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Macalester College Annual Energy Summary 1996-97

Macalester College

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MACALESTER COLLEGE

1996-97

ANNUAL ENERGY SUMMARY

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INTRODUCTION: The information contained in this booklet summarizes energy consumption for Macalester College steam plant and main electrical loop from June 1, 1996 through May 31, 1997. This booklet does not cover the cost of small individual gas and electric meters serving buildings not served by the central plant or main electric loop. Unless otherwise noted energy consumption figures and costs are based on actual billings from energy suppliers (Koch Refining, NSP Electric, NSP Gas). Throughout this summary the word "fuel" may denote either #2 or #6 fuel oils or natural gas.

YEAR IN REVIEW

At 140,880 billion btus total (electricity, fuel oil and gas) consumption exceeded any previous reading in the past twelve years by 6.6 billion btus. Total energy costs exceeded the budget by \$92,126 for a total cost of \$852,326; an amount exceeding any previous year of the past twelve by \$87,230. These increases in cost and consumption were incurred even though heating degrees decreased 624 days in 1996-97 as compared to the previous year.

Two factors contributed to these marked increases; first the Rice portion of the renovated Olin/Rice Science complex became fully operational, and second, even though publicly regulated electrical rates remain relatively cheap gas and fuel oil rates are experiencing extreme volatility. Fuel prices pushed average fuel costs to the highest level in the past ten years.

FUEL CONSUMPTION during 1996-97 totaled 99,991 billion btus. This compares to other highs of 100,514 in 1984-85 and 100,426 in 1988-89. At 7,297 1996-97 heating degree days fell below last year's reading of 7,921 but consumption increased during this period by 8.4 billion btus. This consumption is directly related to adding Rice Hall and temporary heat consumption for the new residence hall.

A comparison of the "old" Rice Hall in 1992-93 (heating degree days of 7,296) versus the "new" Rice Hall of 1996-97 (heating degree days of 7,297) shows an increase from 249,140 to 1,705,500 gallons of condensate respectively or a 585% increase. Additionally, even though the new residence hall metering did not start until January, 1997 temporary heat requirements totaled 240,700 gallons.

In addition to higher consumption levels natural gas and fuel prices both experienced significant increases during the early winter months of 1996-97. In December, 1996 gas and #6 fuel oil prices totaled \$4.40 and \$3.20 per million btus respectively. These levels exceeded any previous levels of the past ten years. January saw a decrease in gas prices to \$3.93 per million btus but #6

fuel oil increased to .60 per gallon or \$4.00 per million btus. Even though natural gas prices decreased substantially during February the majority of costs were already incurred for the year. These higher prices pushed average fuel costs up to \$3.08 per million btus as compared to \$2.31 per million btus the year before or increase of 33.33%.

ELECTRICITY: While electricity prices remained stable (actually dropping in cost per unit by \$.002) consumption increased from 10,836,825 kwh in 1995-96 to 11,983,679 kwh in 1996-1997 or 10.6%. This increase can be directly attributed to the operation of Rice Hall where the electrical consumption went from 603,426 kwh in 1992-93 to 2,009,643 kwh in 1996-97 or an increase of 233%. Normal campus operations have ventilation fans shut down when buildings closed but with fume hoods, chemicals, and 24 hour experiments Rice fails to close and is not designed to do so. This means major ventilation fans (100hp, 125hp, 40hp, 5-30hp) run continuously racking up additional consumption and demand charges every minute of each day. Additionally, during air conditioning periods this requires the central chilled water plant to operate 24 hours a day when previously it was only operated 12 hours a day. Central plant chiller operating hours increased from 1,644 to 2,185 hours or 32.1% between 1995-96 and 1996-97. An extremely cold spring in 1997 kept this number from increasing even more; anticipate increased operating hours during 1997-98.

SUMMARY: Fiscal year 1996-97 represents the first year of a new era for Macalester College. Olin/Rice pushed Macalester from a day operation for academic buildings and heat only to residence halls to an around the clock operation for both heating and cooling. The addition of the new residence hall and the renovation of 30 Mac will add to this around the clock operation. Once completed the new Campus Center will again cause a significant increase in utility costs when it becomes operational.

The wild card in budgeting for upcoming years will be the volatility in the energy markets. Macalester should anticipate relatively stable electrical fees for the next 4 or 5 years unless a major energy crisis occurs. Once retail wheeling occurs electrical rates may decrease but more likely will experience an increase. Available information suggests fuel oil and natural gas prices will remain volatile for the next year and may remain so even if supplies remain stable.

Campus energy consumption continues to increase but energy saving equipment and designs provide a significant savings in both current operations and when compared to historical consumption levels. Since 1972 the campus has added approximately 200,000 square feet and significant equipment loads (printers, computers, microwaves, additional air conditioning and heating) and yet our consumption during 1996-97 still fell 33 billion btus below 1971-1972.

1996-97 FUEL & ELECTRICITY CONSUMPTION

		JUN	JUL	AUG	SEP
GAS	QUANTITY-CCF	0	0	0	0
	COST-\$	\$288.75	\$288.75	\$288.75	\$288.75
	UNIT COST	0	0	0	0
	CCF BTUS(X1000)	0	0	0	0
#2 FUEL OIL	QUANTITY-GAL	0	0	0	0
	COST-\$	\$0.00	\$0.00	\$0.00	\$0.00
	UNIT COST	0.0000	0.0000	0.0000	0.0000
#6 FUEL OIL	QUANTITY-GAL	0	0	0	0
	COST-\$	\$0.00	\$0.00	\$0.00	\$0.00
	UNIT COST	0.0000	0.0000	0.0000	0.0000
	OIL BTUS(X1000)	0	0	0	0
TOTAL HEATING BTU (X100k)	QUANTITY-BTU(X1K)	0	0	0	0
ELECTRICITY	QUANTITY-KWH	727,680	1,204,800	691,200	1,070,400
	# BILLING DAYS	26	29	29	32
	KWH PER DAY	27,988	41,545	23,834	33,450
	COST-\$	\$36,089.46	\$55,056.45	\$46,912.74	\$56,136.57
	UNIT COST	0.050	0.046	0.068	0.052
	QUANTITY KW	2,064	2,136	2,184	2,280
	COST-\$	\$13,721.47	\$17,158.48	\$18,149.04	\$18,946.80
	BTUS(X1000)	2,482,844	4,110,778	2,358,374	3,652,205
TOTAL CAMPUS BTU CONSUMPTION X 10MIL		248	411	236	365
# STEAM GENERATED		0	0	0	574,200
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		0.0%	0.0%	0.0%	50.0%
HEATING DEGREE DAY - ACTUAL (MAC)		30	0	0	123
COOLING DEGREE DAY - ACTUAL (MAC)		306	328	334	101
Chiller	New Central Plant	0	0	0	0
Run	Old Central Plant	484	713	744	121
Tims	Chapel	317	324	121	0

1995-96 FUEL AND ELECTRICITY CONSUMPTION

		JUNE	JULY	AUGUST	SEPT.
GAS	QUANTITY-CCF	0	0	0	22,499
	COST-\$	\$288.75	\$288.75	\$288.75	\$4,332.94
	UNIT COST				0.193
	CCF BTUS(X1000)	0	0	0	2,249,900
OIL	QUANTITY-GAL	0	0	0	0
	COST-\$	\$0.00	\$0.00	\$0.00	\$0.00
	UNIT COST	0.0000	0.0000	0.0000	0.0000
	OIL BTUS(X1000)	0	0	0	0
TOTAL HEATING BTU (X100k)	QUANTITY-BTU	0	0	0	2,249,900
ELECTRICITY	QUANTITY-KWH	840,000	843,200	768,800	792,525
	# BILLING DAYS	32	33	31	30
	KWH PER DAY	26,250	25,552	46,913	26,418
	COST-\$	\$46,925.95	\$51,452.69	\$46,912.74	\$43,310.12
	UNIT COST	0.056	0.061	0.061	0.055
	QUANTITY KW	1,992	2,088	2,088	1,992
	COST-\$	\$16,553.52	\$19,086.41	\$17,929.65	\$14,404.55
	BTUS(X1000)	2,866,080	2,876,998	2,623,146	2,704,095
TOTAL CAMPUS BTU CONSUMPTION X 10MIL		287	288	262	495
# STEAM GENERATED		0	0	0	574,200
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		0.0%	0.0%	0.0%	50.0%
HEATING DEGREE DAY - ACTUAL (MAC)		30	0	0	188
COOLING DEGREE DAY - ACTUAL (MAC)		287	266	176	101
Chiller	New Central Plant	0	0	0	0
Run	Old Central Plant	288	293	381	96
Tims	Chapel	217	254	346	85

