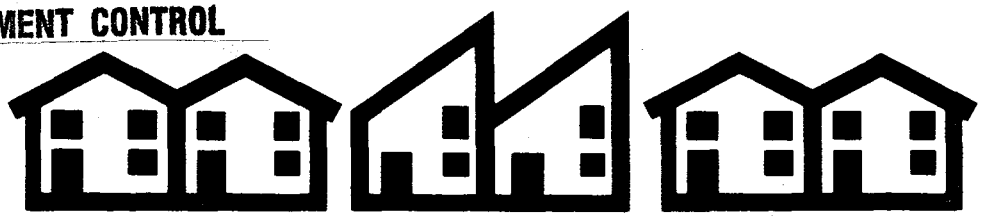

1981 RESIDENTIAL ENERGY SURVEY (MIRACLE V)

San Diego Gas & Electric

Policy & Communication Research Department
August 1982

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1981

RESIDENTIAL ENERGY

SURVEY

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SAN DIEGO GAS & ELECTRIC

1981 Residential Appliance Saturation Survey

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CHAPTER 1

EXECUTIVE SUMMARY

Introduction

Under the California Energy Commission's (CEC's) Common Forecasting Methodology (CFM) forms and instructions, utility companies are required to conduct surveys in the residential sector on a biennial basis. Information on residential appliances, demographic characteristics and related patterns of electricity and natural gas consumption are gathered from the survey. It is then incorporated into forecasts of future residential electricity and natural gas demand, and used to plan effective conservation and load management programs.

The 1981 Residential Energy Survey (or, as it is also called: Marketing Information Retrieval and Customer Load Estimates (MIRACLE)) was sent to 15,000 individually-metered and master-metered residential customers in the SDG&E service territory.

This report presents residential customer responses to the 1981 Residential Energy Survey, and has been organized so that this chapter presents a synopsis of the survey procedure and system level saturations. Chapter 2 discusses the major findings presented in tabular form in Chapters 4-11. Chapter 3 contains graphic representations of historical trends in major gas and electric appliances. Details of the survey procedure are located in Chapter 12, while the Appendix contains the cover letter and questionnaire sent to each residential customer in the

sample.

Survey Procedure

The 1981 study is the fifth biennial appliance survey conducted by SDG&E. Data for this survey was collected from September thru November 1981 in a two phase survey design. Based on a sample design done by the CEC, 15,000 residential customers were selected at random from the Customer Master File. All sampled respondents who did not respond to the initial mail attempt were mailed a second questionnaire three weeks later. Subsequently, a 10 percent sample of non-respondents to either of the mail survey attempts was drawn for follow-up telephone or personal interviews. The overall response rate was 54% or 8,037 completed usable questionnaires.

With this sample size, there is 95 percent certainty that saturation estimates close to the 50% level are accurate within ± 1.2 percentage points. For example, it is 95% certain that the true saturation of dishwashers is 55.4 percent ±1.2 percentage points or within the range 54.2 to 56.6 percent. For saturations closer to either 10 percent or 90 percent, the confidence interval is even smaller, ±0.69 percentage points.

1981 System Saturations

Dwelling Characteristics

Approximately six of ten dwelling units in the SDG&E service territory are single family. This number has decreased slightly since 1979, and a possible explanaton for this is the inclusion of master-metered customers in the MIRACLE V sample. Previous MIRACLE surveys sampled individually-metered customers only, thus eliminating a large number of multi-family dwellings and mobile homes. Townhouses which have become more popular in the past 10 years are occupied by about 8.3% of the residential base, while low-rise (1-3 stories) apartments or condominimums make up 19.4% of the base.

On a total sample basis, nearly 67% of residential customers own their dwelling units (this is down from MIRACLE IV due to sampling technique as explained above). The percentage ownership, of course, varies widely by dwelling type.

The median age of a dwelling unit in the service territory is approximately 15.5 years. This number is lower for the northern area of the service territory due to the boom in housing during the 1970's (one-third of the homes in this area were built after 1970). Due to escalating home prices and interest rates since 1979, the number of homes in the service territory less than two years old has decreased sharply to 2.9%, compared to 7.1% in 1979.

The number of bedrooms and resulting square footage is largely a function of the dwelling type. New single family homes are the largest while apartments in general are smallest. Clearly, residents of new

single family homes are the most affluent and residents of apartments the least affluent. Mobile homes tend to parallel apartments both in size and in the demographic composition of their residents.

Insulation for ceilings and walls appears to be dramatically different by dwelling type. New single family homes are the most likely to report having R-19 or greater ceiling insulation (this was mandated for new home construction in 1975). However, knowledge about the presence of insulation does vary widely, but has improved since MIRACLE IV. For example, nearly 70% of apartment or condominium dwellers said they did not know whether their building was insulated, as compared to 84% in 1979. Even among new single family dwellers, most of whom are homeowners, a lack of information was discovered. Consequently it is still very difficult to make meaningful comparisons on this variable.

Household Characteristics

The number of residents per household is closely related to the size and type of dwelling unit. As might be expected, the majority of families in single family dwellings consist of three or more members. By contrast 39.8% of all apartments or condominiums are occupied by a single individual. The most predominant age categories for these apartment dwellers are 25-34 and 19-24. Mobile homes, on the other hand, attract older residents. In fact, over 68% of mobile home occupants are at least 55 years of age. Unlike apartments, though, less than one-third are occupied by one person living alone.

Educational and income demographics also tend to be correlated with dwelling type. Residents of new single family homes have the most education (82% completing at least some college courses) and the highest

annual family incomes. Since income was obtained through group categories it is not possible to calculate an exact mean. However, assuming that every observation in a class has a value equal to the class midpoint and that the midpoint of the upper unbounded class is $60,000, a rough approximation of the mean can be made. These calculations reveal that new single family households have an average income of approximately $38,628 per year. This is up $14,328 from 1979. Per capita this amounts to roughly $12,665. By contrast the household and per capita incomes for apartment/condominium dwellers are $16,938 and $8,785, respectively, while townhouse dwellers were somewhat higher with average incomes of $24,022 per year and per capita incomes of $9,797.

Heating and Cooling Systems

The primary fuel used for space heating in the SDG&E service territory is natural gas. Of the 77.1% using natural gas, more than one-half have forced air systems. By dwelling type, single family homes, duplex-triplex units and mobile homes are most likely to use gas.

More than 20% of the dwelling units claim use of a fireplace for additional heating. This number greatly exceeds any other type of additional heating mentioned.

Slightly more than 25% of the dwellings in the SDG&E service territory have air conditioning. This saturation level varies widely by type of residence with the range from a low of 13.8% among duplexes to a high of 60.1% among mobile homes. New single family homes, townhouses, and mobile homes are the most likely to have electric central systems, while the majority of apartments/condos have window, wall units.

Appliance Saturations

Appliance saturations generally vary as a function of dwelling type, number of residents, income and composition of the family unit. New single family homes tend to have the greatest number and variety of appliances, while duplex-triplex have the least.

Ownership trends over time are pictorially represented in Chapter 3. In a capsulized form, the following appliances have shown relatively substantial growth rates in the past 5-10 years.

Microwave Ovens	(up 373% since 1975)
Dishwashers	(up 60% since 1971 although down 4% since 1979)
Color Televisions	(up 48% since 1971)

Those appliances which have declined in the past few years include:

Black & White Televisions	(down 42% since 1975)
Ownership of Multiple Refrigerators	(down 63% since 1979)
Frost-free Freezers	(down 35% since 1971)

Some appliance saturations have changed significantly only in the past two years, such as ownership of multiple refrigerators and dishwashers (mentioned above). Others include:

Electric Ranges	(although up since 1971, has remained constant since 1975)
Frost-free refrigerator	(although up 24% in 1979, has decreased 4% since then)
Clothes Dryers in Home	(although up 11% in 1979 over 1975, has decreased 7% since 1979)

Again, an explanation for the decrease in some saturations since 1979 is the inclusion of master-metered customers in the 1981 sample. Another possible explanation for the decrease since 1979 is the rising cost of energy forcing people to unplug their second refrigerator or separate freezer. Other appliance saturations have remained more or less constant.

TABLE 1.0

SDG&E SYSTEM SATURATIONS:

Home Information
(Percent)

Dwelling Type	
Single Family	59.8
Townhouse or Row House	8.3
Duplex-Triplex	6.5
Low-Rise Apt. or Condominium	19.4
High-Rise Apt. or Condominium	0.8
Mobile Home	5.2
Home Ownership	
Own	66.7
Rent/Lease	32.6
Other	0.7
Year Home Was Built	
1980 or Later	2.9
1979	4.6
1975-1978	14.2
1970-1974	17.7
1960-1969	19.4
1950-1959	15.9
1940-1949	6.0
Before 1940	6.3
Don't Know	13.1
Number of Bedrooms	
Studio	1.1
One	12.6
Two	34.6
Three	34.3
Four	14.9
Five	2.1
Six or More	0.4
Square Footage	
Less than 300 Sq. Feet	1.1
300-499 Sq. Feet	2.5
500-799 Sq. Feet	6.2
800-1099 Sq. Feet	12.3
1100-1299 Sq. Feet	11.3
1300-1599 Sq. Feet	14.6
1600-1999 Sq. Feet	13.8
2000-2399 Sq. Feet	6.8
2400-2999 Sq. Feet	4.6
3000 Sq. Feet or More	2.3
Don't Know	24.6

Ceiling Insulation	
None	20.5
Less than R-11	1.5
R-11 thru R-18	7.2
R-19 or Greater	38.7
Don't Know	32.1
Wall Insulation	
Yes	32.5
No	25.9
Not Sure	41.6

SDG&E SYSTEM SATURATIONS:

Household Information
(Percent)

Number of Residents	
One	19.6
Two	38.7
Three or Four	31.5
Five or Six	8.6
Seven or Eight	1.2
Nine or More	0.4
Residents in Specific Age Groups	
5 or Under	5.2
6-9	4.7
10-14	5.0
15-18	4.2
19-24	7.9
25-34	14.8
35-44	14.4
45-54	11.3
55-64	11.6
65+	21.1
Residents Age 5 or Under	
None	84.8
One	10.4
Two	4.1
Three	0.5
Four	0.1
Five to Nine	0.0
Residents Age 6-9	
None	88.8
One	9.2
Two	1.9
Three	0.1
Four	0.0
Five to Nine	0.0
Residents Age 10-14	
None	86.7
One	9.3
Two	3.4
Three	0.5
Four	0.1
Five to Nine	0.0

Residents Age 15-18	
None	87.9
One	8.8
Two	2.7
Three	0.6
Four	0.1
Five to Nine	0.0
Residents Age 19-24	
None	80.9
One	12.5
Two	5.6
Three	0.7
Four	0.2
Five to Nine	0.1
Residents Age 25-34	
None	68.1
One	17.0
Two	14.2
Three	0.5
Four	0.1
Five to Nine	0.0
Residents Age 35-44	
None	76.4
One	14.3
Two	9.2
Three	0.0
Four	0.0
Five to Nine	0.0
Residents Age 45-54	
None	80.7
One	11.5
Two	7.7
Three	0.0
Four	0.0
Five to Nine	0.0
Residents Age 55-64	
None	79.0
One	12.5
Two	8.3
Three	0.0
Four	0.0
Five to Nine	0.0

