1994 DEMAND SIDE MANAGEMENT
BASE PLANNING STUDY

**** DRAFT ****
VOLUME II.
THE PATTERNS OF ENERGY USE IN GAINESVILLE

GAINESVILLE REGIONAL UTILITIES
DECEMBER 12, 1994

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I. INTRODUCTION

END USE MODELS AND APPLIANCE SATURATIONS

Energy conservation measures are specific materials and devices applied to improve the efficiency by which a specific objective or end use is attained. For example, one conservation measure would be the replacement of an electric water heater with a gas water heater. To evaluate the cost-effectiveness and conservation potential of this measure, it is essential to estimate:

1. The energy that would saved from a given installation; and
2. The number of installations for which this conservation measure might be appropriate.

The tools used allow these quantities to be estimated are called "end use models" and "appliance saturation surveys." An end use model is developed by assigning customer energy use to certain functions, such as heating, air conditioning, water heating cooking, etc., a process which requires the application of a wide range of methodologies. These methodologies include manipulation of metered energy consumption records, seasonal demand analyses, multiple regression statistical studies (sometimes called conditional demand analyses), field monitoring programs, engineering calculations, and data reported in the literature from other studies. All of these techniques were applied by Gainesville Regional Utilities ("GRU") for its 1994 Demand Side Management Base Planning Study.

An essential component of any end use modelling effort is appliance saturation data. This is information on how many customers use a certain type of technology for a given function, or end use, typically expressed as a percentage. This information was collected from voluntary questionnaires administered to randomly selected customers. Additional information collected, and used in the end use models, included the age of key appliances (appliance vintages), energy using habits, and implementation of conservation measures, all of which are useful for estimating the efficiency of existing appliance stocks as a point of comparison to new appliances.

PURPOSE AND SCOPE

This report is the second volume of the five volumes comprising GRU's 1994 Demand Side Management Base Planning Study. The five volumes include:

I. The Value of Conservation for Gainesville Regional Utilities
II. Patterns of Energy Use in Gainesville
III. Technical and Achievable Potential
IV. Energy Conservation Measures
V. Market Segment Characterizations

The purpose of this report is to summarize the methodologies and data sources used to develop the end use models and appliance saturation information employed in the 1994 Demand Side Management Base Planning study. Volume V of the series contains full listings of the data bases into which the results of the studies described here were assembled, and upon which the overall study is based.

CUSTOMERS, ELECTRICAL CONSUMPTION AND DEMAND

Table I-1 contains the overall number of customers, electrical energy sales, and electrical power demands that comprise GRU's native load. The major end use sectors shown are residential, commercial, public lighting, and rental lighting. This information, taken from records for fiscal year 1993, was used to set the overall control totals for the allocation of energy and demand to various market segments and end uses. It is noteworthy that even though only 11% of GRU's customers are commercial, they account for half the total energy consumed by GRU's native load.

To avoid double counting transmission and distribution losses, the energy and demand values shown are those that would be measured at a customer's meter. The cost-effectiveness methodology employed by GRU adds these losses back into the calculations, and is fully described in Volume I of this series.

Not included in this table are GRU's off-system sales to the City of Alachua, the City of Starke, the Florida Municipal Power Authority, Interchange Economy Sales, or sales to Seminole Electric Cooperative ("Clay Electric"). These sales were excluded as GRU does not provide conservation services to these entities.

Energy by major sector was readily established from billing records, and the total coincident peak demand for native load is known by subtracting off-system sales, whose coincident peaks are known, from the total system peak of 339 MW (NEL) during the summer of 1993. Transmission and distribution losses of 6% (on peak) were subtracted to establish the metered native load coincident demand.

Coincident demand was further disaggregated using rate class load factors established by load research performed to support rate designs for various tariffs (Reference 2). A kilowatt-hour weighted average load factor was computed to combine GS, GSD, and Large Power rate categories in order to characterize commercial customers as a whole.

MARKET SEGMENTS FOR ANALYSIS

Residential and commercial customers have very different patterns of energy use and appliances. Furthermore, patterns of energy use vary within the residential customer class, For instance, apartments are very different than single family dwelling and mobile homes. The

differences among commercial establishments are even more profound. These differences affect the energy savings potential of various energy conservation measures in each market segment.

Tables I-1 and I-2 contain the categories of residences and end uses that were modelled separately as "Market Segments." Also shown in the tables are the subcategories of property types that were combined to make each category. These categories were taken from the Alachua County Property Appraiser's building use codes. This grouping of codes was also used to assemble building areas (in square feet) from property appraisal tax rolls.

As the study progressed some of the categories were combined. Thus while there were ten commercial market segments for which end use models were fully developed (see Volume V), some of the data presented in this report reflect twelve. The fast food category was eventually combined with the restaurant category; churches and industrial were combined into the miscellaneous category, in order to be consistent with groupings used in other Florida Public Service Commission studies.

OVERVIEW OF CONTENTS

This report is organized into three major sections, an introduction followed by the summaries and results of analyses for the residential and commercial sectors. For each of the sectors, the approach taken to allocate energy and demand to end uses are described, followed by a discussion of appliance saturations.

TABLE I-1
NATIVE LOAD CUSTOMERS, ELECTRICAL ENERGY SALES AND DEMAND
BY
MAJOR END USE SECTOR
(FY 1993)

SECTOR	CUSTOMERS	ENERGY (MWH)	% ENERGY	DEMAND[a] (MW)	% DEMAND
Residential	57,492	627,788	48.7%	147.8	49.6%
Commercial	6,891	646,309	50.1%	150.2	50.4%
Public Lighting[b,c]	NA	11,499	.9%	0	0
Rental Lights[c]	NA	4,878	.4%	0	0
Total Retail Sales[d]	64,369	1,290,479	100%	298.0	100%

Source: 1994 Customers, Sales and Revenues Forecast, GRU Strategic Planning Department. Excludes sales to Clay and Alachua.

[a] Estimated from 1990 Cost of Service Study load factors. Reflects coincident demand at customer's meter.
[b] Includes street and traffic lighting, traffic controls.
[c] Lighting does not contribute to summer peak demand.
[d] Percentages may not add due to rounding.

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TABLE I-2
RESIDENTIAL MARKET SEGMENT CODING SYSTEM

SINGLE FAMILY	SF

SINGLE FAMILY	SF
SINGLE FAMILY	100
SFR - MFG	200
SFR - ZERO LOT	300
EXC RESIDENTIAL	900
EXCEP DWELLING	2900

ATTACHED	AT

ATTACHED	AT
CONDO LOW RISE	1000
CONDO/APT	1100
CONDO TOWNHOUSE	1200
CONDOMINIUM	1300
COOP LOW RISE	1400
COOP HIGH RISE	1500
COOP TOWN HOUSE	1600
INTERV LO RISE	1800
INTERV HI RISE	1900
INTERV TOWNHOUSE	2000
APARTMENT	2600
DUPLEX	2700
TRI/QUADRAPLEX	2800

MOBILE HOMES	MH

MOBILE HOMES	MH
MH PRE 1977	700
MH POST 1977	800

Number reflects codes used in Alachua County Property Appraiser Records.

