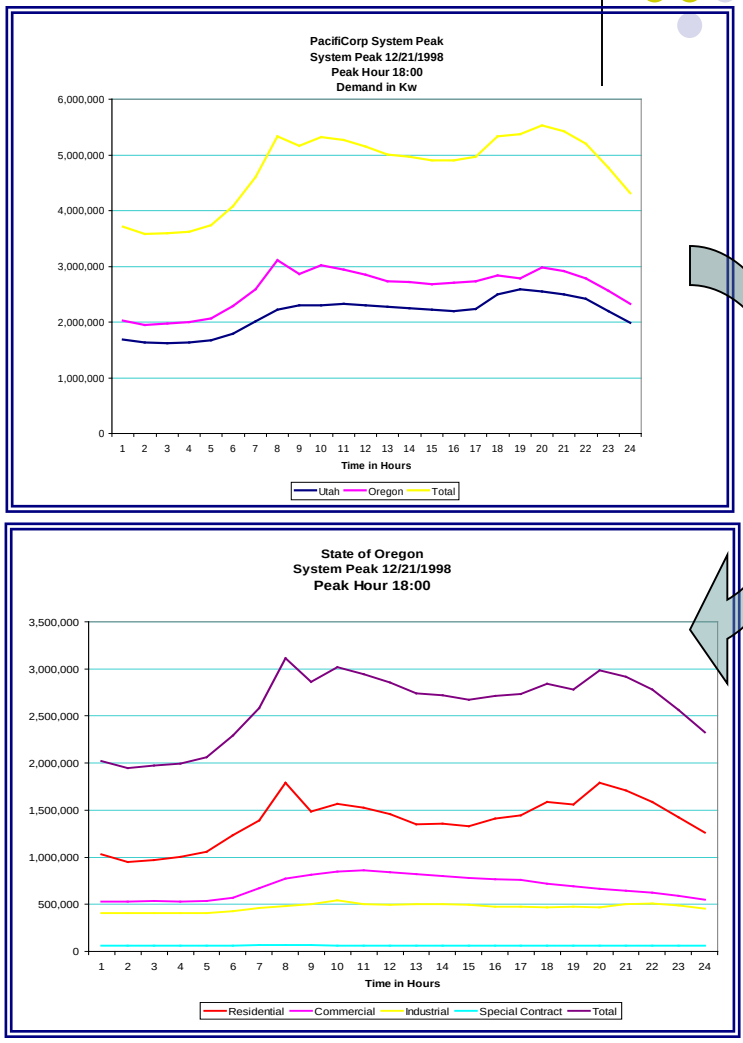
Regulatory Analysis
Peak Forecasting
Loss Analysis

Customer Service
Retail Access
Billing
EPO



C&T Back Office

Load Research



The calibration philosophy rests upon a faulty assumption:

Any difference between class loads and jurisdictional loads is entirely attributable to sampling error in the sampled classes.

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Calibration Issues

- Jurisdictional loads and class loads are not homogeneous
- Loss Factors
- Real world vs. the theoretical

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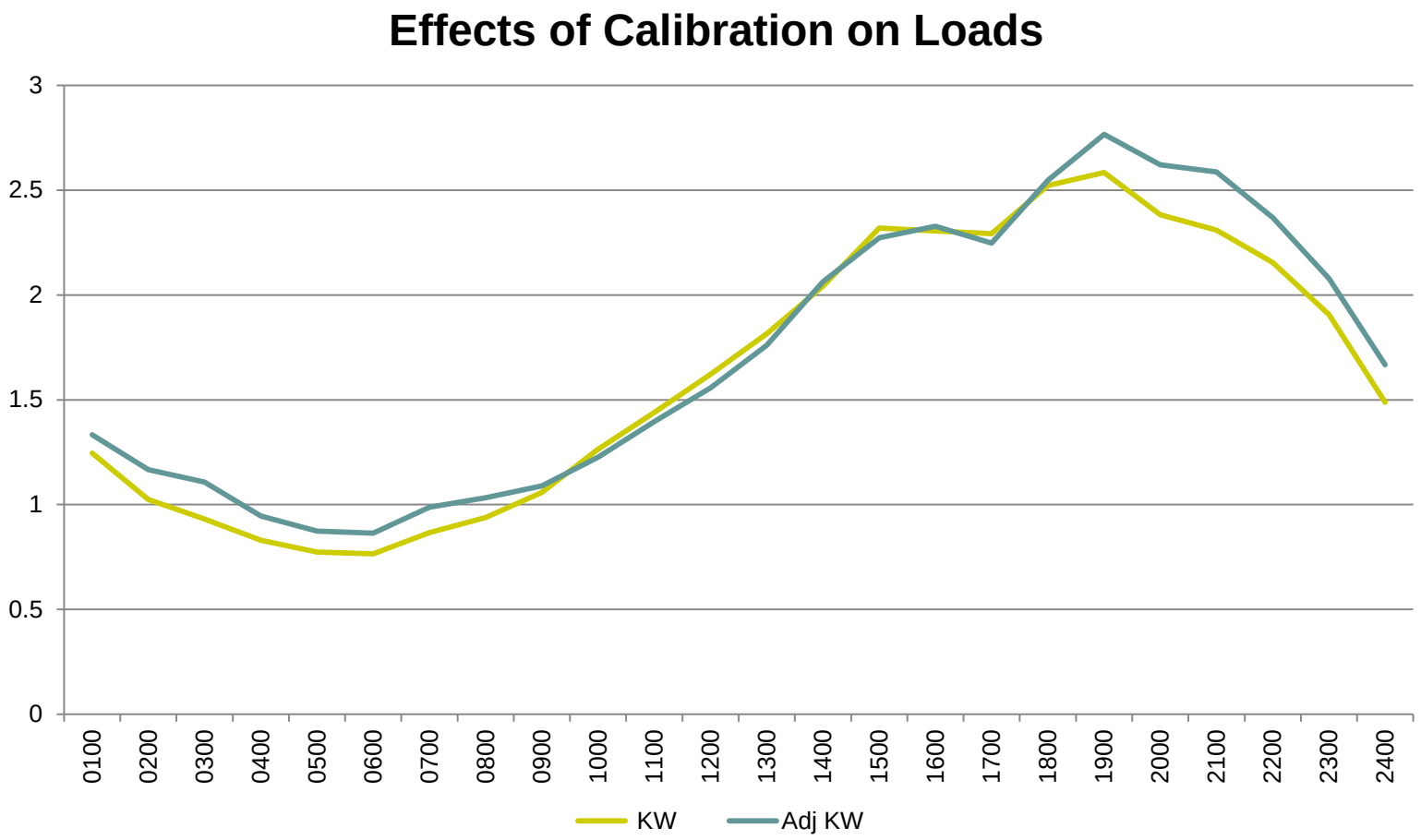

