

Load Research Status

January 15, 2002



What is Load Research?

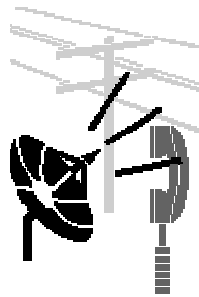
“An activity embracing the measurement and study of the characteristics of electric loads to provide a thorough and reliable knowledge of trends, and the general behavior of the load characteristics of the more important electrical services rendered by the electrical utility industry”

Source: AEIC Load Research Manual 2000 Edition

Data Acquisition



Optic Probe (manual)	1085
Dedicated Telephone	125
Cellular Telephone	925
Packet Radio	8
Total	2143



Load Research Study
 Large Customer Billing
 Energy Profiler Online
 Remote Meter Reading

Oregon SB1149
 Special Studies
 2002 Olympics



Sampling Methodology

- Mean Per Unit
- Stratified (kWh, kW, hp, LF, Weather Zone)
- Sampling Variable (kWh, kW, hp)
- Random Sample Selection
- Dalenius-Hodges Minimum variance stratification
- Neyman Allocation Optimal allocation of sample points to strata
- 90% +/- 10% Precision 1978 PURPA & Industry Standard

Sample Rotation

	<u>Estimation Method</u>	<u>Design Vintage</u>	<u>Cycle</u>
Utah			
•Residential	MPU kWh	2000	Ongoing
•C&I Rate 023	MPU kWh	1991	Ongoing
•C&I Rate 006 (< 1MW)	MPU kWh	1991	Ongoing
•C&I Rate 009 (< 1MW)	MPU kW	1991	Ongoing
•C&I > 1MW	Census		Ongoing
•Irrigation	MPU kW	1992	Historical
•Streetlights	Burning Hour Calculation		
Oregon			
•Residential	MPU kWh	1995	Ongoing
•C&I Small-Medium	MPU kWh	1994	Ongoing
•C&I > 1MW	Census		Ongoing
•SB1149 (> 200 kW)	Census		Ongoing
•SB1149 Res. TOU	MPU kWh/Zone		

Sample Rotation

	<u>Estimation Method</u>	<u>Design Vintage</u>	<u>Cycle</u>
Idaho			
•Residential 001	MPU kWh	2000	5-Year
•Residential 036	MPU kWh	2000	5-Year
•C&I < 1MW	Historical	1996	5-Year
•C&U 008 & 009	Census		Ongoing
•C&I > 1MW	Census		Ongoing
•Irrigation	MPU kW	1999	Ongoing
•Streetlights	Burning Hour Calculation		
Washington			
•Residential	Historical	1998	5-Year
•C&I Small-Medium	Historical	1995	5-Year
•C&I > 1MW	Census		Ongoing