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TABLE I-3
COMMERCIAL MARKET SEGMENT CODING SYSTEM

OFFICE	OF
OFFICE LOW RISE	4900
OFFICE HI RISE	5000
OFFICE CONDO	5100
MEDICAL OFFICE	5200
THEATER	6100
BANK	6200
BRANCH BANK	6300
TRANS TERMINAL	7100
EXCEP OFFICE	7700
GOVMENTAL BLD	9300

RESTAURANT/BARS	RB
REST/BARS/CLUBS	**RB**
NIGHTCLUB/BAR	5500
RESTAURANT	5600
CLUBHOUSE	6900
FAST FOOD	**FF**
FAST FOOD	5700

SUPERMKT/GROCERY	SG
SUPERMKT/GROCERY	**SG**
SUPERMARKET	4200
SUPERMKT NBRHD/CV	4300
COLDSTRG/PCKG	7000

WAREHOUSE	WH
WAREHOUSE	**WH**
EXCEP STORE	7800
WRHSE DISTRIB.	8200
WRHSE MINI	8300
WRSHE STORAGE	8400
AIRCRAFT HANGAR	8500
BARNS	8600
PREFAB METAL	8700
SHED	8800

HOTEL/MOTEL	HM
HOTEL/MOTEL	**HM**
DORMITORY	1700
HOTEL	4400
HOTEL/MOTEL RES	4500
MOTEL LOW RISE	4600
MOTEL HI RISE	4700
NURS/CONV HOME	5400

RETAIL OUTLET	RO
STORE RETAIL	3500
STORE DISCOUNT	3600
STORE DEPT	3700
SH CTR NBRHD	3800
SH CTR COMMITY	3900
SH CTR REGIONAL	4000
SH CTR SUPREGNL	4100
SERVICE STATION	6400
VEH SLS/REPAIR	6600
MORTUARY	6800

SCHOOLS	SC
SCHOOLS	**SC**
SCHOOL	9000

COLLEGES	CO
COLLEGES	**CL**
EDU/RELIG MISC	9200

HOSPITALS	HS
HOSPITALS	**HS**
HOSPITAL	5300

MISCELLANEOUS	MS
INDUSTRIAL	**IN**
BOWLING ALLEY	5800
ARENA	5900
GARAGE	6500
SERVICE SHOP	6700
EXCEP COMMERC	7900
MFG LIGHT	8000
MFG HEAVY	8100
EXCEP INDUST	8900
CHURCH/AUDIT	**CA**
AUDITORIUM	6000
CHURCH	9100

Number reflects codes used in Alachua County Property Appraiser Records.

II. RESIDENTIAL END USES

ELECTRICAL CONSUMPTION AND DEMAND

This section will discuss the measure of central tendency used throughout the study, and how residential electrical consumption was disaggregated to various end uses. This disaggregation was based on seasonal trend analyses to establish base, heating and cooling uses. Base uses were further disaggregated using a technique known as conditional demand analysis supplemented with engineering calculations and published data from the literature.

Measures of Central Tendency

It was necessary to select a measure of central tendency to use in the end use models that were necessary to perform the 1994 Demand Side Management Base Planning Study. Arithmetic averages were employed, but a discussion of the variability in metered electrical consumption will facilitate a discussion of the methodologies applied and their potential biases.

Figure II-1 was prepared to illustrate the differences between mode, median and mean (average) electrical consumption, as well as to demonstrate the range of values that occur. Note that the data in Figure II-1 does not represent all residential customer, but only those with 12 months of continuous consumption at a single address. GRU has a high customer turn over in apartments, so single family unattached dwellings are primarily represented.

The frequency distribution is skewed, with lots of low consumption customers and fewer high consumption level customers (a typical "poisson" statistical distribution). While medians represents most customers, the resulting lower values ignore the fact that there may be greater conservation potential for higher use customers, making various conservation measures more cost effective. Average values were selected for analysis to provide a conservative basis for estimating conservation potential.

Seasonal Trend Analysis

One characteristic of Gainesville's climate is that there are several months during which residential customers do not need to use space heating or cooling. Figure II-2 illustrates how these seasonal trends can be used to divide up energy consumption to heating, cooling, and other (or base) uses.

Base, Cooling and Heating By Residential Market Segments

GRU's customer records allow residential accounts to be categorized as to whether they are attached (apartments, duplexes, quadraplexes, etc.), mobile homes, or single family

(unattached) dwellings. These are useful categories because of the differing sizes, modes of construction, and patterns of ownership (and propensity to invest) found in each group. These records were thereby categorized, and seasonal trend analyses performed on each market segment. The results are given in Table II-1.

Base End Uses

As shown in Table II-1, the single largest end use identifiable from analysis of billing records was "Base", which represents more than half of all residential electric sales. This category was further broken down using multivariate regression analysis to allow water heating energy use, clothes drying, and freezer energy use to be estimated from appliance and household information including income and number of occupants. Refrigeration, lighting, cooking, and clothes washing electrical use was developed using published values for various vintage machines and estimates of usage (References 3 and 4). The results are given in Table II-1A.

Application of Results To Competing Technologies

It is important to note that the end use data results provided in Table II-1 and II-1A characterize the average customer in each market segment. It may thus, for example, be a surprise to note that on the average, more electricity is used for refrigerators and freezers than for water heating. This result reflects the fact that 29.7% of all residences in GRU's service area use natural gas for water heating. In a household that does not use natural gas, electrical use for water heating would be much more than for refrigeration.

This is handled in the end use models characterizing each market segment by allocating various forms of energy within and end use between competing technologies. This concept is illustrated with the following simple, hypothetical example (see Volume V for complete listings of Market Segment End Use Models and actual data).

Unattached Residential Base Use	7,726	kwh/yr
Average For Water Heating	1,328	kwh/yr
46.5% Have Electric WH	2,855	kwh/yr each
53.5% Have Natural Gas	0	kwh/yr each

This approach is applied to the competing technologies for each end use in each market segment based on the relative electrical efficiency associated with each technology (natural gas water heaters having for all intents and purposes an infinite electrical efficiency, needing zero electricity). It should be noted, that as suggested by Figure II-1, there are lots of households that would use more than 2,855 kwh/yr for water heating, depending on personal habits, etc.

Electrical Demand

Table II-2 contains the results of allocating electrical demands to major residential market segments using load research data and billed energy data (Reference 2). These values were used within each Market Segment End Use Model (Volume V) to constrain the allocation of coincident peak demand to each end use and further, to each competing technology.

The coincident demand for each end use was established using a "duty cycle" method. The percent of time each end use was likely to be employed during on and off peak periods (as defined in Volume I) was employed to allocate the energy assigned to each end use technology. A coincident load factor was then calculated assuming uniform random use. To illustrate, heating technologies had zero duty cycle time during summer on peak periods, whereas air conditioners have a high percentage of use during summer months. A wide range of resources were reviewed as the basis upon which to make these assignments (References 5, 6, 7, 8, 9). All of the duty cycle assignments made are documented in Volume V.

Comparison to Other Utilities

Residential electrical use in Gainesville is the lowest per customer of any Utility required to annually submit energy use statistics in their Ten Year Site Plans to the Florida Department of Commerce. This is shown in Table II-3, which compares GRU average residential use to nine other companies for 1990 through 1993. This is due to a number of factors, including as the market penetration of natural gas, the housing mix and overall low income of the service territory, as well as the cumulative effect of GRU's previous conservation programs. The important implication of this data is that it suggests that there is less opportunity for conservation in GRU's customer base than other companies.

APPLIANCE SATURATION DATA BY MARKET SEGMENT

Appliance saturations were a key and integral part of developing the end use models described above. The complete set of data used is available from Reference 4. For convenience sake, key data elements have been summarized here, for the following end uses:

Table	Appliance Category
II-4	Space Cooling
II-5	Space Heating
II-6	Non Electric Space Heating
II-7	Water Heating

ENERGY CONSERVATION IMPLEMENTATION

One of the topics addressed in GRU's appliance survey, and relevant to the 1994 Demand Side Management Base Planning study is the installation of energy conservation measures (Reference 4). Some of the key findings are listed in Tables II-8 and II-9. Between 1998 and 1991 the most popular conservation measures were ceiling fans, weather stripping, and low flow shower heads and more efficient lighting. Not owning the dwelling, particularly in attached dwellings, was by far the most prevalent reason for not implementing more conservation, with money the next most cited reason.