1996-97 FUEL & ELECTRICITY CONSUMPTION

		OCT	NOV	DEC	JAN
GAS	QUANTITY-CCF	81,367	126,255	16,118	98,509
	COST-\$	\$18,560.04	\$37,777.07	\$6,646.08	\$39,381.01
	UNIT COST	0.228	0.299	0.412	0.400
	CCF BTUS(X1000)	8,136,700	12,625,500	1,611,800	9,850,900
#2 FUEL OIL	QUANTITY-GAL	0	0	7,503	0
	COST-\$	\$0.00	\$0.00	\$5,605.12	\$0.00
	UNIT COST	0.0000	0.0000	0.7471	0.0000
#6 FUEL OIL	QUANTITY-GAL	0	16,706	97,039	58,144
	COST-\$	\$0.00	\$7,259.55	\$44,298.33	\$36,738.05
	UNIT COST	0.0000	0.4345	0.4565	0.6318
	OIL BTUS(X1000)	0	2,505,900	15,598,767	8,721,600
TOTAL HEATING BTU (X100k)	QUANTITY-BTU(x1K)	8,136,700	15,131,400	17,210,567	18,572,500
ELECTRICITY	QUANTITY-KWH	960,000	998,400	1,039,898	1,074,562
	# BILLING DAYS	29	31	31	31
	KWH PER DAY	33,103	32,206	33,545	34,663
	COST-\$	\$44,123.59	\$45,668.97	\$44,214.67	\$45,688.50
	UNIT COST	0.046	0.046	0.043	0.043
	QUANTITY KW	1,968	2,112	1,968	1,968
	COST-\$	\$11,138.88	\$11,953.92	\$11,510.17	\$11,510.17
	BTUS(X1000)	3,275,520	3,406,541	3,548,132	3,666,406
	TOTAL CAMPUS BTU CONSUMPTION X 10MIL	1,141	1,854	2,076	2,224
# STEAM GENERATED		5,425,815	8,772,900	12,387,800	12,821,000
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		75.0%	80.0%	79.9%	78.0%
HEATING DEGREE DAY - ACTUAL (MAC)		438	1,100	1,399	1,502
COOLING DEGREE DAY - ACTUAL (MAC)		8	0	0	0
Chiller	New Central Plant	0	0	0	0
Run	Old Central Plant	0	0	0	0
Times	Chapel	0	0	0	0

1995-96 FUEL AND ELECTRICITY CONSUMPTION

		OCT.	NOV.	DEC.	JAN.
GAS	QUANTITY-CCF	71,874	124,967	15,628	38,586
	COST-\$	\$14,332.72	\$26,664.34	\$4,008.10	\$9,736.11
	UNIT COST	0.199	0.213	0.256	0.252
	CCF BTUS(X1000)	7,187,400	12,496,700	1,562,800	3,858,600
OIL	QUANTITY-GAL	0	328	80,959	81,271
	COST-\$	\$0.00	\$78.88	\$22,182.33	\$23,135.94
	UNIT COST	0.0000	0.2405	0.2740	0.2847
	OIL BTUS(X1000)	0	0	12,143,850	12,190,650
TOTAL HEATING BTU (X100k)	QUANTITY-BTU	7,187,400	12,496,700	13,706,650	16,049,250
ELECTRICITY	QUANTITY-KWH	924,000	955,460	987,320	987,320
	# BILLING DAYS	31	30	31	31
	KWH PER DAY	29,806	31,849	31,849	31,849
	COST-\$	\$41,541.30	\$41,915.28	\$43,312.45	\$43,312.45
	UNIT COST	0.045	0.044	0.044	0.044
	QUANTITY KW	1,608	1,776	1,776	1,776
	COST-\$	\$10,019.17	\$11,003.00	\$11,369.81	\$11,369.81
	BTUS(X1000)	3,152,688	3,260,030	3,368,736	3,368,736
	TOTAL CAMPUS BTU CONSUMPTION X 10MIL	1,034	1,576	1,708	1,942
# STEAM GENERATED		4,792,900	8,772,900	11,500,000	12,821,000
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		77.0%	80.0%	79.9%	78.0%
HEATING DEGREE DAY - ACTUAL (MAC)		485	1,038	1,346	1,596
COOLING DEGREE DAY - ACTUAL (MAC)		0	0	0	0
Chiller	New Central Plant	0	0	0	0
Run	Old Central Plant	0	0	0	0
Times	Chapel	0	0	0	0

1996-97 FUEL & ELECTRICITY CONSUMPTION

		FEB	MAR	APR	MAY
GAS	QUANTITY-CCF	145,926	131,763	79,531	52,187
	COST-\$	\$41,494.11	\$25,949.29	\$16,174.57	\$12,108.04
	UNIT COST	0.284	0.197	0.203	0.232
	CCF BTUS(X1000)	14,592,600	13,176,300	7,953,100	5,218,700
#2 FUEL OIL	QUANTITY-GAL	0	0	0	0
	COST-\$	\$0.00	\$0.00	\$0.00	\$0.00
	UNIT COST	0.0000	0.0000	0.0000	0.0000
#6 FUEL OIL	QUANTITY-GAL	0	0	0	0
	COST-\$	\$0.00	\$0.00	\$0.00	\$0.00
	UNIT COST	0.0000	0.0000	0.0000	0.0000
	OIL BTUS(X1000)	0	0	0	0
TOTAL HEATING BTU (X100k)	QUANTITY-BTU(X1K)	14,592,600	13,176,300	7,953,100	5,218,700
ELECTRICITY	QUANTITY-KWH	1,135,139	1,036,800	972,000	1,072,800
	# BILLING DAYS	28	30	30	33
	KWH PER DAY	40,541	34,560	32,400	32,509
	COST-\$	\$47,543.95	\$44,095.82	\$46,660.08	\$46,988.51
	UNIT COST	0.042	0.043	0.048	0.044
	QUANTITY KW	1,896	1,920	2,256	1,896
	COST-\$	\$11,320.00	\$10,867.20	\$12,768.96	\$10,731.36
	BTUS(X1000)	3,873,094	3,537,562	3,316,464	3,660,394
TOTAL CAMPUS BTU CONSUMPTION X 10MIL		1,847	1,671	1,127	888
# STEAM GENERATED		12,169,200	11,673,700	7,675,000	2,932,600
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		78.2%	79.0%	76.0%	77.0%
HEATING DEGREE DAY - ACTUAL (MAC)		1,063	945	481	216
COOLING DEGREE DAY - ACTUAL (MAC)		0	0	0	35
Chiller	New Central Plant	0	0	0	123
Run	Old Central Plant	0	0	0	0
Tims	Chapel	0	0	0	0

1995-96 FUEL AND ELECTRICITY CONSUMPTION

		FEB.	MARCH	APRIL	MAY
GAS	QUANTITY-CCF	84,366	84,280	90,722	33,710
	COST-\$	\$20,181.24	\$18,700.05	\$26,100.05	\$8,030.53
	UNIT COST	0.239	0.222	0.288	0.238
	CCF BTUS(X1000)	8,436,600	8,428,000	9,072,200	3,371,000
OIL	QUANTITY-GAL	39,036	31,245	0	0
	COST-\$	\$18,007.18	\$15,419.94	\$0.00	\$0.00
	UNIT COST	0.4613	0.4935	0.0000	0.0000
	OIL BTUS(X1000)	5,855,400	4,686,750	0	0
TOTAL HEATING BTU (X100k)	QUANTITY-BTU	14,292,000	13,114,750	9,072,200	3,371,000
ELECTRICITY	QUANTITY-KWH	972,580	972,500	947,890	845,230
	# BILLING DAYS	29	31	30	31
	KWH PER DAY	33,537	31,371	31,596	27,265
	COST-\$	\$41,359.76	\$43,473.70	\$43,714.81	\$44,719.41
	UNIT COST	0.043	0.045	0.046	0.053
	QUANTITY KW	1,776	1,920	1,920	1,992
	COST-\$	\$12,669.70	\$11,229.44	\$11,740.28	\$13,868.76
	BTUS(X1000)	3,318,443	3,318,170	3,234,201	2,883,925
TOTAL CAMPUS BTU CONSUMPTION X 10MIL		1,761	1,643	1,237	625
# STEAM GENERATED		9,994,238	7,865,832	7,595,000	2,355,000
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		78.2%	75.0%	77.0%	87.0%
HEATING DEGREE DAY - ACTUAL (MAC)		1,275	1,155	608	200
COOLING DEGREE DAY - ACTUAL (MAC)		0	0	0	29
Chiller	New Central Plant	0	0	0	0
Run	Old Central Plant	0	0	0	88
Tims	Chapel	0	0	0	57