Residents Age 65 or Older	
None	76.4
One	14.3
Two	9.1
Three	0.2
Four	0.0
Five to Nine	0.0
Educational Background Head of Household	
Elementary School	3.3
Some High School	6.4
High School Grad	19.5
Trade or Technical School	5.3
Some College	21.4
2 Year College Grad	10.3
4 Year College Grad or above	33.7
Total Annual Household Income	
Less than $2,499	2.2
$2,500-$4,999	4.2
$5,000-$7,499	6.6
$7,500-$9,999	6.4
$10,000-$12,499	9.0
$12,500-$14,999	6.9
$15,000-$19,999	12.9
$20,000-$24,999	13.4
$25,000-$29,999	9.7
$30,000-$34,999	8.6
$35,000-$39,999	5.7
$40,000-$44,999	4.1
$45,000-$49,999	2.4
$50,000 or more	8.0

SDG&E SYSTEM SATURATIONS:

Space Conditioning
(Percent)

Space Heating Fuel	
Electricity	17.5
Natural Gas	77.1
Bottled Gas	2.1
Solar System	0.1
Other	1.5
Don't Know	1.5
Space Heating System	
Electric Forced Air	2.8
Electric Floor, Ceiling	12.2
Electric Heat Pump	1.7
Gas Forced Air	42.4
Gas Wall, Floor	31.7
Other	3.3
None	3.9
Don't Know	0.0
Additional Electric Heaters	
None	57.2
One	36.1
Two	5.4
Three or More	1.3
Air Conditioning System	
Electric Central	10.3
Window, Wall	11.3
Heat Pump	1.4
Evaporative	2.0
Gas Central	1.6
None	72.7
Don't Know	0.6

SDG&E SYSTEM SATURATIONS:

Appliances	(Percent)
Television	
None	1.8
Black and White Only	9.8
Color Only	69.5
Both	18.9
Number of Black and White Televisions	
One	25.8
Two	2.5
Three	0.3
Four	0.0
Total**	31.7
Number of Color Televisions	
One	67.5
Two	18.5
Three	2.2
Four	0.2
Total**	111.9
Type of Cooking Range	
None	0.6
Electric	48.6
Natural Gas	47.6
Bottled Gas	1.4
Other	1.7
Microwave Oven	34.5
Type of Refrigerator	
None	2.5
Manual Defrost	23.2
Frost-Free	67.5
Both Manual and Frost-Free	6.8
Number of Frost-Free Refrigerators	
One	69.8
Two	4.8
Three or More	0.2
Total**	80.0

* Trend data pictorially presented in Chapter 3.

** Number of Appliances Per 100 Customers.

Type of Freezer	
Upright Manual Defrost	11.8
Upright - Manual Frost-Free	6.6
Chest	5.6
Dishwasher	55.4
Washing Machine	
Private Use	68.9
Multi-Residence Use	20.9
Type of Clothes Dryer	
Electric-Private Use	37.7
Natural Gas-Private Use	35.8
Bottled Gas-Private Use	0.8
Central Location	24.7
Don't Know	0.9
Type of Water Heater	
Electric	9.5
Natural Gas	66.6
Bottled Gas	1.7
Solar System	3.4
Central Location	16.8
Don't Know	1.8
Swimming Pool	
Private Use	8.5
Multi-Residence Use	19.6
Swimming Pool Heaters (Among Swimming Pool Owners)	
None	39.5
Natural Gas	23.2
Solar Heat	19.4
Other	6.1
Don't Know	5.5
Pool Cover	7.9
Jacuzzi*	17.5

* Includes Central Use Facilities

CHAPTER 2

MAJOR FINDINGS

Introduction

Residential appliance saturations and energy end-use are greatly affected by certain demographic and lifestyle variables. For example, single family homes consume more energy than apartments, large families use more than small families, and so forth. This chapter presents an analysis of energy end-use for mutually exclusive groups of customers. Eight separate segmenting dimensions were considered: type of dwelling unit, owner vs. renter, size of household, family income level, composition of family unit, geographic area, SDG&E service center and kilowatt hour consumption. Each of these will be discussed in the following sections in a summary form. For more detailed data, reference should be made to Chapters 4-11.

I. DWELLING TYPE

For the purpose of analyzing residential energy end-use, dwelling units were split into six catagories: single family, new single family (less than 2 years old), duplex-triplex, townhouse, apartment or condominium, and mobile home. Average monthly consumption by dwelling type is presented in Table 2.1.

TABLE 2.1

Average Monthly Consumption
by Type of Dwelling Unit

Dwelling Unit	Kwhrs	Therms
Single Family	517	48
New Single Family (less than 2 yrs.)	580	39
Duplex-Triplex	300	34
Townhouse	429	36
Apartment or Condominium	285	22
Mobile Home	389	45

New single family homes are the largest users of electricity. However, these homes are significantly larger and have higher levels of appliance ownership. Consequently it might be expected that these dwellings would use even more energy than they actually do. Undoubtedly the presence of insulation and, to a lesser extent, energy efficient appliances in these dwellings reduces energy consumption levels.

As seen in Table 2.2, established adults and established families make up over one-half of new single family homeowners. This differs greatly from MIRACLE IV, in that fewer young families are purchasing new single family homes. This is due, in a large part, to rising housing prices and escalating interest rates over the past two years. Established adults and established families tend to have more equity built up in previous homes.

Younger homeowners have lower levels of energy use as can be seen in Table 2.3. This implies two things: 1) younger families are smaller in size than established families, thus using less energy, and 2) these young homeowners are spending a large portion of their income on such things as the mortgage while deferring the purchase of electricity-consuming appliances.

TABLE 2.2

Family Distribution for New Homes
Base = Single Family Owners

Family Type*	Percentage
Young Adults	4.0
Young Families	9.1
Established Adults	39.4
Established Families	20.6
Seniors	9.1
Unclassified	17.7

*For a complete description of categories see page 37.

TABLE 2.3

Average Monthly Consumption
New Single Family Owners

Family Type	Kwhr	Therms
Young Adults Young Families	464	37
Established Adults Established Families	593	39

While some dwelling types such as townhouses and apartments or condominiums appear to be similar, their patterns of consumption are really quite different. Not only is there a difference in the dwelling types themselves, but the composition of the occupants varies widely. This is seen most clearly in Table 2.4. These figures show, for example, that 28% of single family dwellers are established families with children, while 54.6% of mobile home dwellers are senior citizens. Thus in examining usage pattern by dwelling type it is important to relate these back to the composition of the family group occupying the dwelling.

A. Single Family Dwellings

The major distinguishing characteristic of single family homes is the presence of children. Over 43% of all single family home dwellers have at least one child under the age of 18. The vast majority (85.2%) of these homes are owner-occupied and 73.4% have three or more bedrooms.

As most single family homes in the service territory were built ten or more years ago, it is not surprising to discover that natural gas is the primary fuel used for space and water heating. Cooking ranges, however, are nearly equally divided between electric and natural gas models (since this appliance is more likely to be retrofitted than is a central heating system).

TABLE 2.4

Composition of Family Unit
by Type of Dwelling

	Single Family	New Single Family	Duplex-Triplex	Town-house	Apt. or Condo	Mobile Home	Total Sample
Young Adults	1.1%	0.8%	3.6%	4.5%	10.1%	0.5%	3.3%
Young Families	11.9	13.5	19.3	11.9	11.6	3.4	11.9
Established Adults	27.1	31.0	31.5	36.7	37.0	24.0	30.1
Established Families	28.0	24.6	9.6	16.6	7.1	4.1	20.3
Seniors	15.9	8.7	20.8	14.5	19.3	54.6	18.8
Unclassified	15.8	21.4	15.1	15.7	14.8	13.5	15.5
Children in Household	43.3%	46.8%	30.4%	29.6%	18.6%	9.4%	34.6%

The market for many appliances is well saturated within the single family segment. For example, 92.3% own at least one color television, 85% own a frost-free refrigerator, and 43.2% have a microwave oven (up from 35% in 1979).

Similarly, the saturation is high for washing machines and dryers. Over 90% of these units have a washing machine, while 80% own a dryer, half of which are electric. This saturation level for both washers and dryers has remained constant over the past few years.

B. New Single Family Homes

The occupants of new single family homes appear to be divided into two distinct categories: 1) established families and 2) established adults. Young families, while still comprising a viable market segment, account for less than 14% of the family units in the new home category. This number has remained constant over the past few years. Thus, while young families may be constrained by budgeting limitations which may lower the overall consumption level for the category, the effect is not pronounced. By contrast established families comprise nearly 25% of the sample. These are heavy users with average monthly consumption of 611 kwhrs and 53 therms.

Demographically, residents of newer homes tend to be upscale, with over two-thirds having total annual family incomes exceeding $30,000 per year. With income at this level it is not surprising to discover that the vast majority (92%) own their homes. Over half of the heads-of-household have at least one four-year college degree, and another 25% have completed some college or a two-year college degree.

Physically these homes are also above average both in size and in possession of selected appliances. Almost half have four bedrooms or more and a nearly equal number contain more than 2,000 square feet. Approximately three-fourths own a microwave oven, while 23.8% have a jacuzzi (up from 60% and 20% respectively in 1979).

As might be expected, a higher percentage (69.1%) have natural gas space heating and nearly three in four have electric cooking ranges. While most of these homes have gas water heaters, the incidence of solar water heaters (15.3%) has grown significantly over the past few years. This higher incidence can be attributed to a San Diego County building code which requires that solar water heating be installed in new homes. This will also affect new single family dwellers' overall consumption levels.

C. Duplex-Triplex/Townhouse/Apartment or Condominium

It was initially thought that duplex-triplexes*, townhouses, and apartments/condominiums would be somewhat similar in their energy-use profiles. But in looking at their average monthly consumption they differ substantially. Duplexes and apartments/condos have fairly

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*hereinafter referred to as "duplexes".

similar levels of average monthly consumption (300 kwhrs/34 therms and 284 kwhrs/21 therms respectively). However, townhouses differ the most, using an average of 429 kilowatt hours and 36 therms monthly and is due mainly to differences in dwelling characteristics.

Approximately two-thirds of all townhouses are owner-occupied, compared to only 16.3% for apartments/condos and 33.5% for duplexes. These owner-occupied duplexes are undoubtedly smaller buildings where the owner lives in one of the units.

Both duplexes and apartments/condos tend to be rather small, occupying less than 1100 square feet, and to have only one or two bedrooms. Consequently most are occupied by one or two people. Conversely, townhouses are somewhat larger, ranging in size from 800-2000 square feet, and having two or three bedrooms. Townhouses also tend to be newer than duplexes or apartments/condos.

It was not surprising to discover that the total annual household income for residents of duplexes and apartments/condos is less than for single family homes. However, townhouse residents tend to be more upscale demographically than residents of duplexes and apartments/condos, having above average household incomes and almost half having a college degree. In all three dwelling types, the majority have at least a high school diploma, while significantly more than half have some college training.

The greatest difference between duplexes, townhouses and apartments/condos occurs with respect to the fuel used for space heating. Slightly more than 52% of apartments/condos are heated by electricity, with the most popular system being floor or ceiling units. Duplexes, on the other hand, are primarily heated by natural gas wall and floor units.