CONSTRUCTION EFFICIENCY

Residential energy use per customer has historically been increasing at a very slow rate. GRU's econometric models forecast consumption per customer to continue increasing at even more slow rates (.67%) in the future, due to decreases in the real price of electricity and increases in real income (see Appendix A). Given the advent of Florida's energy efficiency building code standards in 1981, it is of interest to observe its effects on energy consumption.

Residential service locations were categorized as to their market segment (attached, mobile home, and unattached) at the year in which the structure was first served with electricity. Table II-10 contains the results of this analysis. No discernable effect from the building code standards were found.

NATURAL GAS SERVICE AVAILABILITY

Because GRU elected to evaluate fuel switching, or conversion to natural gas, conservation programs, it was necessary to establish the availability of gas to customers not currently using it. The dwellings which participated in the 1991 appliance saturation study (Reference 4) were evaluated by GRU's Gas Department to determine which ones has a gas line within 150 feet, a distance that is normally considered feasible to extend gas to serve a single customer. The results are summarized in Table II-11.

In the case of attached dwellings (apartments), if gas lines were not within 150 feet, an assessment was made to determine if an extension would be feasible if the whole complex were to be connected. The results were matched back to the original survey results to facilitate more detailed analysis of the joint probabilities of not having gas appliances and yet having gas available. The results are embodied in the models contained in Volume V.

SOLAR WATER HEATING

GRU co-funded with the Florida Public Service a significant study of the effects of solar water heaters on electric utilities, in which 10 conventional and 12 solar water heaters were carefully metered (Reference 6). The results of this study were similar to other studies (Reference 7).

One remaining question was the percentage of dwellings for which solar water heaters would get enough sunlight, particularly an issue in Gainesville with its extensive tree canopy. Another related to the long term operating costs of solar. Studies were performed to answer those questions.

Solar Fraction Survey

A random sample of dwellings was selected upon which to perform solar availability surveys. This involved climbing unto the roof, picking the most favorable site on the roof, and tracing the shade line as reflected onto the transparent cover of an instrument called the "solar pathfinder," which is specifically calibrated and designed for this purpose. Figure II-3 illustrates the resulting trace. This data can then be converted to a percent of maximum available solar energy for Gainesville's latitude and climate. In general, 70% is considered the minimum threshold for feasibility. The results are summarized in Table II-12.

Solar Operation and Maintenance

Recipients of low interest loans or solar bank grant funds through GRU's energy conservation program between 1984 and 1988 were asked to complete a questionnaire related to their purchasing decisions and the operation and maintenance of their system. The results are summarized in Table II-13.

It was apparent that only a very few (17.6%) would have purchased the system without federal subsidies (tax credits or grants). Federal tax credits reduced the cost of a solar system by 25% or more. A financing vehicle was less, but still critical, as only 35% would have purchased one with GRU's program.

Most systems were still in operation with 32% never having had a breakdown. Most systems had experienced failure at one time or another, mostly due to freezing or mechanical failure.

Figure II-1

Frequency Distribution of

Annual Residential Electrical Consumption

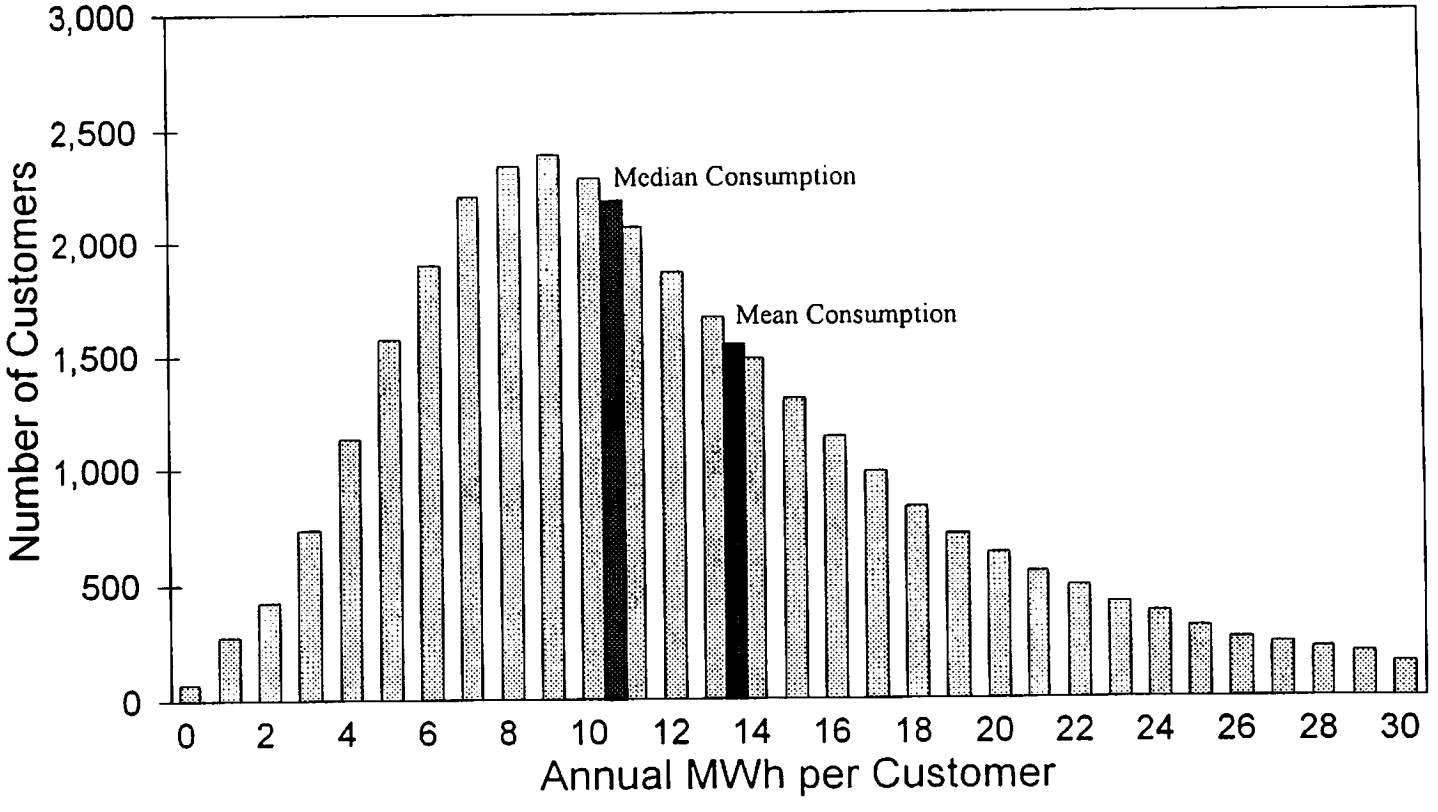

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Figure II-2
Seasonal Trend Analysis Methodology
(Total Residential Sales)