1996-97 FUEL & ELECTRICITY CONSUMPTION
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YTD TOTAL

GAS	QUANTITY-CCF	731,656
	COST-\$	\$199,245.21
	UNIT COST	0.272
	CCF BTUS(X1000)	73,165,600
#2 FUEL OIL	QUANTITY-GAL	7,503
	COST-\$	\$5,605.12
	UNIT COST	0.0000
#6 FUEL OIL	QUANTITY-GAL	171,889
	COST-\$	\$88,295.93
	UNIT COST	0.5137
	OIL BTUS(X1000)	26,826,267
TOTAL HEATING BTU (X100k)	QUANTITY-BTU(X1K)	99,991,867
ELECTRICITY	QUANTITY-KWH	11,983,679
	# BILLING DAYS	359
	KWH PER DAY	33,381
	COST-\$	\$559,179.31
	UNIT COST	0.047
	QUANTITY KW	24,648
	COST-\$	\$159,776.45
	BTUS(X1000)	40,888,313
<u>TOTAL CAMPUS BTU CONSUMPTION X 10MIL</u>		14,088
# STEAM GENERATED		74,432,215
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		74.8%
HEATING DEGREE DAY - ACTUAL (MAC)		7,297
COOLING DEGREE DAY - ACTUAL (MAC)		1,112
Chiller	New Central Plant	123
Run	Old Central Plant	2,062
Times	Chapel	762

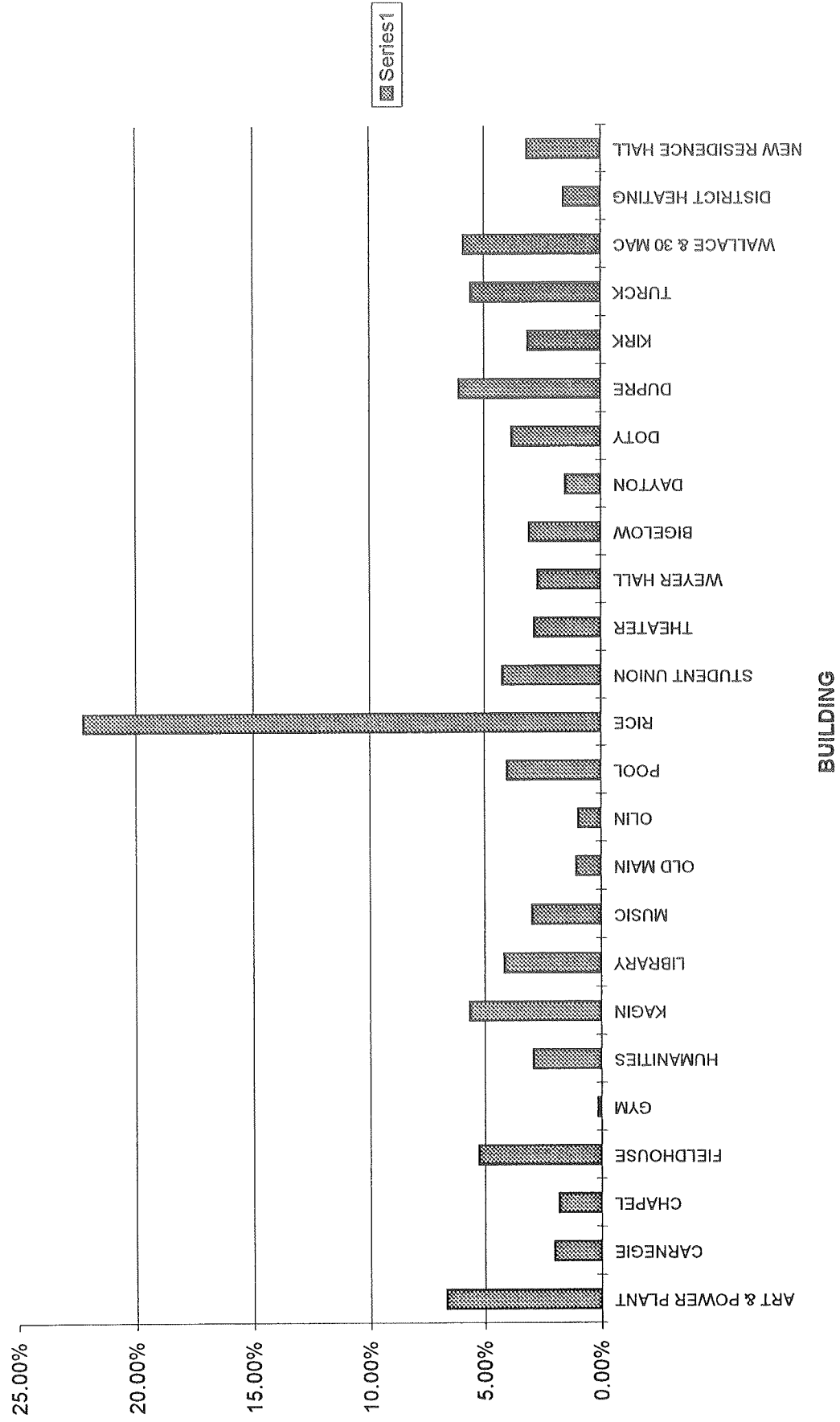
1995-96 FUEL AND ELECTRICITY CONSUMPTION
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YTD TOTAL

GAS	QUANTITY-CCF	566,632
	COST-\$	\$132,952.33
	UNIT COST	0.235
	CCF BTUS(X1000)	56,663,200
OIL	QUANTITY-GAL	232,839
	COST-\$	\$78,824.27
	UNIT COST	0.3385
	OIL BTUS(X1000)	34,876,650
TOTAL HEATING BTU (X100k)	QUANTITY-BTU	91,539,850
ELECTRICITY	QUANTITY-KWH	10,836,825
	# BILLING DAYS	370
	KWH PER DAY	29,289
	COST-\$	\$531,950.66
	UNIT COST	0.049
	QUANTITY KW	22,704
	COST-\$	\$161,244.10
	BTUS(X1000)	36,975,247
<u>TOTAL CAMPUS BTU CONSUMPTION X 10MIL</u>		12,852
# STEAM GENERATED		66,271,070
BOILER EFFICIENCY (BTU STEAM/BTU FUEL)		75.8%
HEATING DEGREE DAY - ACTUAL (MAC)		7,921
COOLING DEGREE DAY - ACTUAL (MAC)		859
Chiller	New Central Plant	0
Run	Old Central Plant	1146
Times	Chapel	959