Townhouses are also mainly heated with natural gas, which includes central forced air and wall-floor units. Twenty percent of townhouses also have electric floor or ceiling units.

Apartments/condos are more likely to have electric window, wall air conditioning units as well as electric central. The majority of townhouses have electric central air conditioning, while duplexes generally had no type of air conditioning at all (86%).

Of the three dwelling types, townhouses had the highest saturation of color televisions (110 per 100 customers), microwave ovens (31.6%), frost-free refrigerators (72.9%) and dishwashers (65.7%). Duplexes were more likely to have natural gas ranges, while townhouses and apartments/condos had a higher saturation of electric ranges.

D. Mobile Homes

Almost one-half of all mobile homes are occupied by senior citizens. This is a big jump from 1979, but again it can be atributed to the inclusion of master-metered dwellings in the sample, which would include more mobile home parks in which senior citizens reside. The vast majority (96.7%) own their units. On the average the mobile homes in the sample have two bedrooms and are 500-1600 square feet.

Natural gas is used for space heating by nearly 90% of mobile home occupants with forced air systems being the most common. Natural gas is also used by 78.7% for cooking and 86.4% for water heating.

Surprisingly, mobile homes have the highest incidence of air conditioning. Sixty percent have some type of system, the majority of which are either electric central or evaporative units.

Nearly nine out of ten mobile home occupants either own a washer and dryer or have access to a set through central-use facilities. Over one-third of these are common-use appliances. As with condominium residents, mobile home dwellers are also likely to have swimming pools and jacuzzis available for use (65.2% and 39.0%, respectively).

II. OWNER/RENTER SEGMENTS

Over 85% of single family homes are owner-occupied. This figure increases to 92% for new homes and 96.7% for all mobile homes, regardless of age. As might be expected the owner segment is considerably smaller among duplex-triplex and apartment/condominium dwellings (33.5% and 46.3%, respectively). Townhouses fall in the middle with 60.7% owning their dwelling.

As Table 2.5 illustrates, owners of single family dwellings have the highest average consumption levels, significantly above that of single family renters. No other segments parallel single family owners in their consumption patterns. Single family renters, townhouse renters, and apartment/condo owners tend to be more parallel in their energy use patterns.

In general, rented single family homes tend to be older, smaller and less well insulated than owner occupied homes. The occupants of these dwelling units likewise tend to be younger and have lower annual household incomes -- $18,384 compared to $22,244 for single family owners.

TABLE 2.5

Average Monthly Consumption
by Type of Dwelling Unit
by Owner/Renter Segments

Dwelling Unit	Kwhrs	Therms
Single Family		
Owners	540	49
Renters	368	43
Townhouse		
Owners	472	38
Renters	346	32
Apartment/Condominium		
Owners	389	30
Renters	260	20

The vast majority of single family homes are heated by natural gas and, in fact, there is no difference between owners and renters on this variable. The heating system, however, does tend to vary; owners being more likely to have forced air systems and renters more likely to have wall or floor furnaces. Electric space heating systems while not particularly popular in the single family market are found more often in multi-family dwellings.

As might be expected from the demographic characteristics of the residents, single family renters tend to own fewer appliances than single family owners. This is particularly true for appliances such as color televisions, microwave ovens, freezers, and dishwashers which could be termed luxury items. Similarly, single family owners are much more likely to own both a washing machine and a dryer.

Multi-family owners tend to parallel single family owners in ownership of most of the major appliances. However, a higher percentage of multi-family owners have electric ranges and electric space heating.

Finally, multi-family renters own the fewest appliances of any segment. For example, less than 15% own a microwave oven, freezer, washing machine or dryer. However, the majority of multi-family renters do have access to the latter two appliances through central-use facilities.

III. HOUSEHOLD SIZE

Obviously, the relationship between consumption and household size is not a linear one. Table 2.6 shows the average monthly consumption for various household sizes. A single person household might be considered a base load, subject of course, to different lifestyle dimensions. The following will examine the effect of additional household members upon appliance saturations. In particular, one-person households will be compared to those with five or more members.

As might be expected, over 92% of households with five or more members occupy a single family dwelling while one-person households are significantly more likely to live in some type of multi-family structure. These multi-family homes tend to be older and, of course, much smaller than those occupied by larger families.

Since almost two-thirds of the one-person households reside in an apartment or condominium, it was not surprising to discover that almost one-fourth have electric space heating with floor or ceiling units being the most common. Understandably larger families who live in single family homes tend to have gas space heating.

The average income for a one-person household is approximately $13,000. By contrast households with five or more members earn almost $27,000 per year. Since it is impossible to determine how many wage earners are present in these larger households, direct comparisons cannot be made. However, an examination of the age categories reveals that nearly half of the one-person households are comprised of an adult over the age of 55. The adults in the larger households are considerably

TABLE 2.6

Average Monthly Consumption
by Household Size

Household Size	Kwhrs	Therms
One	261	32
Two	418	40
Three or Four	542	49
Five or More	641	56

younger and would presumably have greater earning power. This has not changed at all since 1979.

Higher incomes and larger family sizes are closely correlated with appliance ownership. For example, almost 40% of families with five or more members own a freezer, one-third of which are frost-free. These families are also much more likely to own microwave ovens, dishwashers, washing machines, clothes dryers, and more than one refrigerator. Only swimming pools and jacuzzis are found more often among single-person households and this, of course, is due to the higher incidence of apartment dwellers.

IV. INCOME

The average total annual household income in the service territory is approximately $23,093. To examine the income effect upon appliance saturations, two separate groups were considered: those earning less than $12,500 (28.4% of the population) and those earning more than $40,000 per year (14.5% of the population). Table 2.7 presents the average monthly consumption for these two groups. The net difference in energy usage is over 374 Kwhrs and 22 therms monthly.

Customers earning more than $40,000 per year tend to own relatively new, large, single family dwellings. Almost half of these homes have more than 2,000 square feet and as they are newer, the majority are well insulated.

In contrast, less than two-thirds of those customers earning less than $12,500 per year live in a single family home. The homes occupied by this group tend to be older, significantly smaller, and not as well insulated.

While both groups of customers tend to have gas space heating, primarily those earning less than $12,500 are more likely to have wall or floor units, while those with incomes above $40,000 tend to have forced air systems. This latter group is also more likely to have some type of air conditioning system.

TABLE 2.7

Average Monthly Consumption
by Income

Income	Kwhrs	Therms
Less than $12,500	299	36
$40,000 or more	673	58

The greater purchasing power of the more affluent customers is particularly obvious in the appliance saturation figures. For example, these customers own nearly twice the number of color televisions, frost-free refrigerators and freezers. Well over half of them have a microwave oven and almost 90% have a dishwasher. Additionally, one out of four families with incomes over $40,000 has a private swimming pool and nearly 30% have the use of a jacuzzi. These comparisons between income have not changed significantly between MIRACLE IV and V, however, the average income did go up.

V. FAMILY TYPE

It was hypothesized that energy end-use might be greatly affected by the structure of the household unit. Consequently five categories were defined as follows:

Young adults	-	Adults 19-24 No children
Young families	-	Adults 19-34 Children 0-18
Established adults	-	Adults 25-64 No children
Established families	-	Adults 35-64 Children 0-18
Senior Citizens	-	Adults 65 + No Children

These classifications accounted for over 80% of the sample; the remainder were considered too heterogeneous to be placed in a group. Table 2.8 illustrates the average monthly consumption for each of these five groups. As might be expected, established families have the highest average monthly consumption, 184 Kwhrs and 11 therms above any other group.

The vast majority of established families live in large single family dwellings which they own. While young families also tend to ocupy single family homes, these units are generally smaller (three or fewer bedrooms) and more frequently rented. Not surprisingly, over half of all young adults reside in an apartment or condominium.

TABLE 2.8

Average Monthly Consumption
by Family Type

Family Type	Kwhrs	Therms
Young Adults	265	25
Young Families	427	42
Established Adults	396	38
Established Families	611	53
Senior Citizens	370	40

On a system-wide basis, approximately one in five individually metered residences is heated by electricity. Since young adults tend to occupy apartments, the saturation of electric space heating is much higher among this group.

As with other segmenting dimensions previously considered, appliance ownership levels are highly dependent upon the economic characteristics of the household. Consequently, established families own more appliances than any other group. For example, 48.3% own a microwave oven, 38.5% own a freezer, and 70.2% have a dishwasher. At the other end of the spectrum young adults own the fewest appliances, with 16.5% owning a microwave oven, and 44% having a dishwasher. Finally, while senior citizens may have less disposable income, the market for appliances such as televisions, frost-free refrigerators and washing machines is fairly well saturated.

VI. GEOGRAPHIC AREA (CLIMATE ZONE)

Geographic area is also thought to greatly impact energy end use. The closer a person lives to the ocean, the more mild the temperature. Further inland greater fluctuations occur between cold and hot temperatures. Geographic climate zones were classified by SDG&E defined areas. Table 2.9 illustrates the average monthly consumption for each climate zone. As might be expected, the inland zone had the highest average monthly consumption, 564 kwhrs and 47 therms.

There are significant differences in dwelling characteristics between the climate zones, especially the maritime and inland zones. Homes in the inland area are newer (less than 10 years old) then the maritime zone, 45.6% versus 19.2%, and tend to be larger, with more square footage and bedrooms.

Appliance ownership also differs between the two zones. Those customers who live in the inland zone own more color televisions, microwave ovens, freezers, and dishwashers.

The coastal zone falls in-between the maritime and inland zones in all ownership levels of appliances. In demographic characteristics residents in the coastal zone more closely resemble those in the inland zone.

TABLE 2.9

Average Monthly Consumption
by Climate Zone

Climate Zone	Kwhrs	Therms
Maritime	359	41
Coastal	453	45
Inland	564	47

VII. SDG&E SERVICE CENTER

Another way to look at differences in energy end-use is to categorize customers into SDG&E's Service Centers. Table 2.10 presents the average monthly consumption for each service center. As might be expected, the Eastern and Northeast service centers have higher electric consumption due to more extreme differences in temperature during the year, and as a result, higher saturations of air conditioning (55.4% and 48.8% respectively).

It was not surprising to find that newer, larger homes are found in the North Coast, Northeast and Orange County service centers, since these are the fastest growing areas in San Diego County. These three service centers also stand out in home ownership and incidence of wall and ceiling insulation, which correlates directly with the number of new homes.

Income differences stand out significantly in the service centers. Over one-half of all customers in Orange County have incomes greater than $30,000 per year. Again, this correlates to the newer, larger homes.

Centre City service center has the lowest incomes, with almost 50% earning less than $12,500 per year. This is not a surprising fact since the Centre City service center covers downtown, southeast San Diego and North Park, which are known as lower income areas.

Appliance ownership patterns tend to follow in line with dwelling characteristics and income. North Coast, Northeast and Orange County tend to lead the way in appliance ownership of such items as frost-free refrigerators, dishwashers and jacuzzis.