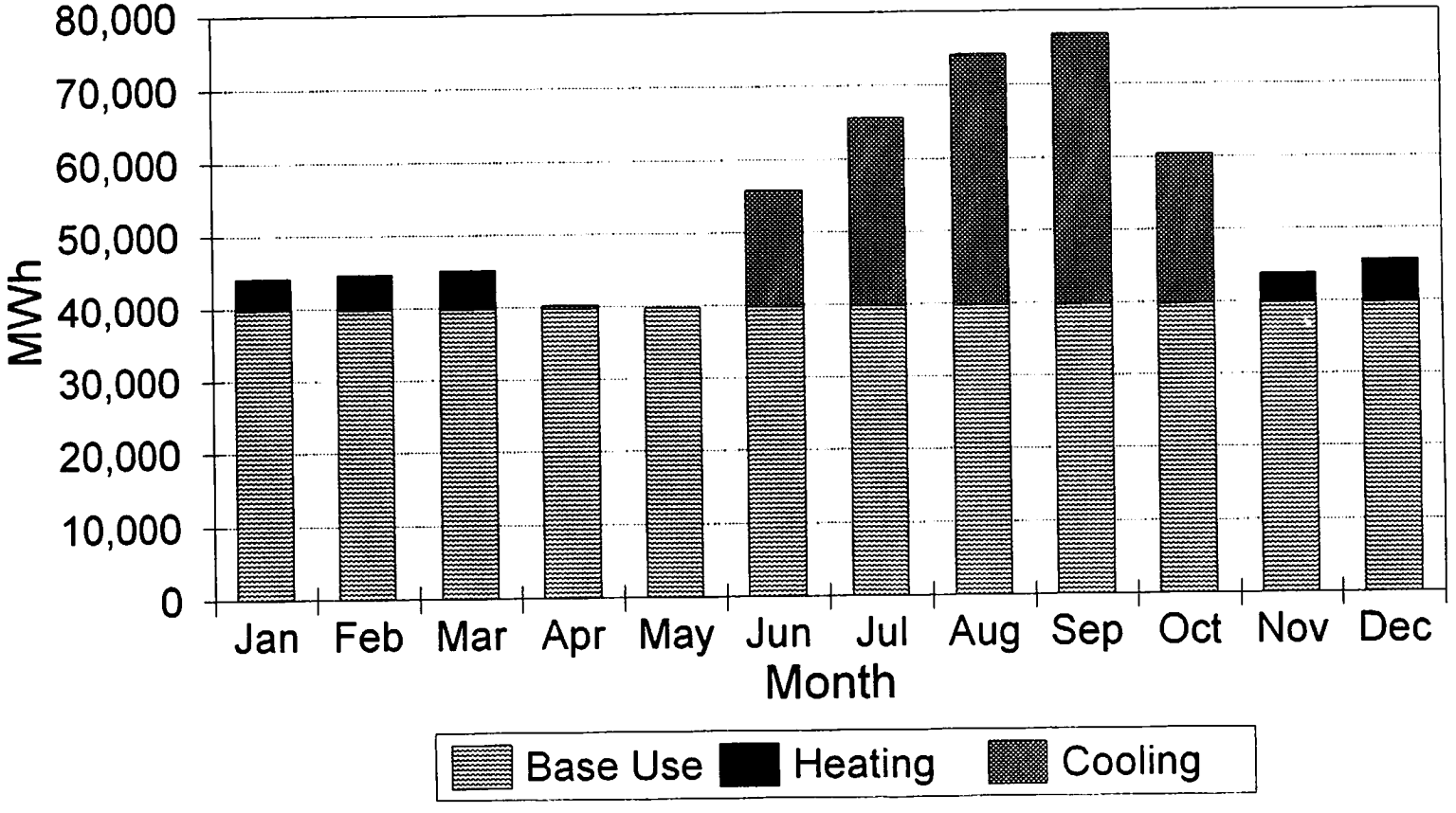

TABLE II-1
ELECTRICITY USED BY GRU RESIDENTIAL CUSTOMERS
IN FISCAL YEAR 1993

MARKET SEGMENT	NUMBER OF CUSTOMERS	END USE	ENERGY USE			
			MEAN (kWh/yr)	% MARKET SEGMENT	TOTAL (MWh/yr)	% TOTAL SALE
Attached Dwellings	24,542	Base	5,047	59.8%	123,854	19.7%
		Cool	2,416	28.6%	59,304	9.5%
		Heat	970	11.5%	23,798	3.8%
		Total	8,433	100%	206,957	33.0%
Mobile Homes	2,630	Base	4,932	56.7%	12,970	2.1%
		Cool	2,854	32.8%	7,506	1.2%
		Heat	911	10.5%	2,395	.4%
		Total	8,696	100%	22,872	3.6%
Unattached Dwellings	30,320	Base	7,726	58.7%	234,257	37.3%
		Cool	4,158	31.7%	126,057	20.0%
		Heat	1,242	9.6%	37,645	6.0%
		Total	13,125	100%	397,959	63.4%
All Residential	57,492	Base	6,454	58.5%	371,081	59.1%
		Cool	3,354	31.1%	192,867	30.7%
		Heat	1,110	10.3%	63,838	10.2%
		Total	10,918	100%	627,788	100%

SOURCE: Strategic Planning Department. Disaggregated into end use with season trend analysis. Percentages may not add due to rounding.

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TABLE II-1A
DETAILED RESIDENTIAL ELECTRICAL ENERGY END USE ALLOCATIONS

END USE	ATTACHED DWELLINGS (%)	MOBILE HOMES (%)	UNATTACHED SINGLE FAMILY (%)
Space Cooling	28.7%	32.8%	31.7%
Refrigeration	20.3%	19.2%	19.9%
Water Heating	17.5%	16.6%	17.2%
Space Heating	11.5%	10.5%	9.5%
Cooking	5.5%	5.2%	5.5%
Lighting	5.5%	5.2%	5.4%
Clothes Drying	3.7%	3.5%	3.6%
Dishwashing (w/o Hot Water)	1.8%	1.7%	1.8%
Clothes Washing (w/o Hot Water)	0.9%	0.9%	0.9%
Miscellaneous	4.6%	4.4%	4.5%
Total	100.0%	100.0%	100.0%

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TABLE II-2
RESIDENTIAL COINCIDENT DEMAND
BY
MARKET SEGMENT
(FISCAL YEAR 1993)

MARKET SEGMENT	DEMAND (MW)
Attached Dwellings	48.7
Mobile Homes	5.4
Unattached Single Family	93.7
Total	147.8

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TABLE II-3

Residential Energy Consumption Comparison
kiloWatt-Hours per Customer per Year

Utility	1990	1991	1992	1993
Jacksonville Electric Authority	14,062	13,728	13,883	14,142
Gulf Power Company	13,173	13,320	13,553	13,671
Tampa Electric Company	13,490	13,523	13,463	13,584
Lakeland Electric & Water	12,901	12,602	12,676	12,861
Florida Power Corporation	12,320	12,257	12,214	12,420
Orlando Utilities Commission	12,256	11,762	11,749	11,957
Florida Power & Light	11,955	12,084	11,745	12,227
City of Tallahassee	12,074	11,684	11,497	11,676
Seminole Electric Cooperative	11,114	11,163	11,251	11,539
Gainesville Regional Utilities	**11,023**	**10,906**	**10,746**	**10,912**

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Table II-4
Primary Space Cooling System
(values expressed in percent)

Type of Cooling System	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
CENTRAL AC	53.0	43.8	61.5	56.8
MULTI-ZONE AC	1.8	0.0	1.7	1.6
WINDOW/WALL AC	14.0	25.0	5.0	10.1
CENTRAL HEAT PUMP	28.7	18.8	24.1	25.7
MULTI-ZONE HEAT PUMP	0.6	0.0	1.7	1.1
WINDOW/WALL HEAT PUMP	1.2	0.0	0.7	0.9
NATURAL GAS AC	0.0	0.0	1.3	0.7
LP GAS AC	0.0	12.5	2.3	2.0
DO NOT KNOW	0.0	0.0	0.3	0.2
NO RESPONSE	0.6	0.0	1.3	0.9

Table II-5
Primary Electric Space Heating System
(values expressed in percent)

Electric Heating System	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
CENTRAL RESISTANCE HEAT	36.0	18.8	15.4	24.5
NON-CEN. ELEC. STRIP HEAT	4.9	0.0	1.0	2.6
PORTABLE ELEC. STRIP HEAT	0.6	12.5	1.3	1.7
CENTRAL AIR-AIR HEAT PUMP	17.1	6.3	17.4	16.6
CEN. WATER-AIR HEAT PUMP	0.6	0.0	2.7	1.6
WINDOW/WALL HEAT PUMP	1.2	0.0	0.3	0.7
UNSURE OF HEAT PUMP TYPE	8.5	0.0	3.7	5.5
OTHER	1.2	0.0	2.7	1.9
DO NOT KNOW	12.2	6.3	2.7	7.0
NO RESPONSE	17.7	56.3	52.8	37.9