Chart1

1996-97 CONDENSATE BY BUILDING



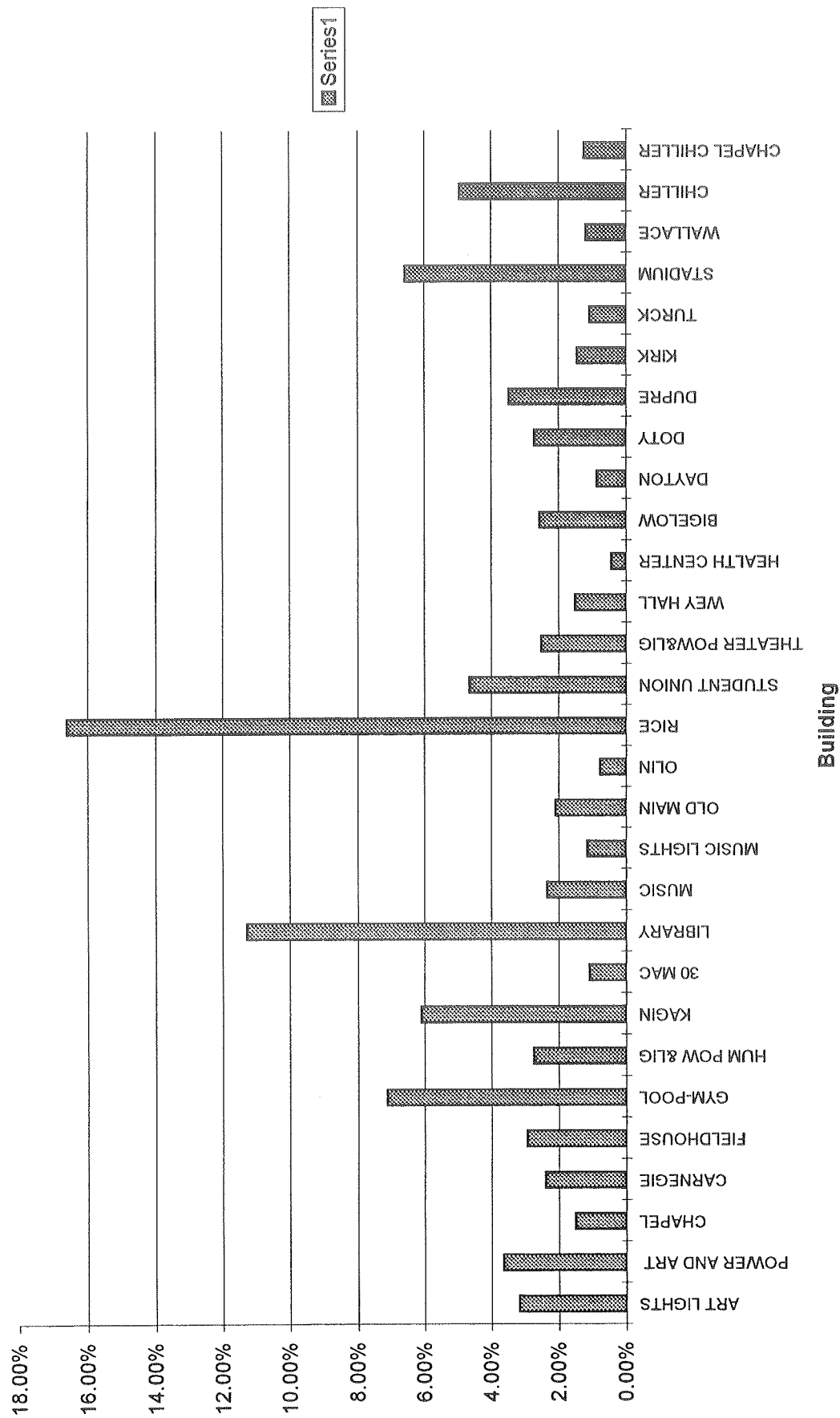
METER READINGS CONDENSATE PER BUILDING	MAY READING	JUN	JUL	AUG READING	UNITS	SEP 10/16 READING	UNITS	OCT 11/05 READING	UNITS
ART & POWER PLANT	400,280	0	0	0	0	413,310	13,030	427,850	14,540
CARNEGIE	1,699,990	0	0	0	0	5,550	5,550	15,350	11,555
CHAPEL	1,315,700	0	0	0	0	1,321,490	5,790	1,330,070	8,580
FIELDHOUSE	3,795,050	0	0	0	0	3,819,430	24,380	3,848,400	28,970
GYM	116,560	0	0	0	0	116,590	30	117,240	650
HUMANITIES	3,150,850	0	0	0	0	3,156,720	5,870	3,169,210	12,490
KAGIN	284,510	0	0	0	0	320,940	36,430	346,450	25,510
LIBRARY	19,567,775	0	0	0	0	19,644,793	77,018	19,770,560	15,153
MUSIC	3,233,830	0	0	0	0	3,235,630	4,800	3,238,720	13,090
OLD MAIN	163,680	0	0	0	0	166,210	2,530	170,740	6,826
OLIN	3,879,890	0	0	0	0	0	0	0	0
POOL	2,883,180	0	0	0	0	2,905,910	22,730	2,924,020	18,110
RICE	0	0	0	0	0	43,800	43,800	126,300	82,500
STUDENT UNION	330,340	0	0	0	0	348,060	17,720	373,900	25,840
THEATER	2,390,010	0	0	0	0	2,394,880	4,870	2,406,300	11,420
WEYER HALL	1,250,130	0	0	0	0	6,540	6,540	16,530	9,990
BIGELOW	181,760	0	0	0	0	7,360	7,360	18,800	11,450
DAYTON	546,000	0	0	0	0	551,610	5,610	555,070	15,915
DOTY	967,820	0	0	0	0	990,310	22,490	1,012,190	21,880
DUPRE	410,510	0	0	0	0	431,500	20,990	449,360	17,860
KIRK	3,418,840	0	0	0	0	3,430,360	11,520	3,445,780	15,420
TURCK	805,370	0	0	0	0	833,640	28,270	860,140	26,500
WALLACE & 30 MAC	3,766,280	0	0	0	0	3,842,120	75,840	3,867,300	25,180
DISTRICT HEATING	1,585,730	0	0	0	0	1,589,220	3,490	1,597,420	8,200
NEW RESIDENCE HAL	0	0	0	0	0	0	0	0	0
					0		446,648		427,629

METER READINGS CONDENSATE PER BUILDING		NOV 12/04 READING	UNITS	DEC 1/7/97 READING	UNITS	JAN 2/3 READING	UNITS	FEB 3/5 READING	UNITS
ART & POWER PLANT		480,590	52,740	551,580	70,990	661,400	109,820	767,500	106,100
CARNEGIE		46,020	30,670	81,910	14,009	114,220	32,310	140,990	26,770
CHAPEL		1,351,280	21,210	1,380,510	29,230	1,405,880	25,370	1,425,990	20,110
FIELDHOUSE		3,907,780	59,380	3,979,700	71,920	4,060,660	80,960	4,113,090	52,430
GYM		119,030	1,790	121,690	2,860	124,330	2,640	125,800	1,470
HUMANITIES		3,203,710	34,500	3,246,480	42,770	3,286,080	39,600	3,322,220	36,140
KAGIN		418,270	50,362	489,220	70,950	526,330	37,110	638,010	111,680
LIBRARY		20,046,054	33,192	20,458,624	49,707	20,820,621	43,614	21,108,571	34,693
MUSIC		3,243,450	34,070	3,254,460	51,010	3,272,230	37,770	3,276,710	34,480
OLD MAIN		182,520	7,051	196,440	1,677	221,360	24,920	241,590	20,230
OLIN		0	0	0	73,967	0	0	0	0
POOL		2,960,520	36,500	3,008,620	48,100	3,062,460	53,840	3,109,800	47,340
RICE		402,500	276,200	781,800	349,300	1,108,270	358,470	1,333,650	225,380
STUDENT UNION		418,670	44,770	476,540	57,870	526,330	49,790	572,140	45,810
THEATER		2,440,330	34,030	2,485,790	45,460	2,522,500	37,010	2,555,670	33,870
WEYER HALL		42,320	25,790	74,230	31,910	107,200	63,308	133,980	26,780
BIGELOW		51,740	32,940	95,660	43,920	141,090	45,430	181,070	39,980
DAYTON		559,190	4,120	585,460	26,270	609,930	34,500	620,670	10,740
DOTY		1,072,150	59,960	1,099,610	27,450	1,103,520	79,448	1,111,640	8,120
DUPRE		462,860	13,500	566,700	103,840	662,520	95,820	751,360	88,840
KIRK		3,481,450	35,670	3,526,790	44,340	3,569,070	43,280	3,583,890	14,820
TURCK		911,560	51,420	981,870	70,310	1,048,810	66,940	1,122,140	73,330
WALLACE & 30 MAC		3,913,470	46,170	3,968,720	55,250	4,021,570	52,950	4,079,910	58,240
DISTRICT HEATING		1,621,360	23,940	1,652,280	30,920	1,672,670	20,390	1,688,830	16,160
NEW RESIDENCE HAL		0	0	0	0	80,400	80,400	169,000	85,600
			1,009,975		1,413,840		1,433,290		1,133,513