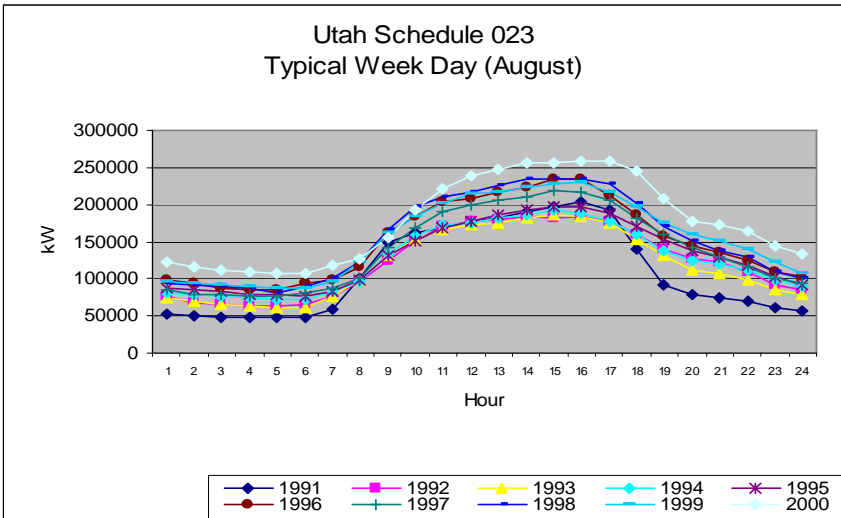
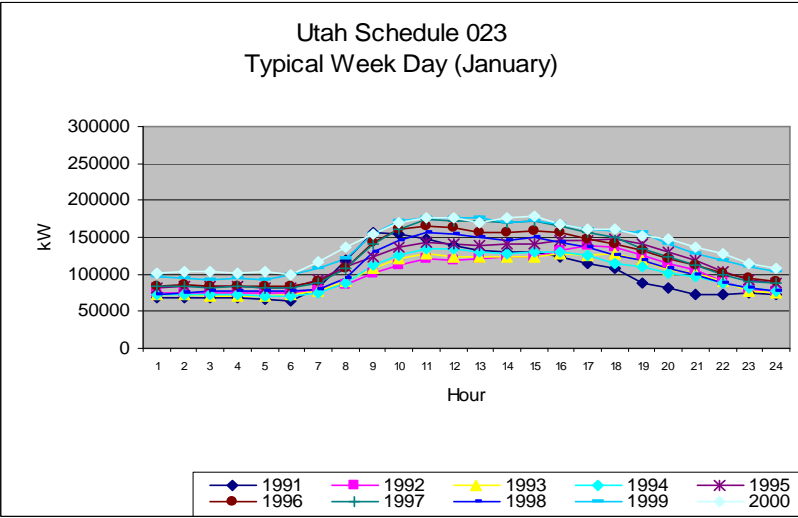
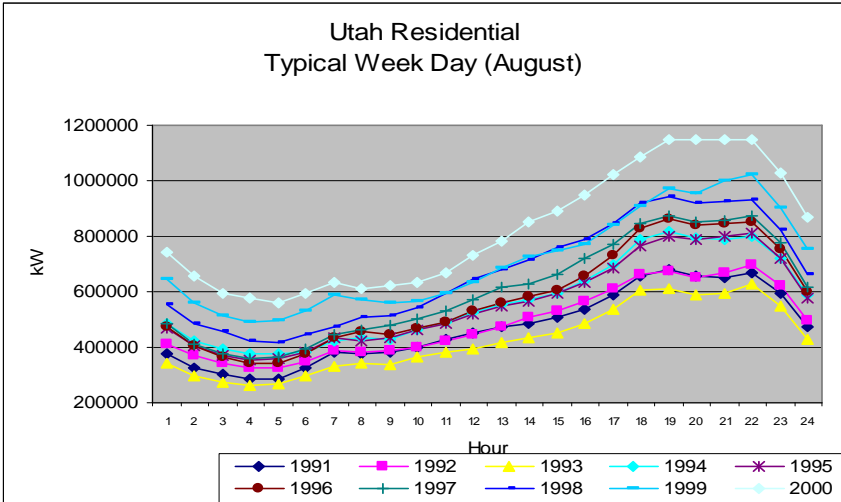
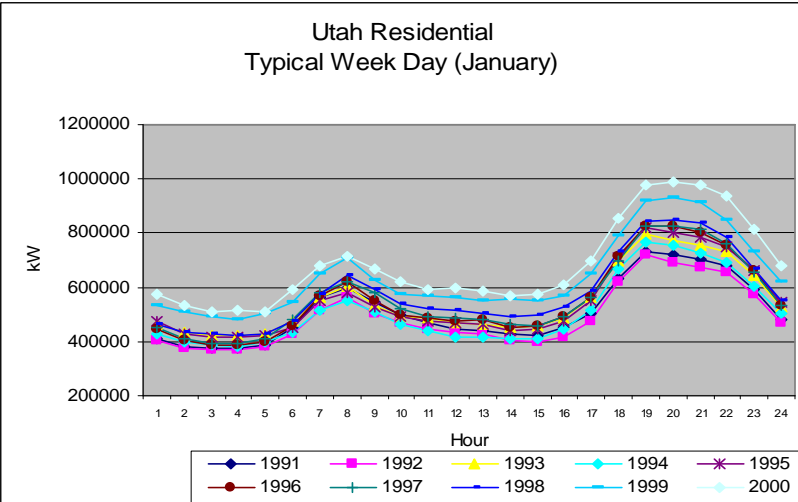
Sample Rotation