Table II-6
Primary Non-Electric Space Heating System
(values expressed in percent)

Non-Electric Heat System	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
NATURAL GAS HEATER	12.2	18.8	47.8	30.7
LP GAS HEATER	0.6	18.8	5.7	4.3
OIL OR KEROSENE HEATER	0.0	12.5	4.0	2.8
WOOD STOVE/FIREPLACE	0.0	0.0	2.0	1.0
OTHER	0.6	0.0	0.3	0.4
DO NOT KNOW	2.4	0.0	0.7	1.4
DON'T HAVE HEATING	0.6	0.0	1.0	0.8
NO RESPONSE	83.5	50.0	38.5	58.6

Table II-7
Primary Water Heating Source
(values expressed in percent)

Type of Water Heater	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
ELECTRIC WATER HEATER	81.7	81.3	43.8	62.5
NATURAL GAS WATER HEATER	13.4	6.3	46.5	29.7
LP GAS WATER HEATER	0.0	6.3	5.7	3.3
OIL OR KEROSENE WATER HEATER	0.6	6.3	0.3	0.8
SOLAR WITH ELECTRIC BACKUP	0.0	0.0	1.7	0.9
HRU WITH ELECTRIC BACKUP	0.0	0.0	1.3	0.7
DO NOT KNOW	3.0	0.0	0.3	1.4
NO RESPONSE	1.2	0.0	0.3	0.7

Table II-7A
Refrigerator Saturation
(values expressed in percent)

Number of Refrigerators	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
1 FROST-FREE REFRIGERATOR	79.3	75.0	74.6	76.6
2 FROST-FREE REFRIGERATORS	0.6	6.3	19.7	10.6
+3 FROST-FREE REFRIGERATORS	0.6	0.0	0.7	0.6
1 MANUAL DEFROST REFRIG.	23.2	31.3	17.4	19.8
2 MANUAL DEFROST REFRIG.	0.0	0.0	2.3	1.2
+3 MANUAL DEFROST REFRIG.	0.0	0.0	0.3	0.2

Table II-7B
Age of Refrigerator
(values expressed in percent)

Age of Refrigerator	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
1 YEAR OLD REFRIGERATOR	6.1	6.3	9.7	7.9
2 YEAR OLD REFRIGERATOR	5.5	0.0	7.7	6.3
3-5 YEAR OLD REFRIGERATOR	32.3	25.0	26.1	28.7
6-9 YEAR OLD REFRIGERATOR	11.0	12.5	15.7	13.5
10-19 YEAR OLD REFRIGERATOR	18.9	25.0	30.4	25.1
20+ YEAR OLD REFRIGERATOR	0.6	12.5	3.7	2.9
NO RESPONSE	25.6	18.8	6.7	15.6

Table II-8
Conservation Measures Implemented Within Last Two Years
(values expressed in percent)

Conservation Measures	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
EFFICIENT AC INSTALLED	0.0	6.3	8.4	4.7
HP REPLACED RESISTANCE	0.6	0.0	0.7	0.6
GAS HEAT REP. ELECTRIC	0.0	0.0	1.0	0.5
CLOCK THERMOSTAT INSTALLED	1.8	0.0	3.0	2.3
WOOD STOVE INSTALLED	0.0	6.3	0.7	0.7
SOLAR WH INSTALLED	0.6	0.0	0.0	0.3
HRU INSTALLED	0.0	0.0	1.0	0.5
WATER HEATER TIMER INSTALLED	0.0	0.0	2.7	1.4
WATER HEATER JACKET INSTALLED	0.0	0.0	2.3	1.2
SHOWER HEAD INSTALLED	6.7	12.5	9.0	8.2
EFFICIENT REFRIG. PURCHASED	0.0	6.3	9.7	5.3
ATTIC INSULATION INSTALLED	0.0	0.0	5.4	2.7
WALL INSULATION INSTALLED	0.6	0.0	1.3	0.9
FLOOR INSULATION INSTALLED	0.6	0.0	1.7	1.1
RADIANT BARRIER INSTALLED	0.6	0.0	0.3	0.4
WEATHER STRIP INSTALLED	4.9	31.3	10.4	9.3
WINDOW SHADING INSTALLED	3.7	18.8	3.3	4.4
WINDOW REPLACEMENT	1.2	0.0	3.0	2.0
CEILING FAN INSTALLED	14.0	12.5	20.7	17.3
ATTIC FAN INSTALLED	0.0	6.3	1.3	1.1
EFFICIENT LIGHTING	4.3	6.3	11.0	7.8
OTHER CONSERVATION MEASURES	2.4	0.0	4.3	3.2

Table II-9
Reasons for Not Implementing More Conservation Measures
(values expressed in percent)

Reasons	*Attached Dwellings* Saturation	*Mobile Homes* Saturation	*Unattached Homes* Saturation	*All Dwellings* Saturation
NOT COST EFFECTIVE	1.8	12.5	18.4	10.9
DO NOT KNOW WHAT TO DO	9.8	25.0	18.1	15.0
CANNOT AFFORD IMPROVEMENTS	15.2	31.3	32.8	25.1
DO NOT HAVE TIME	5.5	18.8	8.7	8.0
HOME IS NEW	5.5	0.0	2.7	3.7
DO NOT OWN HOME	81.1	0.0	2.7	36.2
OTHER REASON	4.9	0.0	2.7	3.4

Table II-10

Gainesville Regional Utilities

TOTAL ANNUAL KWH CONSUMPTION BY HOUSING TYPE AND YEAR OF CONSTRUCTION

	SINGLE FAMILY UNATTACHED		*SINGLE FAMILY ATTACHED*		*MOBILE HOMES*		*ALL DWELLINGS*	
Year of First Connect	Number of Customers	ANNUAL USE (kWH)	Number of Customers	ANNUAL USE (kWH)	Number of Customers	ANNUAL USE (kWH)	Number of Customers	ANNUAL USE (kWH)
1980	18,925	14,273	12,500	9,033	1,311	9,515	32,736	12,082
1981	597	13,768	1,442	8,829	43	6,784	2,082	10,203
1982	391	14,226	440	9,284	34	9,616	865	11,531
1983	886	12,232	871	9,786	97	8,680	1,854	10,897
1984	807	12,958	1,189	9,595	78	9,705	2,074	10,908
1985	517	13,496	709	9,451	47	9,010	1,273	11,078
1986	510	13,899	866	8,654	93	7,250	1,469	10,386
1987	670	14,053	424	9,288	28	7,913	1,122	12,099
1988	1,181	16,390	536	9,965	53	9,418	1,770	14,236
1989	1,327	13,742	1,201	9,071	112	11,491	2,640	11,522
1990	1,043	12,723	1,422	9,117	149	9,338	2,614	10,568
1991	1,529	13,479	1,531	8,222	176	9,340	3,236	10,767
1992	863	11,691	968	8,008	128	8,717	1,959	9,677
1993	1,234	14,105	1,234	14,105	1,234	14,105	1,234	14,105
Totals	**30,480**	**13,645**	**25,333**	**9,458**	**3,583**	**9,349**	**56,928**	**11,433**

Table II-11

Gas Availability

(values expressed in percent)

	Attached Dwellings	*Mobile Homes*	*Unattached Homes*	*All Dwellings*
Type of Availability	Saturation	Saturation	Saturation	Saturation
NO GAS AVAILABLE	20.0	45.5	19.5	21.4
GAS AVAILABLE	26.7	54.5	80.5	55.7
GAS AVAILABLE - TO APT OWNER *	53.3	0.0	0.0	22.9

Note: Gas is available to these apartments, but the apartment owner chose not to use gas in each individual unit. Many of these complexes use gas for the common water heating.