METER READINGS CONDENSATE PER BUILDING	MAR 4/1 READING	UNITS	APR 5/5 READING	UNITS	MAY 6/7	UNITS	TOTAL	% USE PER BUILDING
ART & POWER PLANT	839,980	72,480	892,790	52,810	909,940	17,150	509,550	5.64%
CARNEGIE	158,220	17,230	170,160	11,940	174,380	4,220	154,254	2.01%
CHAPEL	1,439,190	13,200	1,449,650	10,460	1,454,730	5,080	139,030	1.81%
FIELDHOUSE	4,149,230	36,140	4,180,410	31,180	4,197,200	16,790	402,150	5.24%
GYM	126,670	870	126,940	270	126,940	0	10,380	0.14%
HUMANITIES	3,345,120	22,900	3,365,220	20,100	3,374,190	8,970	223,340	2.91%
KAGIN	689,380	26,300	737,350	47,980	763,130	25,770	432,092	5.63%
LIBRARY	21,335,824	27,380	21,535,483	24,055	21,643,993	13,073	317,885	4.14%
MUSIC	3,278,270	21,660	3,279,520	21,250	3,280,620	8,100	226,130	2.95%
OLD MAIN	253,760	5,505	262,700	8,940	266,160	3,460	81,139	1.06%
OLIN	0	0	0	0	0	0	73,967	0.96%
POOL	3,145,940	28,574	3,184,040	38,100	3,199,860	15,820	309,114	4.03%
RICE	1,514,000	180,350	1,646,900	132,900	1,705,500	58,600	1,705,500	22.23%
STUDENT UNION	609,900	37,760	644,850	34,950	653,160	8,310	322,820	4.21%
THEATER	2,580,590	23,920	2,600,210	19,620	2,608,050	7,840	218,040	2.84%
WEYER HALL	153,260	19,280	168,680	15,420	175,420	6,740	205,758	2.68%
BIGELOW	208,010	26,940	227,930	19,920	235,280	7,350	235,280	3.07%
DAYTON	629,930	9,260	635,820	5,890	639,130	3,310	115,615	1.51%
DOTY	1,134,910	23,270	1,167,410	32,500	1,183,160	15,750	290,878	3.75%
DUPRE	811,970	60,610	855,910	43,940	875,190	19,280	464,680	6.06%
KIRK	3,612,290	28,400	3,645,860	33,670	3,666,570	10,710	237,730	3.10%
TURCK	1,180,510	58,370	1,221,250	40,740	1,231,200	9,950	425,830	5.55%
WALLACE & 30 MAC	4,133,290	53,380	4,192,350	59,060	4,215,870	23,520	449,590	5.66%
DISTRICT HEATING	1,698,871	10,041	1,704,520	5,649	1,706,390	1,870	120,660	1.57%
NEW RESIDENCE HAL	217,800	48,800	217,800	0	240,700	22,900	240,700	3.14%
		803,720		711,244		291,663	7,671,523	1

Chart1

1996-97 Electrical Consumption By Building



YEAR 1996-97

METER TYPE: ELECTRIC

LOCATION	Read Date: JUNE	7/1 JUN TOTAL	Read Date: JULY	8/7 JUL TOTAL	Read Date: AUGUST	9/6 AUG TOTAL	Read Date: SEP	10/16 SEP TOTAL	Read Date: OCTOBER
ART LIGHTS	89710	24360	91083	27460	92357	25480	94556	43980	95632
POWER AND ART	43933	61740	47128	95850	49855	81810	50908	43890	51286
CHAPEL	68375	21030	59333	28740	70093	22800	70781	20840	70999
CARNEGIE	15381	16830	16012	18930	16510	14940	17674	34920	18203
FIELDHOUSE	15436	25800	16347	27330	17501	34620	18151	19800	18631
GYM-POOL	89524	76200	90340	81600	91000	66000	91963	96300	92396
HUM POW & LIG	60352	23100	51230	26340	51981	22530	53415	43020	54037
KAGIN	40014	53760	40977	57780	42018	62460	43633	96900	44330
30 MAC	7399	9030	8918	11392.5	10180	9465	12306	15945	13302
LIBRARY	2817	100160	3189	119040	3490	96320	3997	162240	4218
MUSIC	64610	14840	65786	23520	66826	20800	68432	32120	69229
MUSIC LIGHTS	78935	9000	79471	10720	79899	8560	80711	16240	81104
OLD MAIN	72971	15560	73821	17000	74503	13640	75798	25900	76372
OLIN	0	92560	0	0	0	0	0	0	0
RICE	341137	154183	608926	166789	680374	173448	917727	237383	1024382
STUDENT UNION	14288	31960	15299	40440	16187	35520	17706	60760	18349
THEATER POW & LIG	75484	16420	76378	17880	77233	17100	79137	38080	79959
WEY HALL	55755	13340	55535	15600	57185	13000	58212	20540	58660
HEALTH CENTER	52861	3652.5	53576	5362.5	54258	5115	55048	5925	58431
BIGELOW	32273	15480	32668	17700	32852	17040	33422	34200	33684
DAYTON	77071	4865	77368	4455	77649	4215	78655	16090	79129
DOTY	22069	23250	23016	28410	23707	20730	25087	41400	25716
DUPRE	7409	19800	7959	22000	8485	21040	9887	56080	10552
KIRK	2895	2880	2920	4000	2948	4480	3071	19680	3136
TURCK	98068	6135	98533	6975	98906	5595	134	18420	714
STADIUM	68952	17800	69145	19300	69370	22500	69928	55800	70512
WALLACE	61478	5085	62325	6352.5	63068	5572.5	65531	18847.5	56818
CHILLER	69471	119800	74676	208200	78864	167520	79498	25360	79503
CHAPEL CHILLER	23582	33720	24855	50920	25933	43120	26160	9080	26179
SUBTOTAL		1,012,541		1,159,087		1,035,421		1,308,511	
MAIN METER		727,680		1,204,800		691,200		1,070,400	
% OF MAIN METER		139.15%		96.21%		149.80%		122.25%	

YEAR 1996-97

METER TYPE: ELECTRIC

LOCATION	11/05		Read Date: 12/04		Read Date: 1/7/97		Read Date: 2/3		Read Date: 3/5	
	OCT TOTAL	NOVEMBER	NOV TOTAL	DECEMBER	DEC TOTAL	JANUARY	JAN TOTAL	FEBRUARY	FEB TOTAL	
ART LIGHTS	21520	97453	36420	99277	36480	100839	31240	102656	36340	
POWER AND ART	7660	52005	21570	53014	30270	53902	26640	54608	21180	
CHAPEL	6540	71342	10290	71675	10080	72113	13050	72469	10680	
CARNEGIE	15870	19047	25320	19913	25980	20693	29970	21699	30180	
FIELDHOUSE	14100	19661	30900	20919	37740	22062	34290	23453	41730	
GYM-POOL	43300	93055	65900	93819	76400	94523	70400	95306	78300	
HUM POW & LIG	13660	54955	27540	55942	29610	56718	23280	57769	31230	
KAGIN	41820	45426	65760	46388	57720	47413	61500	48451	58140	
30 MAC	7470	14849	11602.5	16390	11557.5	17718	9960	19357	12392.5	
LIBRARY	70720	4584	117120	4972	124160	5315	109760	5730	132800	
MUSIC	15940	70395	23320	71500	22100	73077	31540	74424	26940	
MUSIC LIGHTS	7860	81714	12200	82327	12260	82934	12140	83608	13480	
OLD MAIN	11480	77536	23280	79025	29780	80182	23140	81596	28280	
OLIN	0	0	0	0	0	0	0	0	0	
RICE	106556	1209915	185533	1397574	187658	1547569	149995	1708865	162296	
STUDENT UNION	25720	19421	107200	20545	44960	21625	43200	22856	49240	
THEATER POW&LIG	18540	81509	30800	82855	26920	84283	28560	85796	30260	
WEY HALL	8960	59411	15020	60242	16620	61080	16760	61978	17960	
HEALTH CENTER	2872.5	56095	4980	56817	5415	57449	4740	58112	4972.5	
BIGELOW	15720	34176	29520	34730	33240	35258	31680	35850	35520	
DAYTON	7110	79834	10575	80406	8580	81014	9120	81766	11280	
DOTY	18870	26667	28530	27548	26430	28408	25800	29374	28980	
DUPRE	26600	11612	42400	12581	38760	13482	36040	14556	42860	
KIRK	10400	3271	21600	3390	19040	3536	23360	3667	20960	
TURCK	8700	1591	13155	2304	10695	3018	10710	3917	13485	
STADIUM	58400	71656	114400	72904	124800	74109	120500	75197	108800	
WALLACE	9277.5	68903	15637.5	70860	14802.5	72618	13250	74777	16192.5	
CHILLER	200	79503	0	79503	0	79503	0	79503	0	
CHAPEL CHILLER	750	26207	1120	26239	1280	26256	1080	26294	1120	
SUBTOTAL	599,725		1,091,693		1,063,139		991,715		1,065,599	
MAIN METER	960,000		998,400		1,039,898		1,074,562		1,135,139	
% OF MAIN METER	62.47%		109.34%		102.23%		92.29%		93.87%	