TABLE 2.10

Average Monthly Consumption
by SDG&E Service Center

Service Center	Kwhrs	Therms
Beach Cities	441	46
Centre City	316	37
Eastern	521	45
North Coast	503	46
Northeast	580	46
Orange County	428	NA
South Bay	406	42

VIII. CONSUMPTION LEVELS

Consumption levels can really give a good picture of appliance ownership and dwelling characteristics. The consumption levels used in Chapter 11 tables were put together by the CEC and defined as follows: 1) low consumption - 0 to 400 kwhrs average monthly electric consumption, 2) medium consumption - 401 to 700 kwhrs, and 3) high consumption - 701 or more kwhrs.

As expected, those dwellings with high consumption tend to be single family, larger homes with residents having somewhat higher incomes (55.6% earning $40,000 or more annually). It is interesting to note that the amount of ceiling insulation is the same for all three levels of consumption.

The vast majority of homes in all three consumption categories are heated by natural gas. The heating system, however, does tend to vary slightly, with high consumption dwellings being more likely to have gas forced air systems.

As stated before, high consumption is closely correlated with appliance ownership. For example, one in five high consumption households have electric central air conditioning. These households are also much more likely to own color televisions, microwave ovens, frost-free freezers, dishwashers, swimming pools and jacuzzis. All of which contribute to the higher levels of consumption.

IX. CONSERVATION ITEMS INSTALLED

For the first time, the MIRACLE V survey questioned customers about conservation items installed in the home. Table 2.11 depicts the percentage of responses to twelve conservation items listed in the questionnaire. As might be expected, the highest percentage of responses was for lower priced conservation items, such as water heater blankets, showerhead flow restrictors, caulking or weatherstripping, and replacement of light bulbs with lower wattage bulbs.

No direct comparisons can be made against other surveys on conservation items installed, because of different wording of the questions or different sample groups. The intention, however, is to continue with this questioning in future MIRACLE surveys so as to provide for a common base in trending and for tying in these data with other unique MIRACLE information.

TABLE 2.11

Conservation Items Installed In Home

	Never Done	Installed Since Moved In	Installed Before Moved In
Added Ceiling Insulation	58.4%	22.0%	19.6%
Installed a Water Heater Blanket	71.8	26.1	2.0
Installed a Clock Thermostat	89.9	5.2	4.8
Installed Showerhead Flow Restrictor	59.4	35.4	5.2
Replaced Light Bulbs with Lower Wattage Bulbs	30.3	67.5	2.2
Put in Caulking/Weatherstripping around Windows/Doors	62.2	29.3	8.5
Put Insulation around Water Pipes/Air Ducts	82.8	10.4	6.8
Installed Swimming Pool Cover	91.7	6.9	1.4
Added Wall Insulation	80.6	9.2	10.2
Added Attic Turbine Ventilator	85.7	12.0	2.3
Added Window Film or Glazing	84.9	13.2	1.9
Added External Shading to Windows	78.6	17.6	3.8

CHAPTER 3

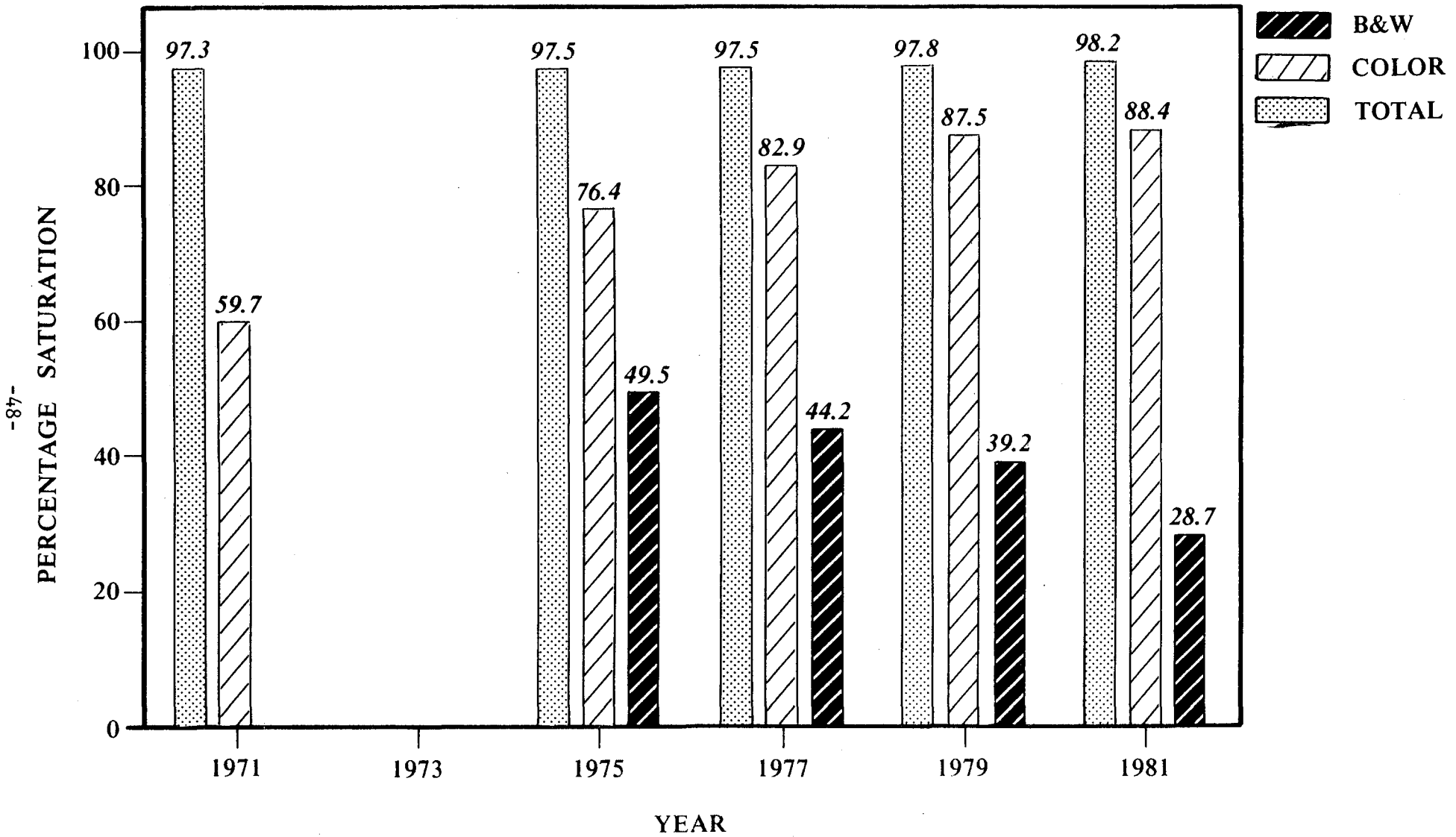
SATURATION OF APPLIANCES

Television Sets

Ninety eight percent of the homes in the service territory have at least one television set. While the percentage of customers owning a black and white set has been declining, the percentage owning a color set has increased dramatically and is just now leveling off. In fact, 88.4% of all households now own at least one color television; 20.9% own more than one. This brings the total to 111.9 color televisions per 100 customers. The largest number of color television sets are owned by:

- New single, family homes (134.8 per 100 customers)
- Home owners (126.3 per 100 customers)
- Households with 5 or more persons (121.8 per 100 customers)
- Households earning in excess of $40,000 per year (139.1 per 100 customers)
- Established families (125.5 per 100 customers)
- Households in the coastal climate zone (112.1 per 100 customers)
- Households in the Orange County SDG&E service territory (122.6 per 100 customers)
- Households with high consumption - more than 400 kwhrs per month (136.1 per 100 customers)

TELEVISION
% OF SATURATION
(FOR ALL CUSTOMERS)

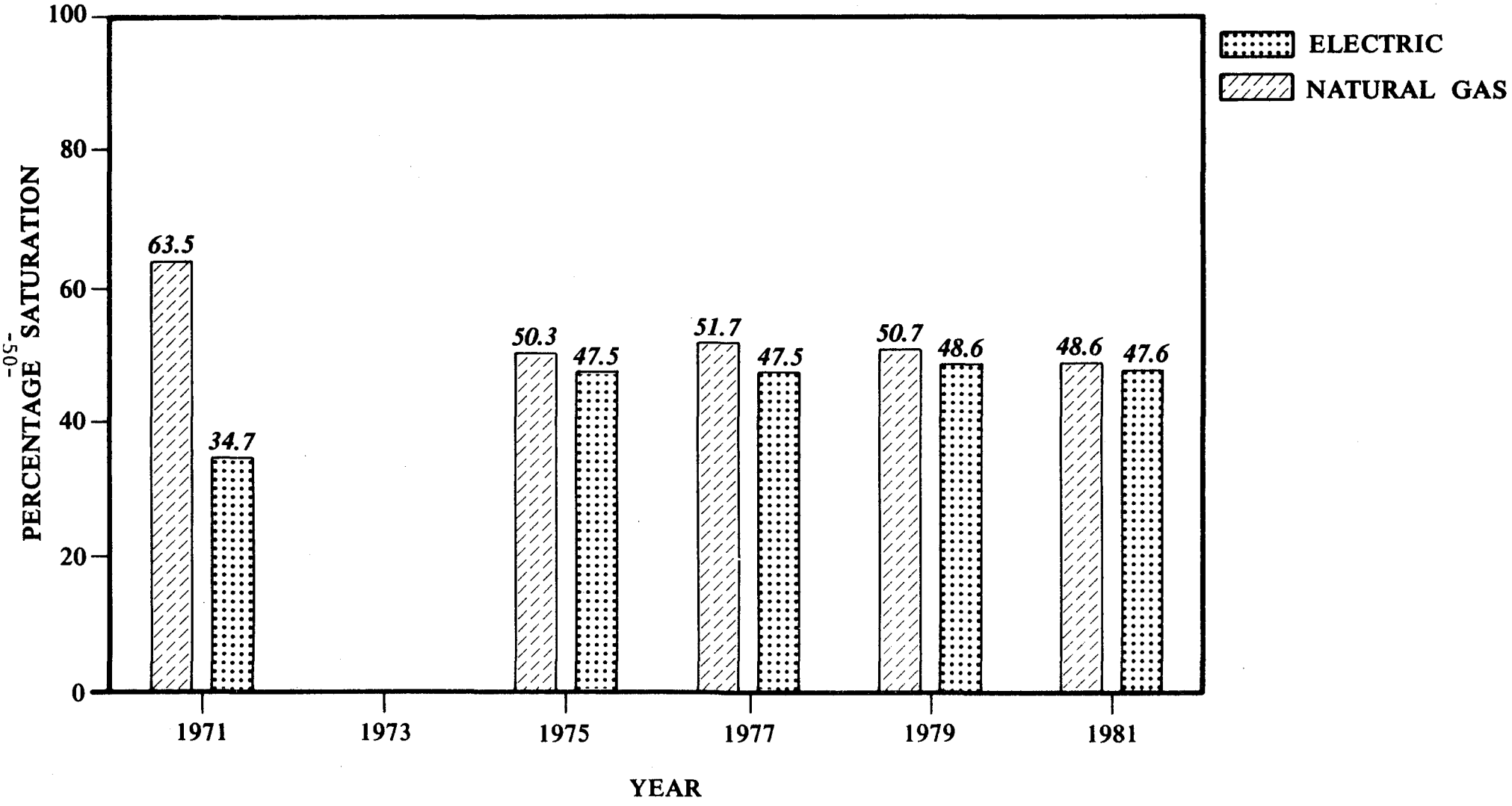


Ranges

Saturation of electric ranges steadily increased between the period 1970-1975 most likely as a result of consumer demand for a cleaner cooking fuel. This percentage has remained relatively constant since 1975. Above average percentages of electric ranges are currently found among:

- New single family homes (74.6%)
- Homes with high consumption (73.7%)

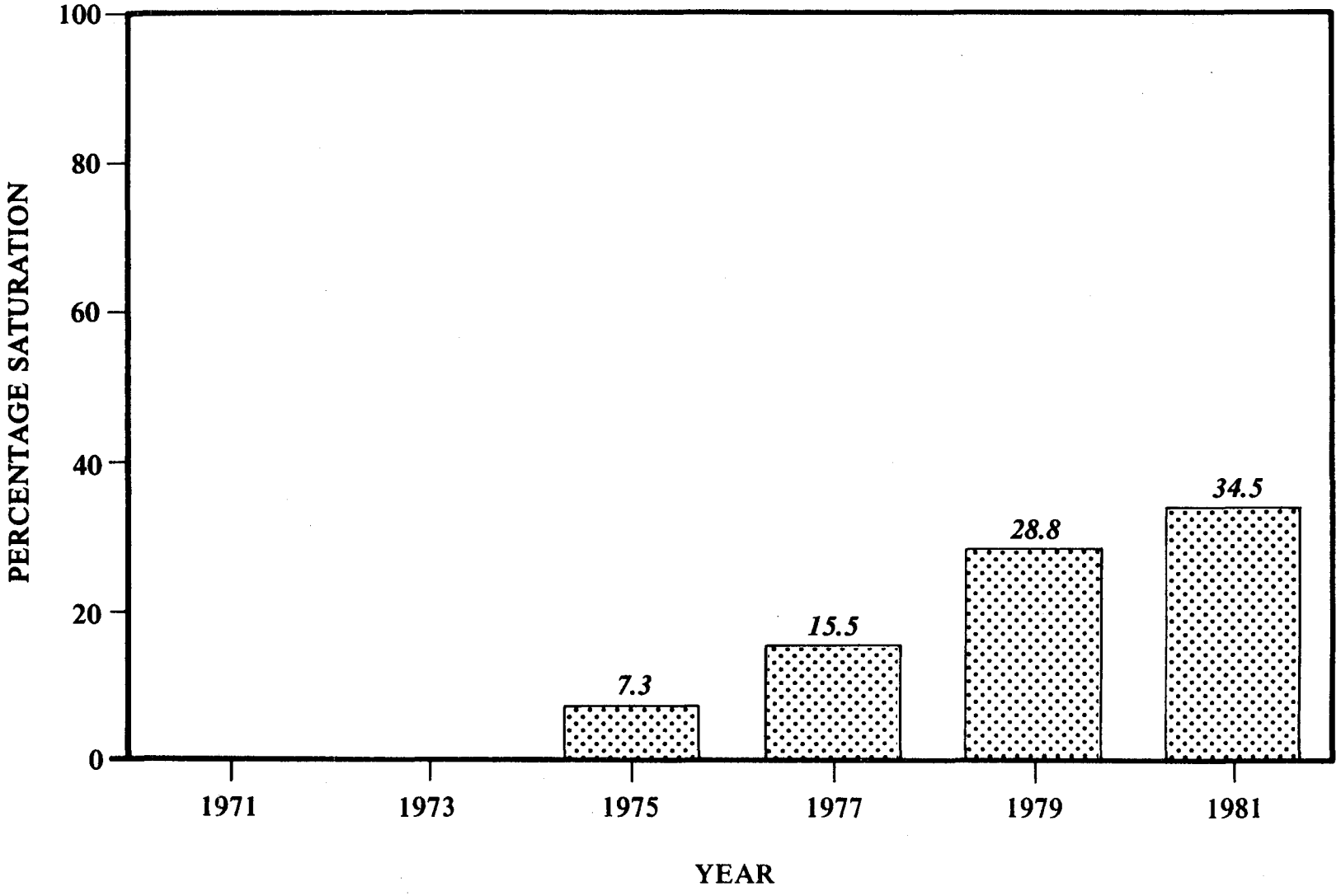
RANGES
% OF SATURATION
(FOR ALL CUSTOMERS)



Microwave Ovens

Saturation of microwave ovens has increased five-fold since 1975. The highest levels of ownership are found among new single family homes (three out of four), while considerably lower saturations (less than 15%) are found among households with yearly incomes less than $12,500, renters, and occupants of apartments and condos. It is expected that the upward trend in microwave oven ownership will continue particularly as more women join the workforce and as the per unit cost declines. This market should be considered far from saturated.

MICROWAVE OVENS
% OF SATURATION
(FOR ALL CUSTOMERS)

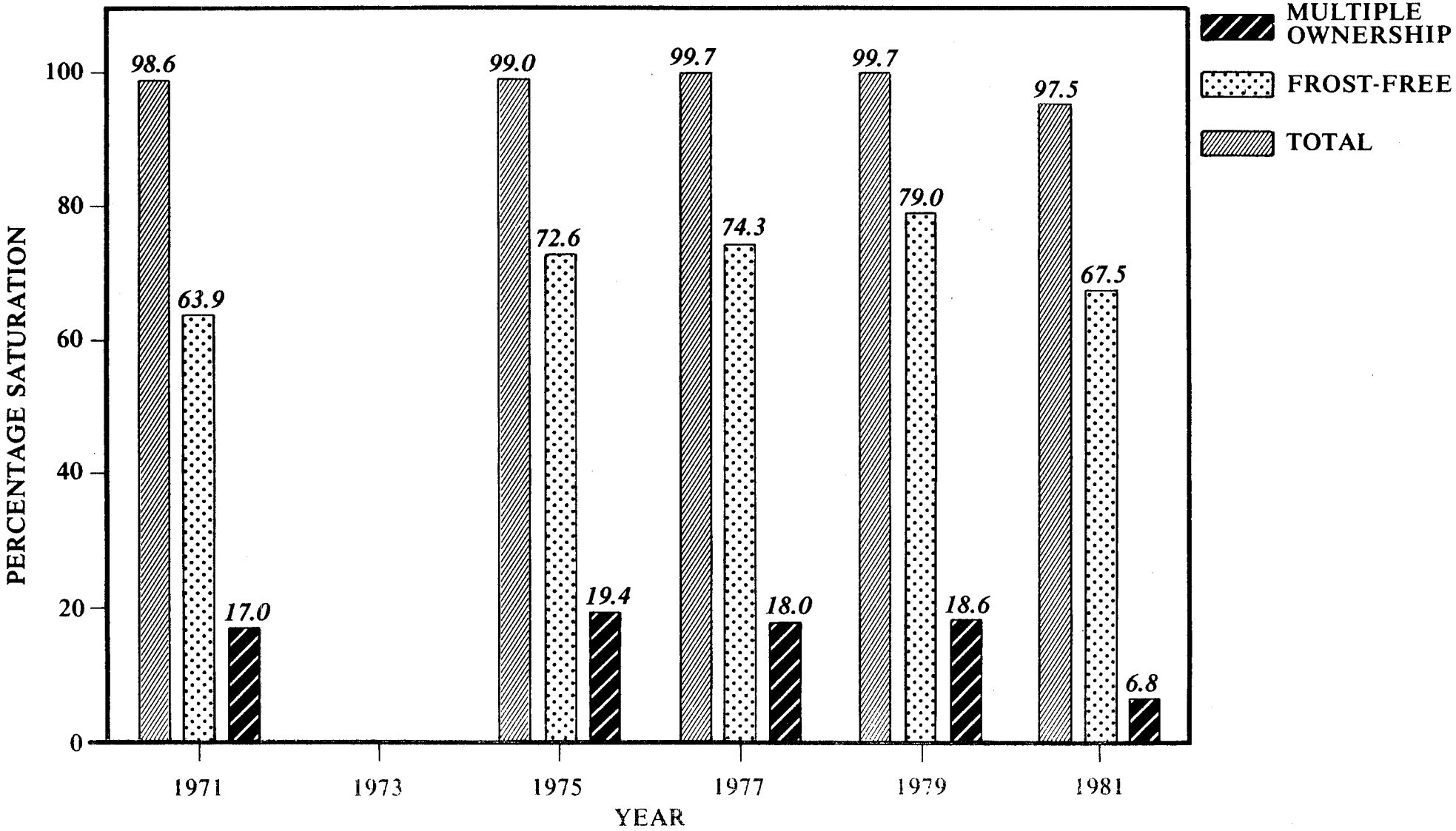


Refrigerators

The market for refrigerators has been fully saturated for a number of years; nearly every customer owns at least one, while 6.8% own more than one. Ownership of multiple refrigerators has decreased dramatically over the past two years. This downward trend can be attributed to the rising cost of energy and in turn the rising cost of operating a refrigerator.

The trend over the past few years has been toward frost-free appliances. Nearly seven out of every ten households has a refrigerator with this feature. The lowest level of frost-free refrigerator ownership occurs among apartment or condominium dwellers and households comprised of young adults (19-24). Since most apartments come equipped with refrigerators, it is not surprising to find lower ownership levels for the higher-priced frost-free models.

REFRIGERATORS
% OF SATURATION
(FOR ALL CUSTOMERS)