TABLE II-12
RESULTS OF RESIDENTIAL SOLAR AVAILABILITY SURVEY

MARKET SEGMENT	AVERAGE SOLAR FRACTION	PERCENT SF >70%	N
Single Family	68%	44%	26
Attached	76%	75%	16
Mobile Homes	47%	36%	11

Source: Strategic Planning Department.

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FIGURE II-3
ILLUSTRATION OF SOLAR FRACTION DETERMINATION METHODLOGY

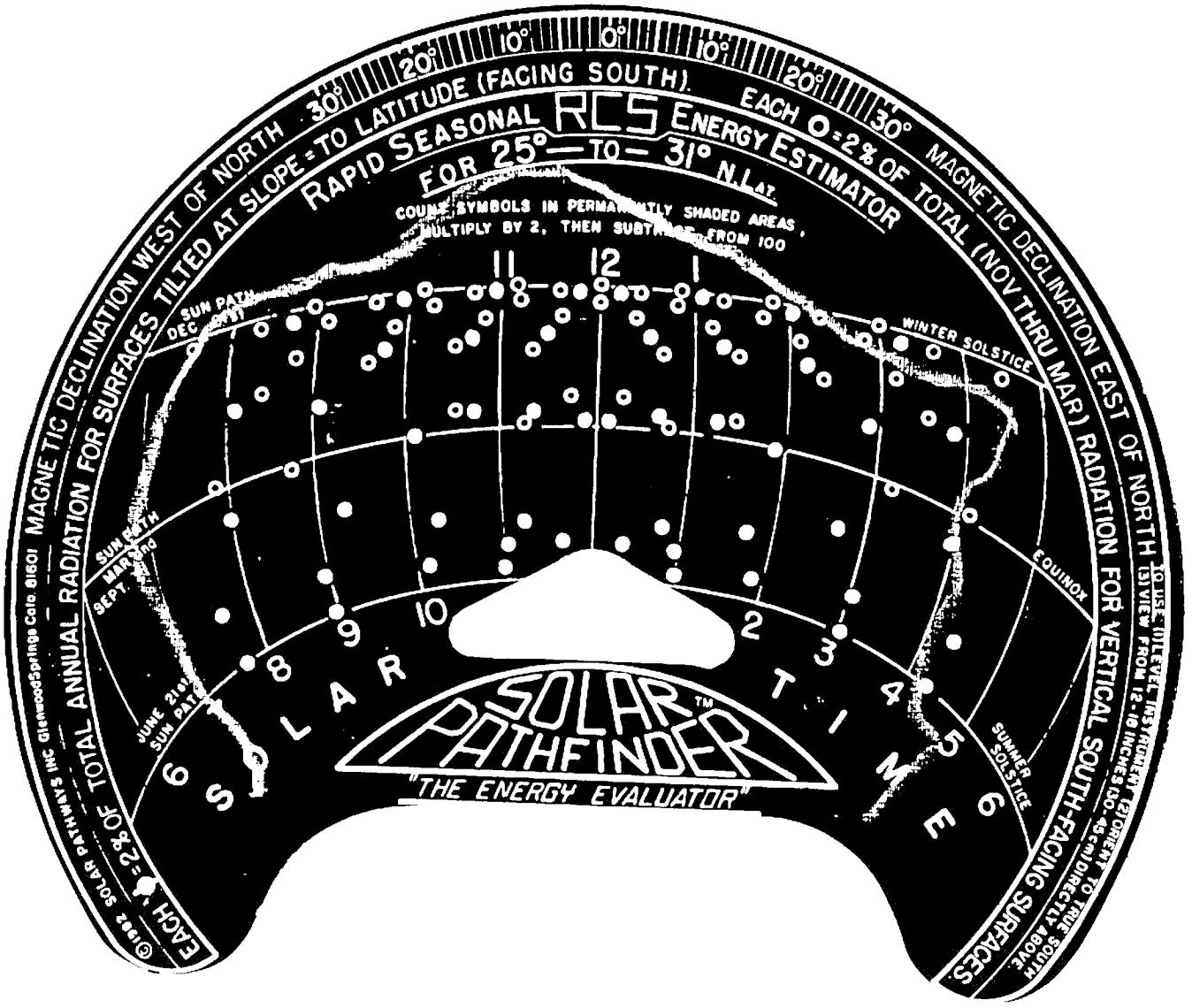

TABLE II-13
SUMMARY OF SOLAR
WATER HEATER LOAN RECIPIENT SURVEY

QUESTION	RESPONSE	PERCENT
Original Customer	Yes No	88.3% 11.7%
Would have bought system without federal incentive	Yes No, needed tax credit No, needed grant No, other reason No response	17.6% 38.2% 38.2% 4.4% 1.5%
Would have bought system with GRU financing	Yes, with cash Yes, with other loan No No response	10.3% 25.0% 61.8% 2.9%
Satisfied with GRU low interest loan	Very satisfied Satisfied Not satisfied Disappointed	79.4% 20.6% 0.0% 0.0%
Current condition of system	Operating Not Operating Removed by owner Removed by previous owner No response	93.5% 3.9% 0.0% 1.3% 1.3%
Operating experience (More than one response possible)	No Problem Lack of hot water Inconvenient Freeze Damage Collector Glass Broken Mechanical Failure Collector Fogged Other	32.5% 5.2% 3.9% 16.9% 5.2% 36.4% 2.6% 20.8%
Survey sample	Number surveyed Not deliverable Total respondents Percent respondents	117 6 77 69%

III. COMMERCIAL END USES

This section will discuss how commercial electrical consumption was disaggregated to various market segments and end uses. The use of this data, together with appliance saturations, to develop the end use end use models listed in Volume V, required the application of the same concepts and techniques as described above for residential market segments. The discussion of the measure of central tendency, competing end use technologies, and definitions of end uses will not be repeated here.

The application of seasonal trend analysis techniques as for the residential sector was not appropriate, since many commercial establishments in this climate find it necessary to air condition (cool) throughout the year. Furthermore, GRU has not conducted appliance saturation surveys at the commercial level. Instead, a sample of establishments for which detailed energy audits had been performed was used.

CUSTOMERS AND BUILDING AREAS

Prior to this study, commercial accounts in GRU's billing system were not coded to allow categorization into different market segments. In order to do so, 1,400 commercial accounts were categorized. The 700 largest commercial accounts, accounting for over 80% of GRU's commercial sales for native load, were listed and manually categorized, either by direct recognition, inspection of yellow page listings, or in some cases, phone calls. The same procedure was followed for a 10% sample of the remaining commercial customers. The resulting customer counts by category are provided in Table III-1.

In order to develop cost estimates and assist in energy use disaggregation (for instance, to convert typical lighting levels to total wattage), it was necessary to develop an estimate of building area for each commercial category. This was performed by grouping records from the property appraiser's tax rolls. The building areas for tax exempt entities, which have a significant presence in Gainesville were found to be poorly represented in the tax rolls, and thus for these entities were obtained directly. The results of this effort may be found in Table III-1.

POWER DEMAND

Non-coincident electrical demands were developed for each market segment using metered demand to energy ratios as available in each category from billing data. The observed load factors and estimated kilowatts for each are given in Table III-2. Quite a wide range was observed, with grocery stores having excellent load factors and schools and churches having relatively poor load factors. As indicated previously from Table I-1, the commercial sector's estimated coincident demand was estimated as 150 MW, 13% less than the estimated non-coincident demands, which were adjusted accordingly.

ELECTRICAL CONSUMPTION

A sample of detailed commercial energy audits was selected from GRU's files to form the basis of characterizing the end uses and appliances to be found in the various market segments. The selection was performed on the basis of the completeness of the energy audit (i.e. the full spectrum of appliances was evaluated), and the appropriateness of the establishment for its associated market segment. The data is thus not statistically random, but represents the best data available. Appendix B summarizes the results of the study.