YEAR 1996-97

METER TYPE: ELECTRIC

Read Date: 3/28 MAR TOTAL Read Date: 5/5 APR TOTAL Read Date: 6/1 MAY TOTAL ANNUAL TOTAL

LOCATION

ART LIGHTS	4182	30520	6232	41000	7749	30340	385140	3.18%
POWER AND ART	55088	14400	55696	18240	56313	18510	441,660	3.65%
CHAPEL	72746	8310	73127	11430	73462	18935	182,525	1.51%
CARNEGIE	22455	22680	23427	29160	24169	25816	290,596	2.40%
FIELDHOUSE	24558	33150	25688	33900	26421	21937	355,297	2.93%
GYM-POOL	95938	63200	96722	78400	97349	62700	858,700	7.09%
HUM POW & LIG	58622	25890	59757	34050	60617	25800	331,060	2.73%
KAGIN	49374	55380	50585	72660	51467	52920	736,800	6.09%
30 MAC	20728	10282.5	22567	13792.5	23816	9367.5	132,158	1.09%
LIBRARY	6046	101120	6474	136960	6767	93760	1,354,150	11.27%
MUSIC	75321	17940	76710	27780	78130	28400	285,240	2.36%
MUSIC LIGHTS	84158	11000	84881	14460	85394	10260	138,180	1.14%
OLD MAIN	82707	22220	83973	25320	84838	17300	253,900	2.10%
OLIN	0	0	0	0	0	0	92,560	0.76%
RICE	1853717	143852	2035566	181849	2196597	151031	2,009,643	16.60%
STUDENT UNION	23786	37200	25039	50120	25911	34880	561,200	4.64%
THEATER POW&LIG	88635	57980	83708	260	89879	23420	304,320	2.51%
WEY HALL	62730	15040	63581	17020	64236	13100	182,960	1.51%
HEALTH CENTER	58658	4095	58107	3367.5	59317	1575	52,073	0.43%
BIGELOW	36329	28740	36838	30540	37178	20400	309,780	2.56%
DAYTON	82374	9120	83215	12615	83739	7860	104,085	0.86%
DOTY	30206	24960	31289	32490	32089	27600	327,450	2.70%
DUPRE	15438	35280	16616	47120	17388	30880	418,960	3.45%
KIRK	3781	18240	3901	19200	3972	11360	175,200	1.45%
TURCK	4620	10545	5678	15870	6295	9270	129,555	1.07%
STADIUM	75940	74300	76498	55800	76734	23600	796,000	6.57%
WALLACE	76484	12802.5	78518	15265	79746	9210	142,095	1.17%
CHILLER	79503	0	83	83	74779	74696	595,859	4.92%
CHAPEL CHILLER	26319	1000	26350	1240	26485	5400	149,540	1.24%

SUBTOTAL

889,247

1,019,982

870,328

12,106,985

1

MAIN METER

1,036,800

972,000

1,072,800

11,983,679

% OF MAIN METER

85.77%

104.94%

81.13%

101.03%

MACALESTER COLLEGE
MONTHLY ENERGY BUDGET REPORT
JUNE 1996 - MAY 1997

ENERGY TYPE	QUANTITY CONSUMED	EXPENDITURE	BUDGETED CONSUMPTION (BTUs/KWH)	BUDGETED TOTAL EXPENDITURE	ESTIMATED TOTAL CONSUMPTION	ESTIMATED TOTAL EXPENDITURE
	6/1/96 5/31/97	6/1/96 5/31/97	6/1/96 5/31/97	6/1/96 5/31/97	6/1/96 5/31/97	6/1/96 5/31/97
GAS (CCF)	731,656	\$199,245.21				
OIL (GAL.)						
#6	171,889	\$88,295.93				
#2	7503	\$5,605.12				
TOTAL BTUs (* 1,000)	99,991,867	\$293,146.26	90,000,000	\$237,500.00	99,991,867	\$293,146.26
ELEC. (KWH)	11,983,679	\$559,179.31	11,000,000	\$522,700.00	11,983,679	\$559,179.31
TOTAL EXPENDED	////////	\$846,720.45	////////	\$760,200.00	////////	\$852,325.57