	<u>Estimation Method</u>	<u>Design Vintage</u>	<u>Cycle</u>
Wyoming West			
•Residential 001	Historical	1998	5-Year
•C&I < 1MW	Historical	1994	5-Year
•C&I > 1MW	Census		Ongoing
•Irrigation	Based on Idaho 039		
•Streetlights	Burning Hour Calculation		
Wyoming East			
•Residential	Historical	1998	5-Year
•C&I Small-Medium	Historical	1994	5-Year
•C&I > 1MW	Census		Ongoing
California			
•Residential	Based on Oregon		
•C&I < 1MW	Based on Oregon		
•C&I > 1MW	Census		Ongoing

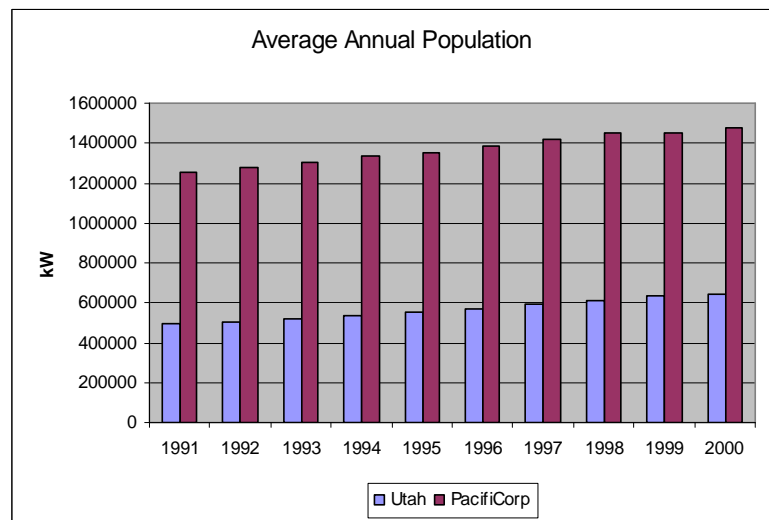
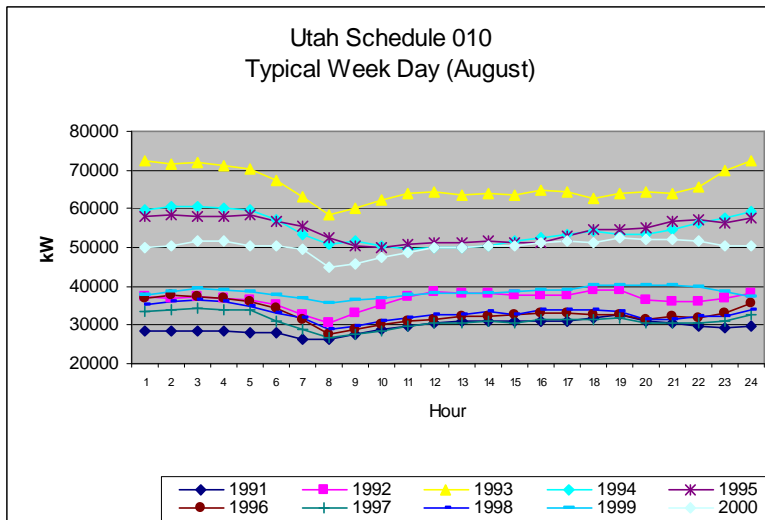
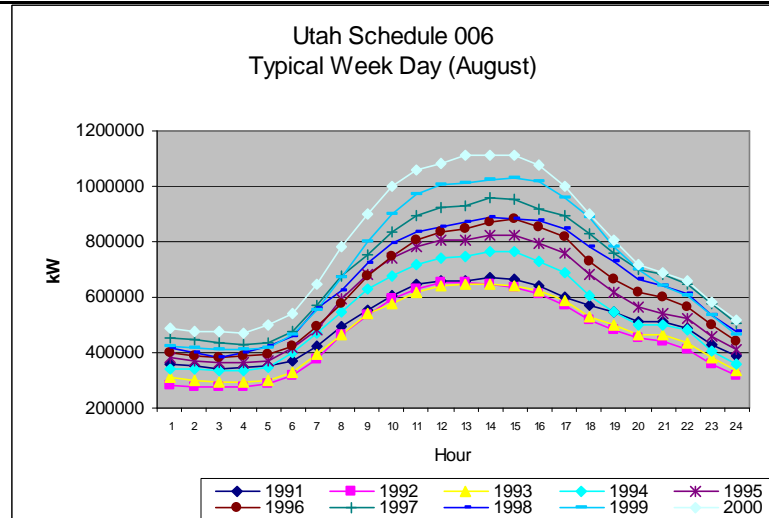
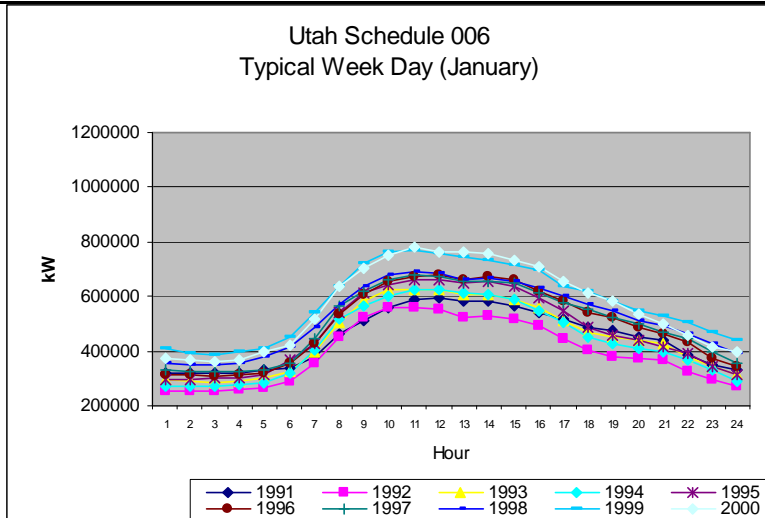
Utah Sample Stratification

	Stratum Range			Weight Factor	Sample Points	Design Precision
	Stratum	Start	End			
Residential Class (Ave Monthly kWh)	1	-	500	0.43926	74	90+/-10%
	2	501	1,000	0.40954	60	
	3	1,001	2,083	0.13839	20	
	4	2,084	999,999	0.01282	15	
C&I Rate 023 (Ave Monthly kWh)	1	-	1,250	0.66570	24	90+/-10%
	2	1,251	4,167	0.25143	20	
	3	4,168	999,999	0.08287	19	
C&I Rate 006 (Ave Monthly kWh)	1	-	25,000	0.75319	29	90+/-10%
	2	25,001	66,667	0.15475	22	
	3	66,668	166,667	0.06506	11	
	4	166,668	999,999	0.02700	19	
C&I Rate 009 (Ave Monthly kW)	1	-	400	0.47541	10	90+/-10%
	2	401	999	0.52459	10	
Irrigation Class (Ave Monthly kWh)	1	-	25	0.53832	10	90+/-15%
	2	26	70	0.26582	12	
	3	71	150	0.15207	15	
	4	151	999,999	0.04380	14	

Historical Comparisons



Historical Comparisons - Continued



Historical Comparisons - Continued