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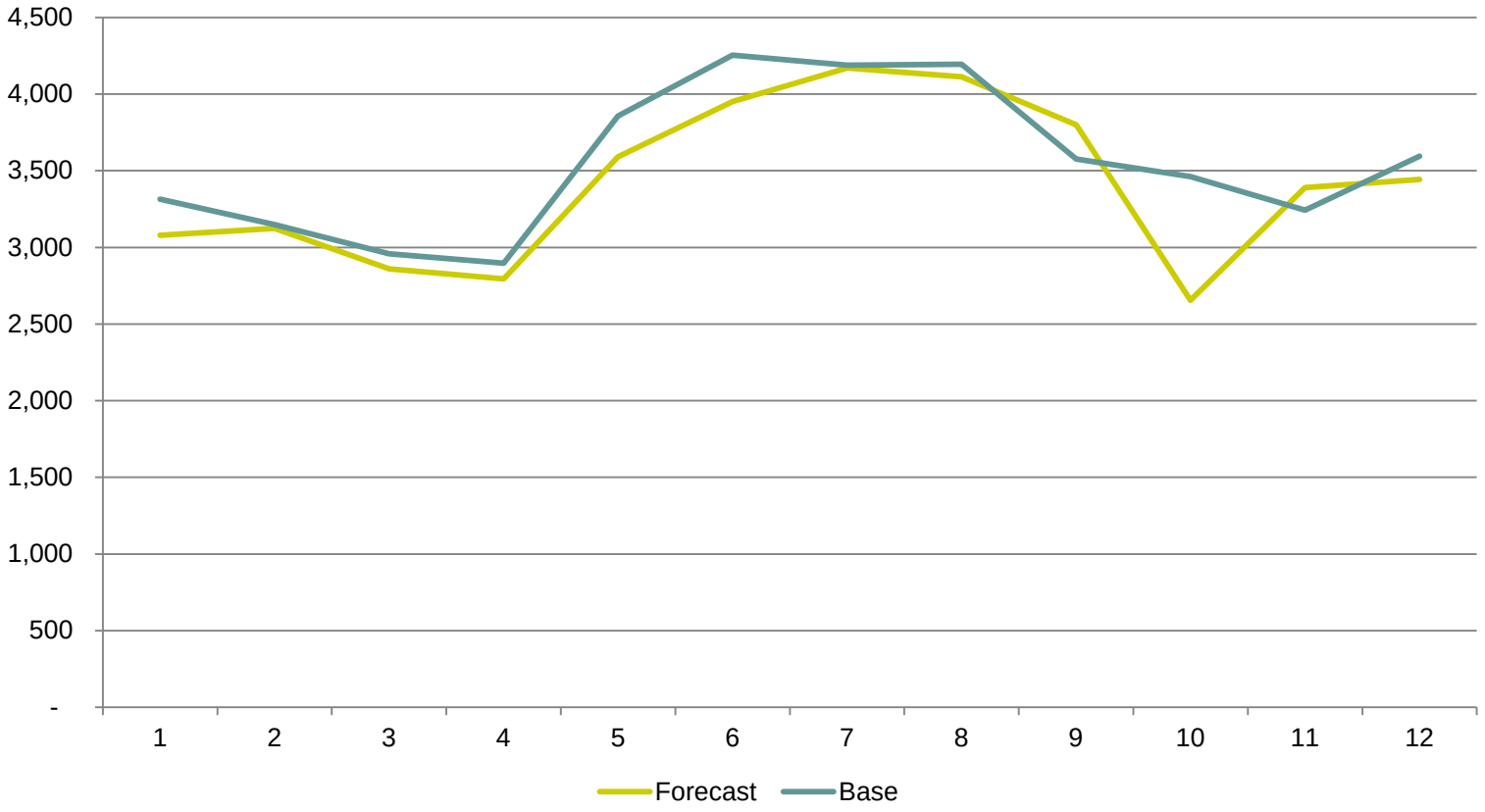
Comparison of Base vs. Forecast Jurisdictional Loads



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Questions?

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