VARIANCE:
BUDGT VS EST (\$92,125.57)
=====

FUEL VARIANCE

CONSUMPTION	\$26,367.43
PRICE	\$29,278.83
SUB-TOTAL	\$55,646.26

ELEC VARIANCE

CONSUMPTION	\$46,742.64
PRICE	(\$10,263.33)
SUB-TOTAL	\$36,479.31

TOTAL FUEL AND
ELEC VARIANCE \$92,125.57
=====

Chart5

3 Year Fuel Consumption & Cost Comparison

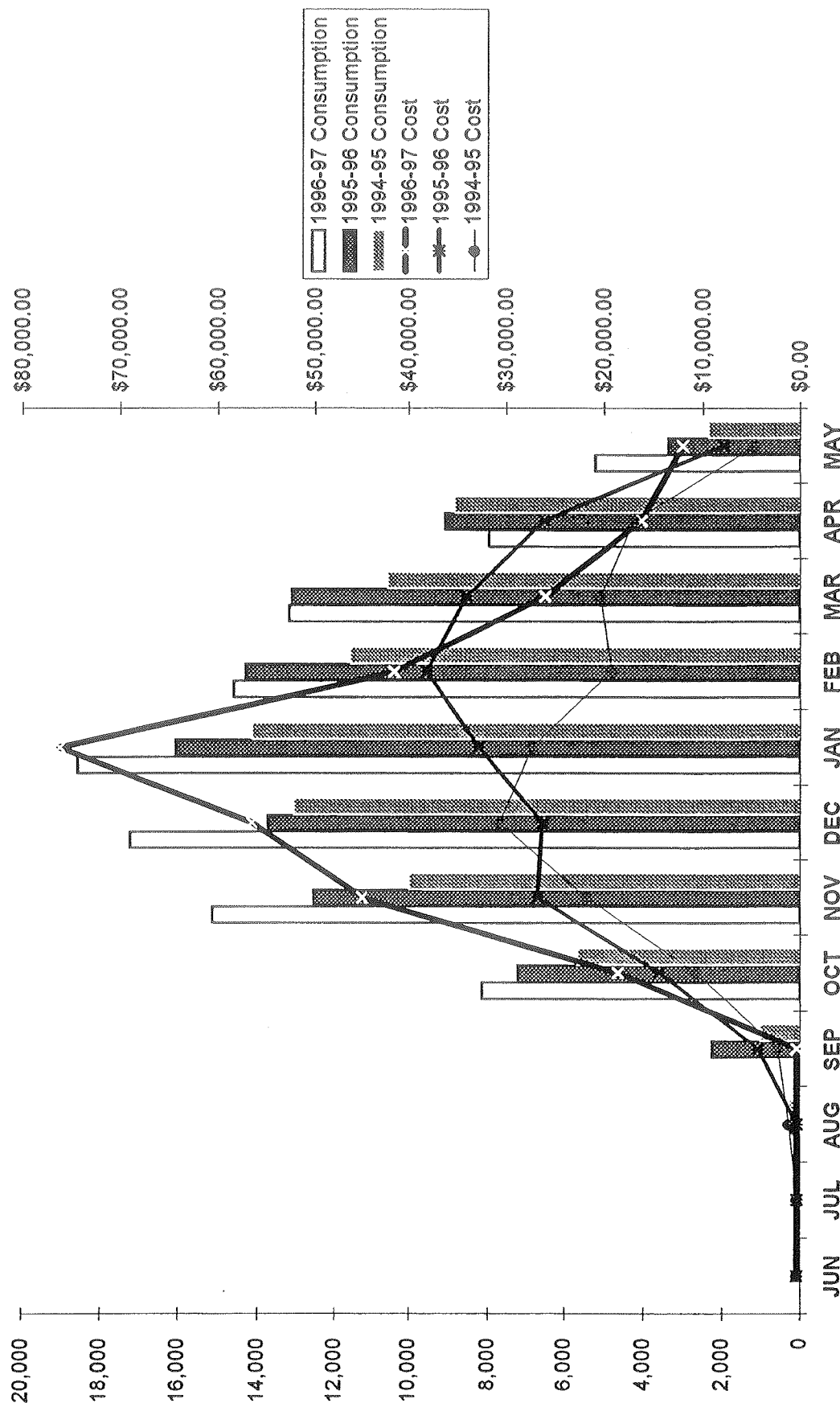
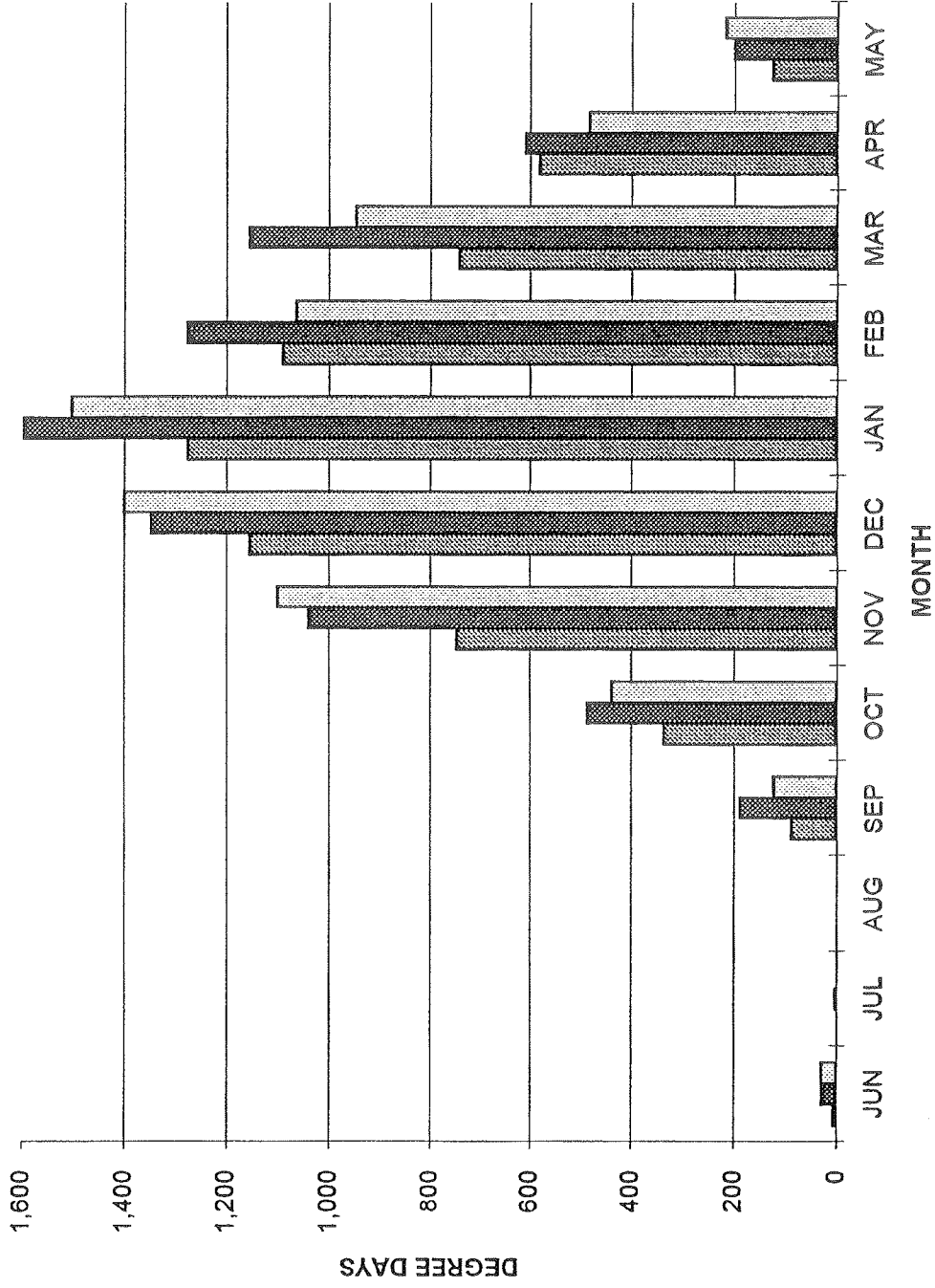


Chart2

3 YEAR HEATING DEGREE DAY COMPARSON



1994-95 HEATING DD (6,139) 1995-96 HEATING DD (7,923) 1996-97 HEATING DD (7,297)