The resulting end use breakdowns were then applied to the electrical and demand quantities established as described previously to develop the results summarized in Table III-3. Lighting was found to be the single largest end use, followed by cooling.

APPLIANCE SATURATIONS

Appliance saturations were taken from the audit sample described above, and supplemented with data from Reference 5. GRU's Gas Department gave assistance with developing estimate of gas appliance saturations. This information was assembled into the end use models found in Volume V.

TABLE III-1

Non-Residential Market Segment Characteristics
Number of Customers and Building Areas

Market Segment	Number of Customers	% of Customers	Square Footage	% of Sq. Ft.
College	3	0.0%	530,971	1.9%
Hotel/Motel	290	4.2%	2,343,154	8.6%
Hospital	60	0.9%	932,535	3.4%
Miscellaneous	2,512	36.5%	3,685,443	13.5%
Office	2,169	31.5%	6,019,431	22.1%
Restaurant/Bar	345	5.0%	450,405	1.7%
Retail Outlet	1,089	15.8%	6,139,862	22.5%
School	136	2.0%	581,655	2.1%
Supermarket/Grocery	103	1.5%	850,933	3.1%
Warehouse	184	2.7%	5,704,668	20.9%
Totals	**6,891**	**100.0%**	**27,239,057**	**100.0%**

TABLE III-2

Non-Residential Market Segment
Non-Coincident Billing Demands
July, 1993

Market Segment	Load Factor	Billing Demand (kW)
Church/Auditorium	0.1462	6,427
College	0.4148	3,070
Fast Food	0.2304	7,558
Hotel/Motel	0.5184	11,874
Hospital	0.6454	10,873
Industrial	0.4918	26,958
Miscellaneous	0.4398	11,361
Office	0.4578	31,255
Restaurant/Bar	0.4930	7,516
Retail Outlet	0.3104	34,094
School	0.2649	11,208
Supermarket/Grocery	0.6760	9,187
Warehouse	0.4070	1,526
Totals	**0.4398**	**172,908**

TABLE III-3

Non-Residential Electrical Allocation
By
Major End Use and Market Segment
(FY 1993)

Market Segment	End Use	End Use %		MWh
Church/Auditorium				
	Lighting	44.00%		3,622
	Heating	4.00%		329
	Cooling	42.00%		3,457
	Base:	10.00%		
	Water Heating		1.50%	123
	Refrigeration		2.50%	206
	Cooking		1.00%	82
	Ventilation		3.00%	247
	Miscellaneous		2.00%	165
	Total	**100.00%**		**8,231**
College				
	Lighting	53.00%		5,913
	Heating	4.00%		446
	Cooling	31.00%		3,458
	Base:	12.00%		
	Water Heating		1.50%	167
	Refrigeration		2.00%	223
	Cooking		1.50%	167
	Ventilation		5.00%	558
	Miscellaneous		2.00%	223
	Total	**100.00%**		**11,156**
Fast Food				
	Lighting	22.00%		3,356
	Heating	0.00%		0
	Cooling	20.00%		3,051
	Base:	58.00%		
	Water Heating		6.50%	992
	Refrigeration		16.50%	2,517
	Cooking		18.50%	2,822
	Ventilation		15.00%	2,288
	Miscellaneous		1.50%	229
	Total	**100.00%**		**15,256**

TABLE III-3 (Continued)

Non-Residential Electrical Allocation
By
Major End Use and Market Segment
(FY 1993)

Market Segment	End Use	End Use %		MWh
Hotel/Motel				
	Lighting	21.00%		11,323
	Heating	6.00%		3,235
	Cooling	31.00%		16,716
	Base:	42.00%		
	Water Heating		20.00%	10,784
	Refrigeration		3.50%	1,887
	Cooking		2.50%	1,348
	Ventilation		15.00%	8,088
	Miscellaneous		1.00%	539
	Total	**100.00%**		**53,921**
Hospital				
	Lighting	16.00%		9,835
	Heating	14.00%		8,606
	Cooling	35.00%		21,514
	Base:	35.00%		
	Water Heating		6.50%	3,995
	Refrigeration		3.50%	2,151
	Cooking		3.00%	1,844
	Ventilation		20.00%	12,294
	Miscellaneous		2.00%	1,229
	Total	**100.00%**		**61,468**
Industrial				
	Lighting	15.00%		17,420
	Heating	4.00%		4,645
	Cooling	16.00%		18,581
	Base:	65.00%		
	Water Heating		3.50%	4,065
	Refrigeration		2.50%	2,903
	Cooking		1.50%	1,742
	Ventilation		17.50%	20,323
	Miscellaneous		40.00%	46,454
	Total	**100.00%**		**116,134**

TABLE III-3 (Continued)

Non-Residential Electrical Allocation
By
Major End Use and Market Segment
(FY 1993)

Market Segment	End Use	End Use %		MWh
Miscellaneous				
	Lighting	24.00%		10,504
	Heating	5.00%		2,188
	Cooling	24.00%		10,504
	Base:	47.00%		
	Water Heating		1.50%	656
	Refrigeration		1.50%	656
	Cooking		1.50%	656
	Ventilation		2.50%	1,094
	Miscellaneous		40.00%	17,506
	Total	**100.00%**		**43,765**
Office				
	Lighting	41.00%		51,394
	Heating	4.00%		5,014
	Cooling	29.00%		36,352
	Base:	26.00%		
	Water Heating		2.50%	3,134
	Refrigeration		2.50%	3,134
	Cooking		1.50%	1,880
	Ventilation		15.00%	18,803
	Miscellaneous		4.50%	5,641
	Total	**100.00%**		**125,352**
Restaurant/Bar				
	Lighting	15.00%		4,869
	Heating	2.00%		649
	Cooling	27.00%		8,765
	Base:	56.00%		
	Water Heating		10.00%	3,246
	Refrigeration		20.00%	6,492
	Cooking		10.00%	3,246
	Ventilation		15.00%	4,869
	Miscellaneous		1.00%	325
	Total	**100.00%**		**32,462**

TABLE III-3 (Continued)

Non-Residential Electrical Allocation
By
Major End Use and Market Segment
(FY 1993)

Market Segment	End Use	End Use %		MWh
Retail Outlet				
	Lighting	47.00%		43,573
	Heating	1.00%		927
	Cooling	26.00%		24,104
	Base:	26.00%		
	Water Heating		4.00%	3,708
	Refrigeration		1.50%	1,391
	Cooking		1.50%	1,391
	Ventilation		15.00%	13,906
	Miscellaneous		4.00%	3,708
	Total	**100.00%**		**92,708**
School				
	Lighting	53.00%		13,786
	Heating	4.00%		1,040
	Cooling	31.00%		8,063
	Base:	12.00%		
	Water Heating		1.50%	390
	Refrigeration		1.50%	390
	Cooking		0.75%	195
	Ventilation		7.50%	1,951
	Miscellaneous		0.75%	195
	Total	**100.00%**		**26,011**
Supermarket/Grocery				
	Lighting	17.00%		9,249
	Heating	0.00%		0
	Cooling	15.00%		8,161
	Base:	68.00%		
	Water Heating		5.00%	2,720
	Refrigeration		40.00%	21,762
	Cooking		0.75%	408
	Ventilation		15.00%	8,161
	Miscellaneous		7.25%	3,944
	Total	**100.00%**		**54,404**

TABLE III-3 (Continued)

Non-Residential Electrical Allocation
By
Major End Use and Market Segment
(FY 1993)