Freezers

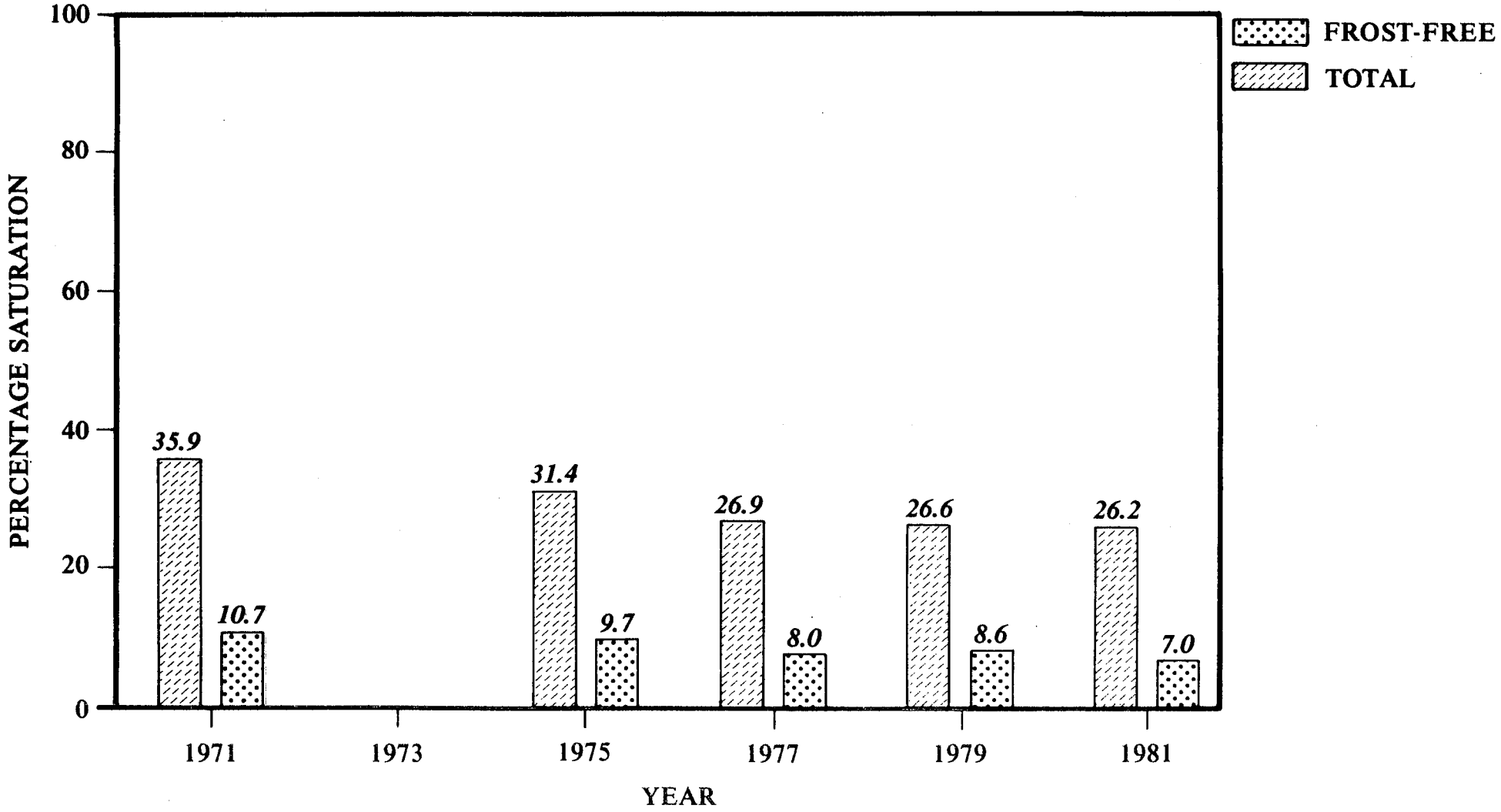
The market for freezers reached its highest level in 1971 with over one-third of all households owning one. This figure has decreased approximately 10 percentage points in the past ten years. This decrease may be attributed to the rising cost of energy and in turn the increased cost in operating a freezer.

Currently, slightly more than one in four famalies owns a freezer. The mix of frost-free freezers is decreasing slowly, with less than one-third having this feature.

The ratio of chest to upright-type freezers has not changed significantly over time. Approximately half of the freezers are upright models. The highest levels of freezer ownership are found among:

- New single family homes (33.4%)
- Homeowners (34%)
- Established families (38.5%)
- Households with 5 or more persons (39.2%)
- Households earning in excess of $40,000 per year (35%)
- Households with high consumption (41.7%)

FREEZERS
% OF SATURATION
(FOR ALL CUSTOMERS)

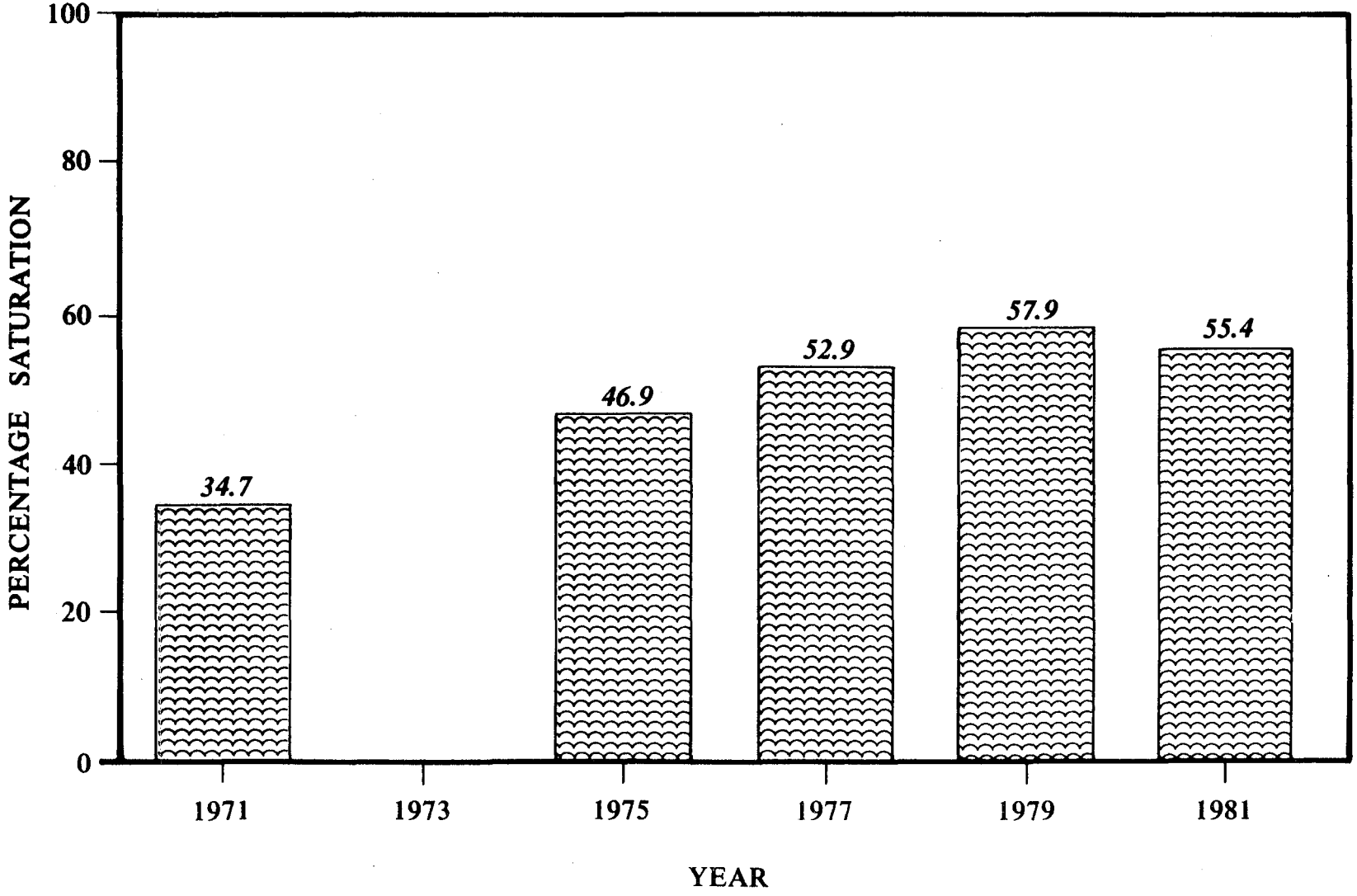


Dishwashers

The percentage of households owning a dishwasher has increased steadily over the past ten years. However, the percentage decreased slightly in 1981 by 2.5%. This decrease can be attributed to the change in sampling strategy in 1981, which included master-metered customers, who are less likely to own a dishwasher.

In 1971 only one-third of all households owned a dishwasher; by 1981 this figure had grown to over 55%. Newer homes are particularly likely to have a dishwasher, as are households who earn more than $40,000 per year. Within these groups approximately 90% own a dishwasher.

DISHWASHERS
% OF SATURATION
(FOR ALL CUSTOMERS)

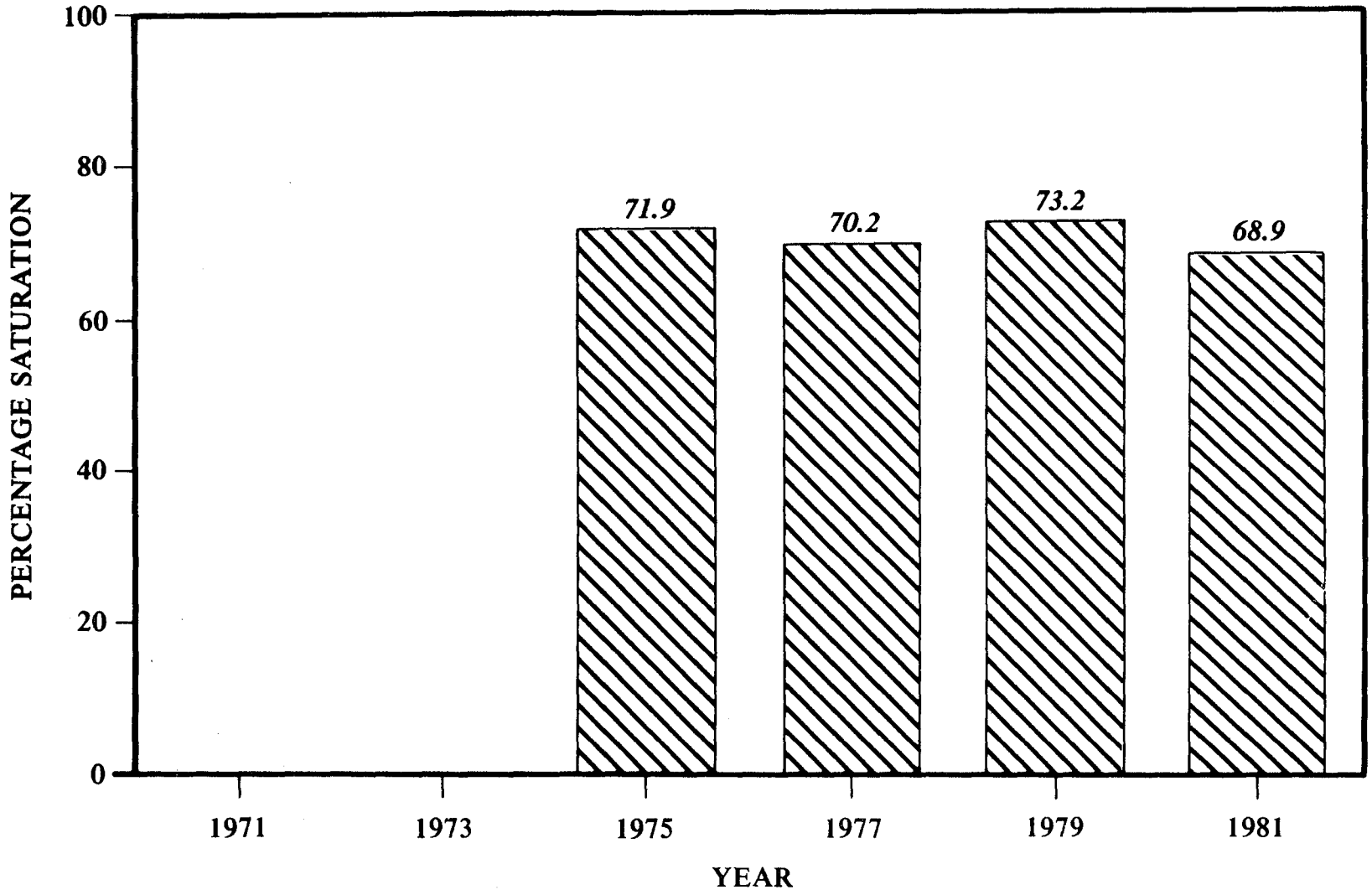


Washing Machines

The saturation of in-home washing machines has remained nearly constant over the past six years. As might be expected, new single family homes are the most likely to have this type of appliance (92.6%) while apartments or condominiums are the least likely (13.7%). In the latter case, however, nearly three of four apartments or condominiums do have access to a washing machine in a central-use facility. Similarly, while less than one-fourth of all renters own a washing machine, 67.2% use one in a central facility. Demographic groups which are most likely to own this appliance include:

- Households with five or more persons (88.5%)
- Households earning $40,000 or more per year (90.8%)
- Established families (88.0%)
- Single family owners (94.8%)
- Households with high consumption (89.8%)

WASHING MACHINES
% OF SATURATION
(IN HOME APPLIANCES ONLY)

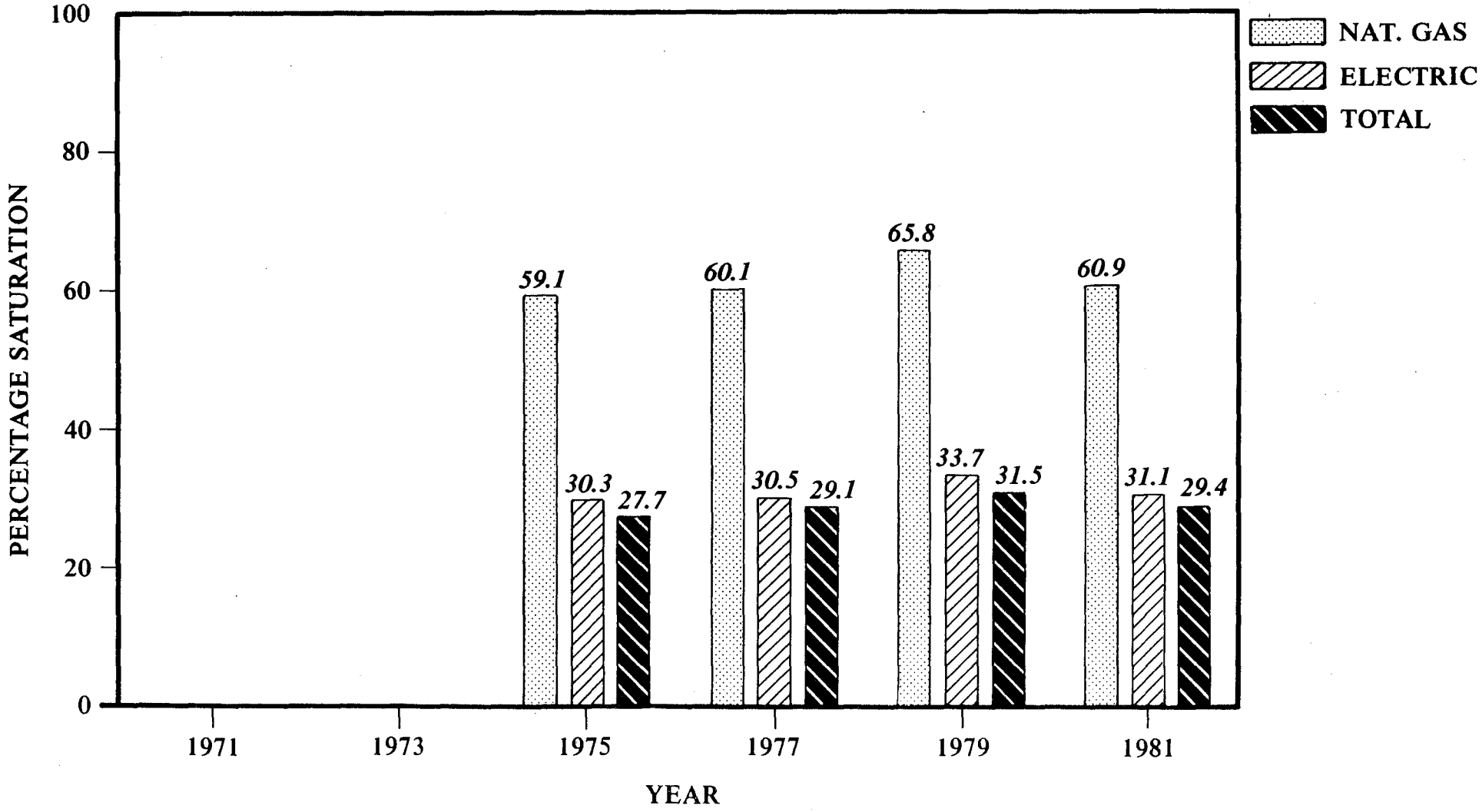


Clothes Dryers

On the average slightly more than eight of ten customers either own a clothes dryer or have access to one through a centrally located facility. Approximately one-third of all clothes dryers are electric and individually owned. This saturation level has grown only modestly over the past five or six years. The saturation of gas dryers is about the same as that for electric dryers (29.4%) and similarly has grown only modestly since 1975. Those custmers which are more likely to have a higher propertion of electric in-home dryers are:

- New single family homes (51.8%)
- Townhomes (57.5%) and mobile homes (51.1%)
- Residences in the inland climate zone (82.8%)
- Households with high consumption (62.3%)

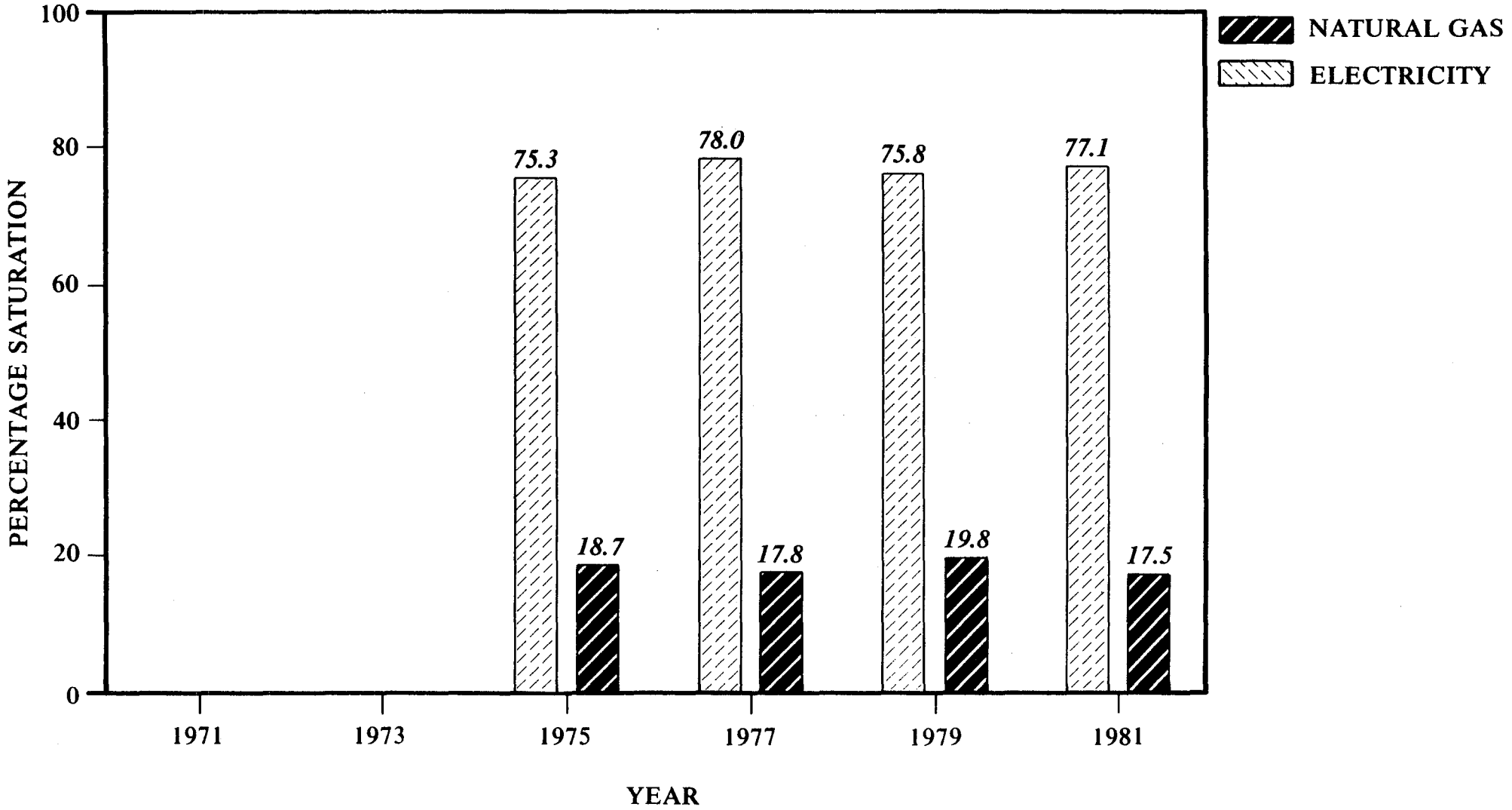
CLOTHES DRYERS
% OF SATURATION
(IN HOME APPLIANCES ONLY)



Space Heating

The relative saturation of natural gas and electric space heaters has remained approximately the same over the past five or six years; somewhat less than one in five homes is heated by electricity while more than three in four use natural gas. However, these saturation levels vary widely by residential type. Apartments or condomimiums have a significantly higher incidence of electric space heating, 52.2%. At the opposite end of the spectrum are mobile homes, 88.3% of which are heated by natural gas.

SPACE HEATING
% OF SATURATION
(FOR ALL CUSTOMERS)