Chart3

3 Electricity Consumption & Cost Comparison KWH & Dollars

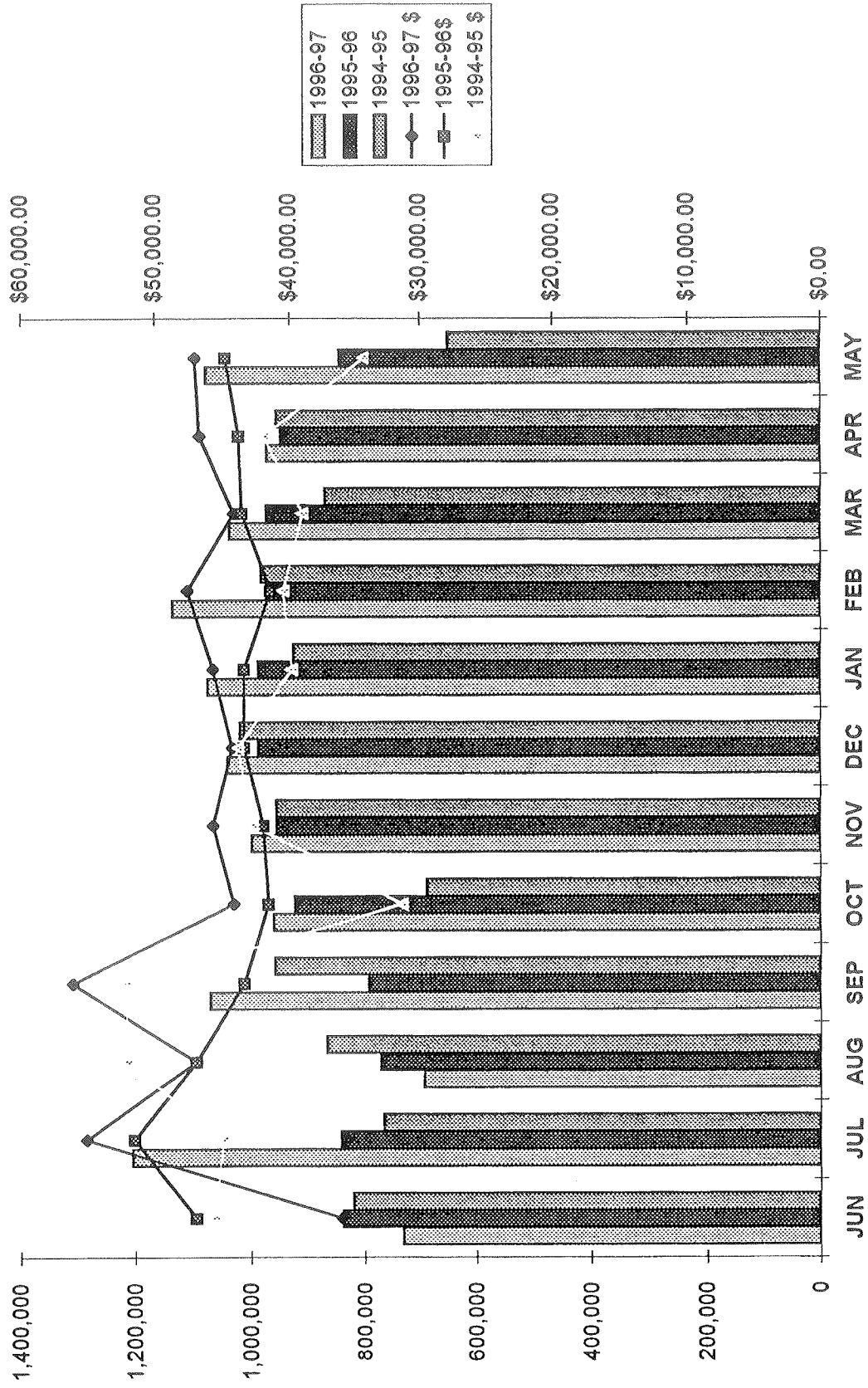
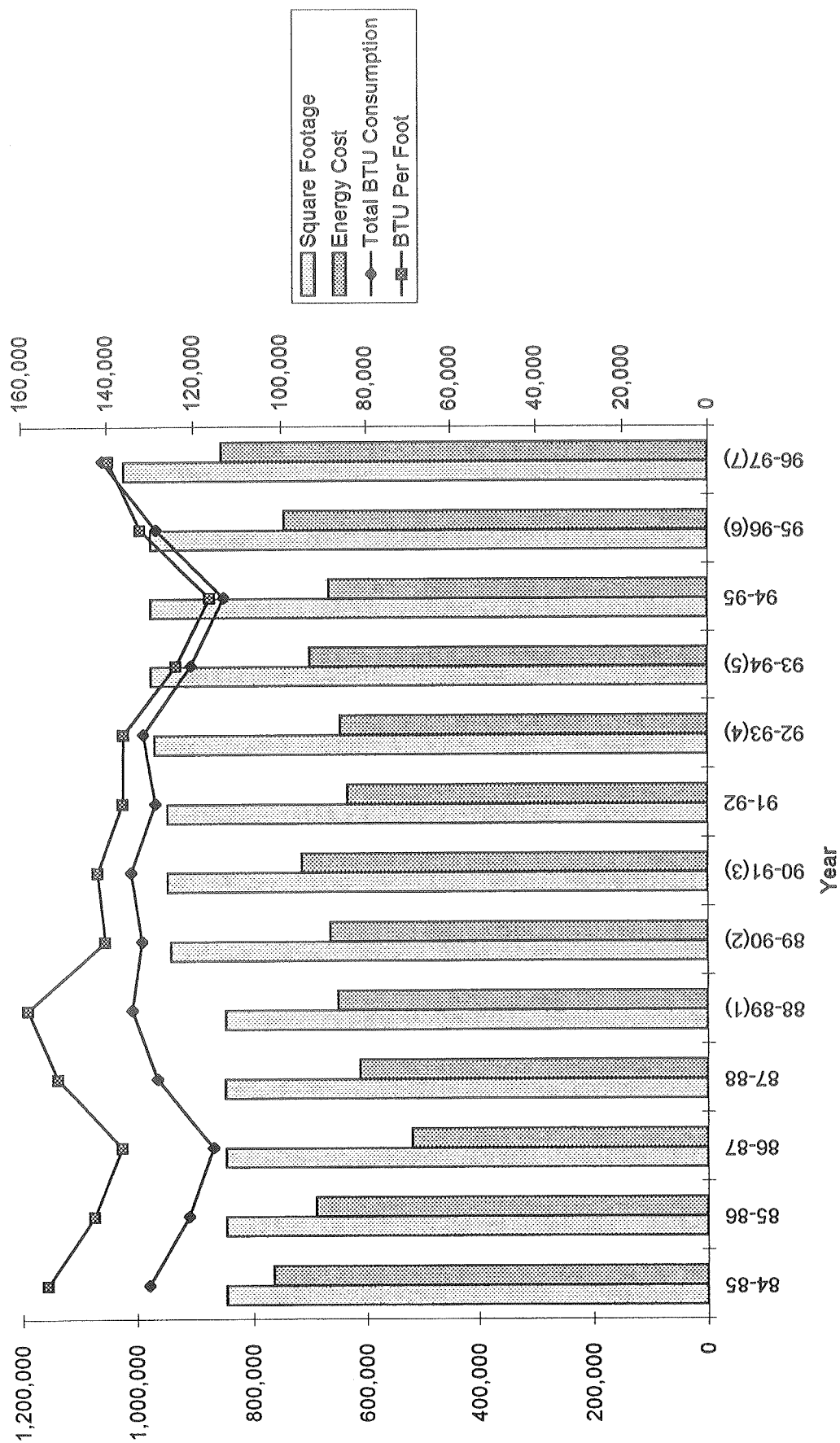


Chart1

Square Footage, Costs & Consumption



ENERGY CONSUMPTION
1984/85-1996/97

YEAR	ACTUAL DEGREE DAYS	BTUS CONSUMED x1,000,000	TOTAL FUEL COST	FUEL COST PER 100k BTU	KWH CONSUMED	TOTAL ELECTRIC COST	ELECT COST PER KWH	TOTAL SQUARE FEET	TOTAL BTU CONSUM (X1000k)	TOTAL BTU COST	BTU CONSUMP PER FOOT	COST per X1000K BTUS
84-85	7,632	100,514	\$401,058	0.3990	8,767,200	\$364,038	0.042	846,365	130,428	\$765,096	154,103	\$5.8661
85-86	7,852	91,852	\$328,917	0.3581	8,611,200	\$361,161	0.042	846,365	121,233	\$690,078	143,240	\$5.6921
86-87	6,238	86,956	\$186,058	0.2140	8,407,200	\$330,664	0.039	846,365	115,641	\$516,722	136,633	\$4.4683
87-88	7,138	98,071	\$235,637	0.2403	8,894,600	\$376,025	0.042	846,865	128,419	\$611,662	151,641	\$4.7630
88-89(1)	7,817	100,426	\$231,792	0.2308	9,900,000	\$418,470	0.042	846,365	134,205	\$650,262	158,566	\$4.8453
89-90(2)	8,181	99,062	\$232,017	0.2342	9,614,400	\$431,765	0.045	938,865	131,866	\$663,782	140,453	\$5.0337
90-91(3)	7,795	98,739	\$251,671	0.2549	10,459,200	\$463,053	0.044	944,865	134,426	\$714,724	142,270	\$5.3169
91-92	7,915	92,268	\$159,770	0.1732	10,699,200	\$473,973	0.044	944,865	128,774	\$633,743	136,288	\$4.9214
92-93(4)	7,296	95,977	\$165,834	0.1744	10,420,800	\$480,192	0.044	966,865	131,533	\$646,026	136,040	\$4.9115
93-94(5)	7,098	85,173	\$212,107	0.2231	10,384,173	\$487,722	0.047	972,865	120,604	\$699,829	123,968	\$5.8027
94-95	6,139	77,444	\$155,667	0.1637	10,454,200	\$509,883	0.049	972,865	113,140	\$665,550	116,296	\$5.8825
95-96(6)	7,921	91,589	\$211,776	0.2227	10,836,825	\$531,951	0.049	972,865	128,564	\$743,726	132,149	\$5.7849
96-97(7)	7,297	99,991	\$293,146	0.3083	11,983,679	\$559,179	0.049	1,018,615	140,880	\$852,326	139,404	\$5.8647

1. Library built and on line.
2. Weyerhaeuser Hall renovated--a/c added.
3. Carnegie Hall renovated--a/c added along with more usable area.
4. Humanities renovated--additional space and a/c.
5. Old Main renovated--additional space and a/c.
6. Rice renovation under way--construction heat throughout the year.
7. Rice operational with new mechanical systems, Olin's construction heat supplied by gas kiln meter--not reflected in this report.