Market Segment	End Use	End Use %		MWh
Wharehouse				
	Lighting	55.00%		2,993
	Heating	6.00%		326
	Cooling	11.00%		599
	Base:	28.00%		
	Water Heating		0.75%	41
	Refrigeration		1.00%	54
	Cooking		0.50%	27
	Ventilation		23.25%	1,265
	Miscellaneous		2.50%	136
	Total	**100.00%**		**5,441**
All Non-Residential				
	Lighting	29.06%		187,836
	Heating	4.24%		27,407
	Cooling	25.27%		163,324
	Base:	41.43%		
	Water Heating		5.26%	34,023
	Refrigeration		6.77%	43,768
	Cooking		2.45%	15,810
	Ventilation		14.52%	93,847
	Miscellaneous		12.42%	80,294
	Total	**100.00%**		**646,309**

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IV. REFERENCES

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V. APPENDICES

A. HISTORY AND FORECAST OF ELECTRICAL CONSUMPTION PER CUSTOMER

B. SUMMARY OF RESULTS FROM ANALYSIS OF DETAILED COMMERCIAL ENERGY AUDITS USED TO CHARACTERIZE COMMERCIAL MARKET SEGMENT END USES AND APPLIANCE SATURATIONS

APPENDIX A

History and Forecast
of
Electrical Use per Customer
(kilowatt-Hours per Year)

Fiscal Year	Residential	Non-Demand	Demand	Large Power
1983	9,856	26,875	485,025	8,042,167
1984	9,698	26,441	519,557	8,063,583
1985	9,903	27,416	516,520	8,145,250
1986	10,434	28,426	507,070	8,418,692
1987	10,445	28,282	522,613	8,661,308
1988	10,416	27,832	530,019	8,310,286
1989	10,636	28,017	536,845	9,038,154
1990	10,861	28,612	543,462	8,922,786
1991	11,018	28,343	561,302	9,158,714
1992	11,328	27,218	445,342	10,568,333
1993	10,920	26,953	470,085	10,063,462
CAAGR	1.56%	0.14%	-0.94%	3.08%
1994	10,872	27,368	542,930	10,143,123
1995	11,004	27,597	545,440	10,036,721
1996	11,124	27,531	547,808	10,242,419
1997	11,150	27,330	548,403	10,291,970
1998	11,162	27,166	549,823	10,333,673
1999	11,202	27,016	551,769	10,396,253
2000	11,292	26,865	553,385	10,489,481
2001	11,381	26,763	555,933	10,590,047
2002	11,468	26,675	558,306	10,689,878
2003	11,547	26,609	561,355	10,788,884
CAAGR	0.67%	-0.31%	0.37%	0.69%

Source: 1994 Forecast of Customers, Sales and Revenues;
GRU Strategic Planning Department.

APPENDIX B
COMMERCIAL ENERGY END-USE CHARACTERIZATION STUDY

MARKET CLASS NAME	SUMMARY STATISTICS OF AUDIT SAMPLE	NUMBER OF CUSTOMERS	ENERGY US LIGHTING	COOLING	HEATING	BASE	TOTAL ENERGY
RETAIL OUTLETS(RO)							
	TOTALS	13	808,589	450,005	23,190	438,959	1,720,743
	MEAN		62,199	34,616	2,577	33,766	132,365
	STD		55,153	21,349	1,707	44,369	87,781
	MEDIAN OF TOTAL KWH		54,000	28,500	1,000	2,000	85,500
	PERCENT OF TOTAL		47%	26%	1%	26%	100%
SUPERMKT/GROCERY(SG)							
	TOTALS	4	215,346	186,403		866,470	1,268,219
	MEAN		53,837	46,601		216,618	317,055
	STD		34,736	33,387		110,556	175,504
	MEDIAN OF TOTAL KWH		38,314	27,987	3,547	35,434	93,751
	PERCENT OF TOTAL		17%	15%	0%	68%	100%
HOTEL/MOTEL(HM)							
	TOTALS	10	1,524,371	2,296,826	469,085	3,095,620	7,385,902
	MEAN		152,437	229,683	46,909	309,562	738,590
	STD		190,836	364,894	55,384	452,501	1,047,237
	MEDIAN OF TOTAL KWH			52,235	14,887	128,845	195,967
	PERCENT OF TOTAL		21%	31%	6%	42%	100%
OFFICE BUILDINGS(OF)							
	TOTALS	14	2,036,996	1,470,130	182,936	1,317,230	5,007,292
	MEAN		145,500	105,009	15,245	94,088	357,664
	STD		295,045	137,489	27,966	167,332	535,646
	MEDIAN OF TOTAL KWH		38,000	20,000	2,000	41,000	101,000
	PERCENT OF TOTAL		41%	29%	4%	26%	100%
HOSPITALS(HS)							
	TOTALS	5	328,500	739,000	304,950	748,000	2,120,450
	MEAN		82,125	147,800	76,238	149,600	424,090
	STD		90,813	181,061	75,210	191,023	440,341
	MEDIAN OF TOTAL KWH			33,000	4,525	71,905	109,430
	PERCENT OF TOTAL		15%	35%	14%	35%	100%
RESTAURANTS/BARS(RB)							
	TOTALS	11	434,583	783,768	64,206	1,626,214	2,908,771
	MEAN		39,508	71,252	7,134	147,838	264,434
	STD		37,214	78,582	7,359	105,448	219,240
	MEDIAN OF TOTAL KWH		31,500	69,000	4,500	155,000	260,000
	PERCENT OF TOTAL		15%	27%	2%	56%	100%
FAST FOODS							
	TOTALS	5	209,544	188,400	4,270	554,816	957,030
	MEAN		41,909	37,680	2,135	110,963	191,406
	STD		26,377	17,284	1,135	86,173	118,095
	MEDIAN OF TOTAL KWH		82,000	31,000		115,000	228,000
	PERCENT OF TOTAL		22%	20%	0%	58%	100%

APPENDIX B (CONTINUED)
COMMERCIAL ENERGY END-USE CHARACTERIZATION STUDY

MARKET CLASS NAME	SUMMARY STATISTICS OF AUDIT SAMPLE	NUMBER OF CUSTOMERS	ENERGY US LIGHTING	COOLING	HEATING	BASE	TOTAL ENERGY
CHURCH/AUDITORIUM							
	TOTALS	8	334,835	321,068	33,812	74,775	764,490
	MEAN		41,854	40,134	4,227	9,347	95,561
	STD		39,683	45,303	3,509	7,315	85,698
	MEDIAN OF TOTAL KWH		35,500	13,000	4,000	4,625	57,125
	PERCENT OF TOTAL		44%	42%	4%	10%	100%
WAREHOUSE							
	TOTALS	3	323,500	64,000	37,500	167,500	592,500
	MEAN		107,833	21,333	12,500	55,833	197,500
	STD		116,795	22,395	10,304	72,973	221,793
	MEDIAN OF TOTAL KWH		26,500	6,000	10,500	6,500	49,500
	PERCENT OF TOTAL		55%	11%	6%	28%	100%
INDUSTRIAL							
	TOTALS	13	1,819,625	1,870,378	456,155	7,586,159	11,732,317
	MEAN		139,971	143,875	45,616	583,551	902,486
	STD		192,549	196,179	108,783	1,672,833	2,130,412
	MEDIAN OF TOTAL KWH		126,000	285,500	35,500	22,000	469,000
	PERCENT OF TOTAL		16%	16%	4%	65%	100%
SCHOOLS							
	TOTALS	5	218,870	126,605	15,926	50,822	412,223
	MEAN		43,774	25,321	3,185	10,164	82,445
	STD		45,834	20,078	5,414	10,420	78,041
	MEDIAN OF TOTAL KWH		13,312	14,782	387	4,573	33,054
	PERCENT OF TOTAL		53%	31%	4%	12%	100%
ALL CLASSES COMB	TOTAL SAMPLE ENERGY		8,254,759	8,496,583	1,592,030	16,526,565	34,869,937
	PERCENT OF TOTAL		24%	24%	5%	47%	100%

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