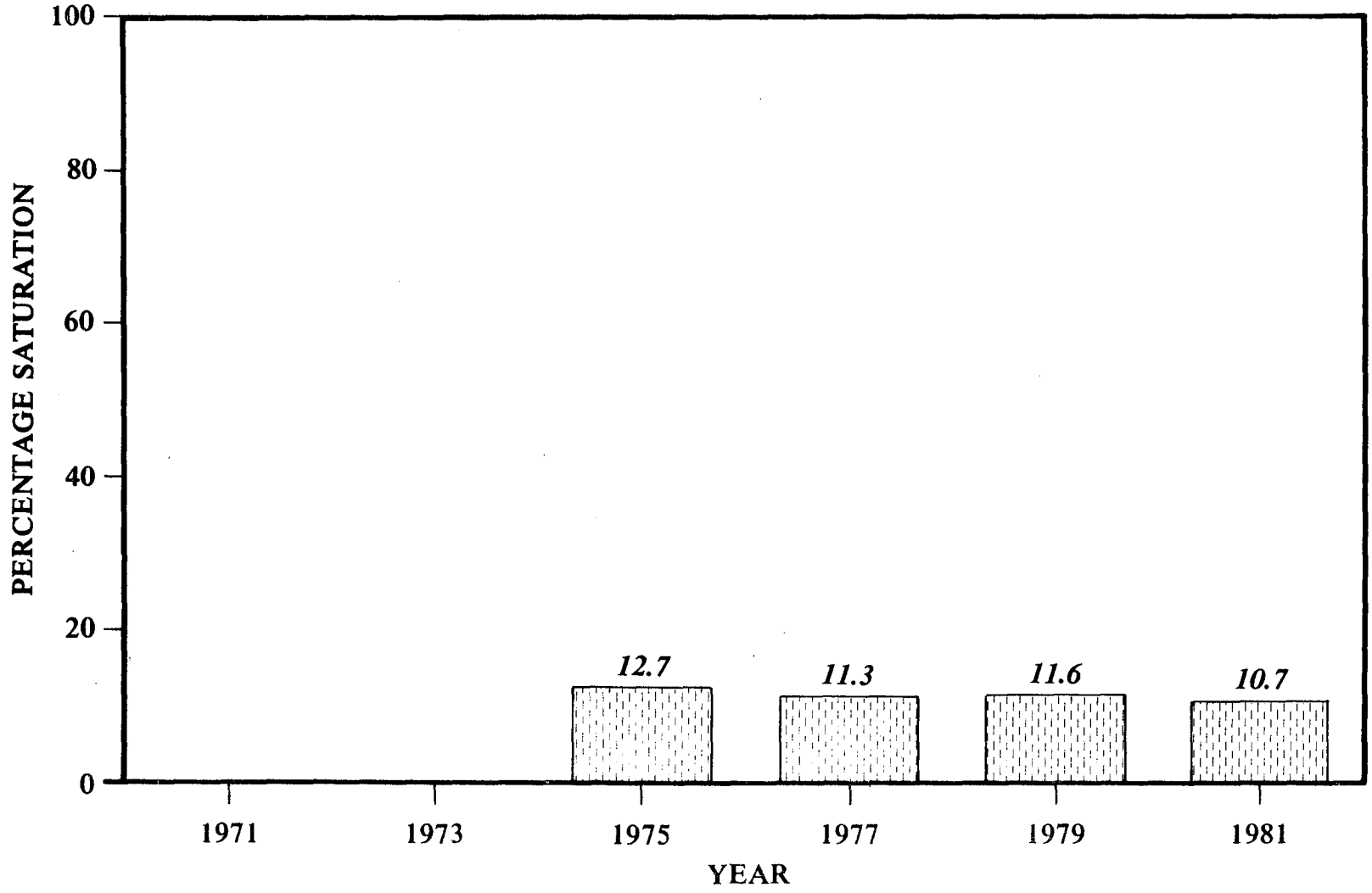


Air Conditioners*

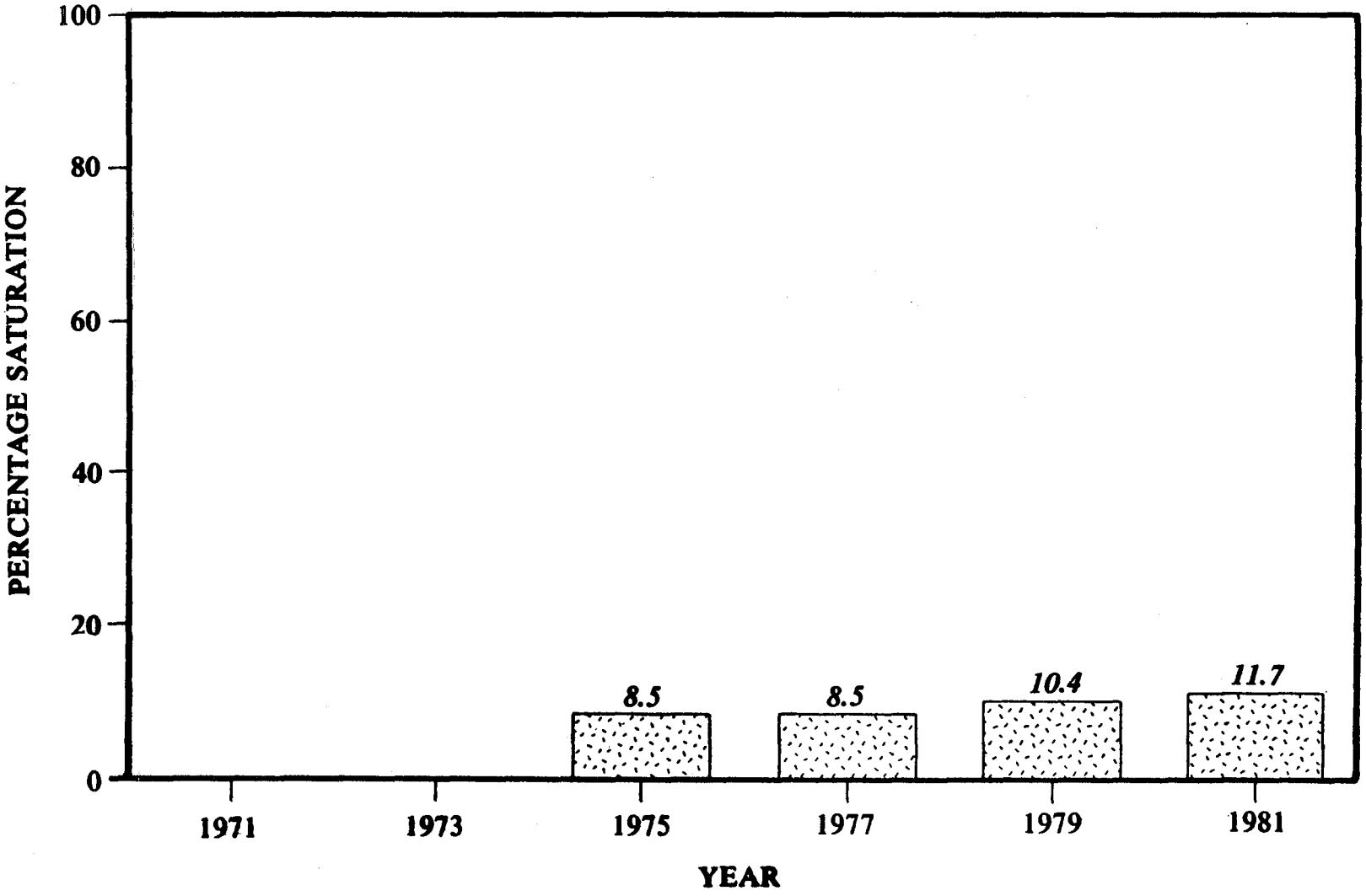
The saturation of air conditioners has remained relatively constant over the past five or six years. On the average 25% of all households in the service territory have some type of air conditioning system. Among mobile homes, however, this figure climbs to 60%. Window-wall units are found predominantly among apartment or condominium dwellers. Over 20% of all apartments have at least one window-wall unit. On the other hand the highest saturations for electric central systems are found in mobile homes (26.4%) and to a lesser extent in townhouses and new single family homes (13.8% and 15.6%, respectively).

*See tables in Chapter 1 for complete breakdown of air conditioners by type.

WINDOW-WALL AIR CONDITIONERS
% OF SATURATION
(FOR ALL CUSTOMERS)



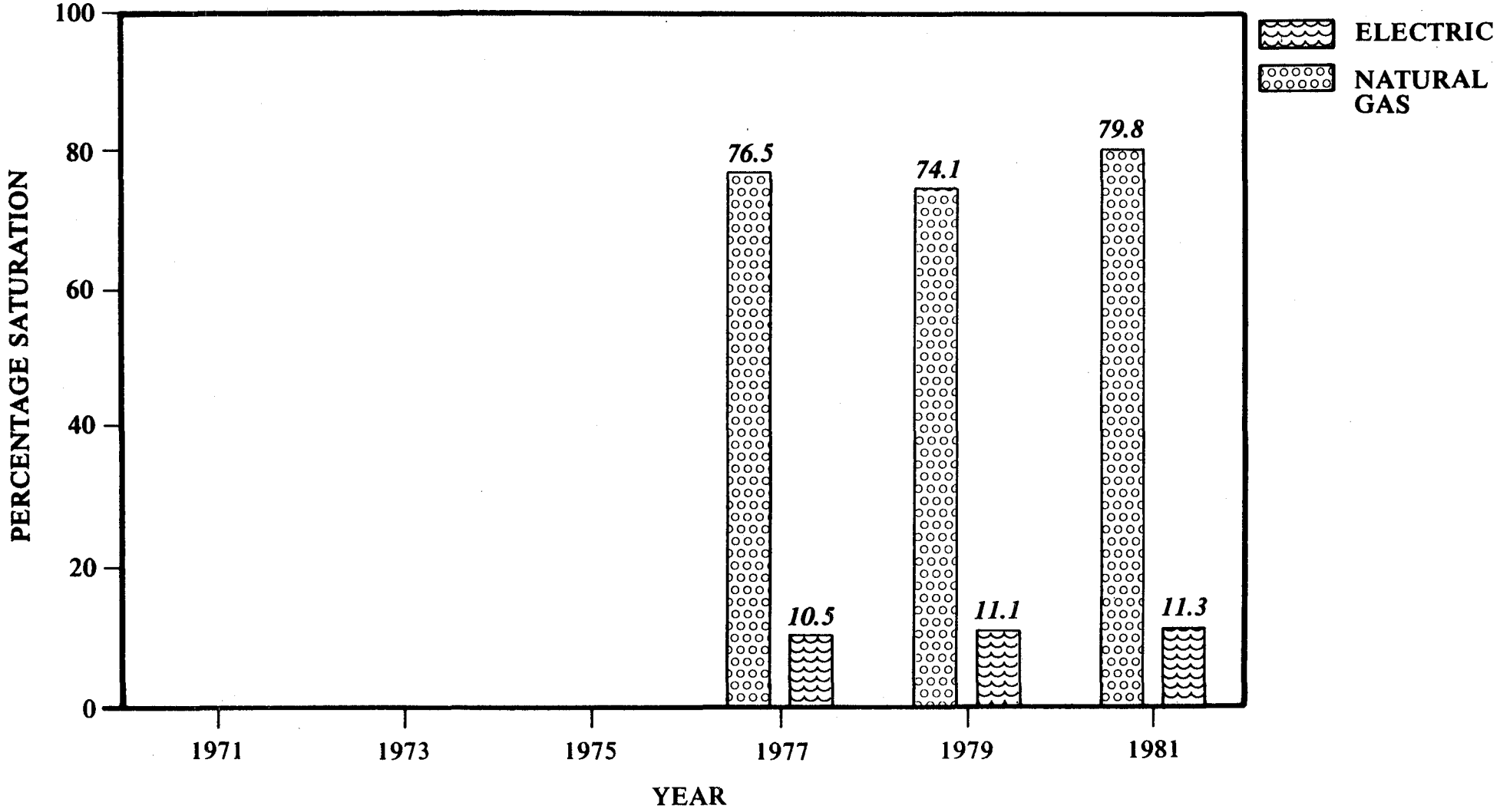
ELECTRIC CENTRAL AIR CONDITIONERS (INCLUDING HEAT PUMPS) % OF SATURATION (FOR ALL CUSTOMERS)



Water Heaters

The question of water heater type was changed in 1977 to include central units as a separate entity. Consequently the data is comparable for the last three survey periods only. On the average approximately 10% of water heaters are electric while four out of five in-home water heaters are gas fueled. As was the case in 1979, the only characteristic which appears to correlate with the type of water heater owned is age and type of home. Townhouses and apartments/condominiums are much more likely to have an electric water heater (23.8% and 23.8% respectively); while new single family homes have higher saturations of solar water heating (15.3%, compared to the system average of 3.4%). This higher saturation is due to a recent (the past 5 years) San Diego County building code which requires solar water heating in all new dwellings being built.

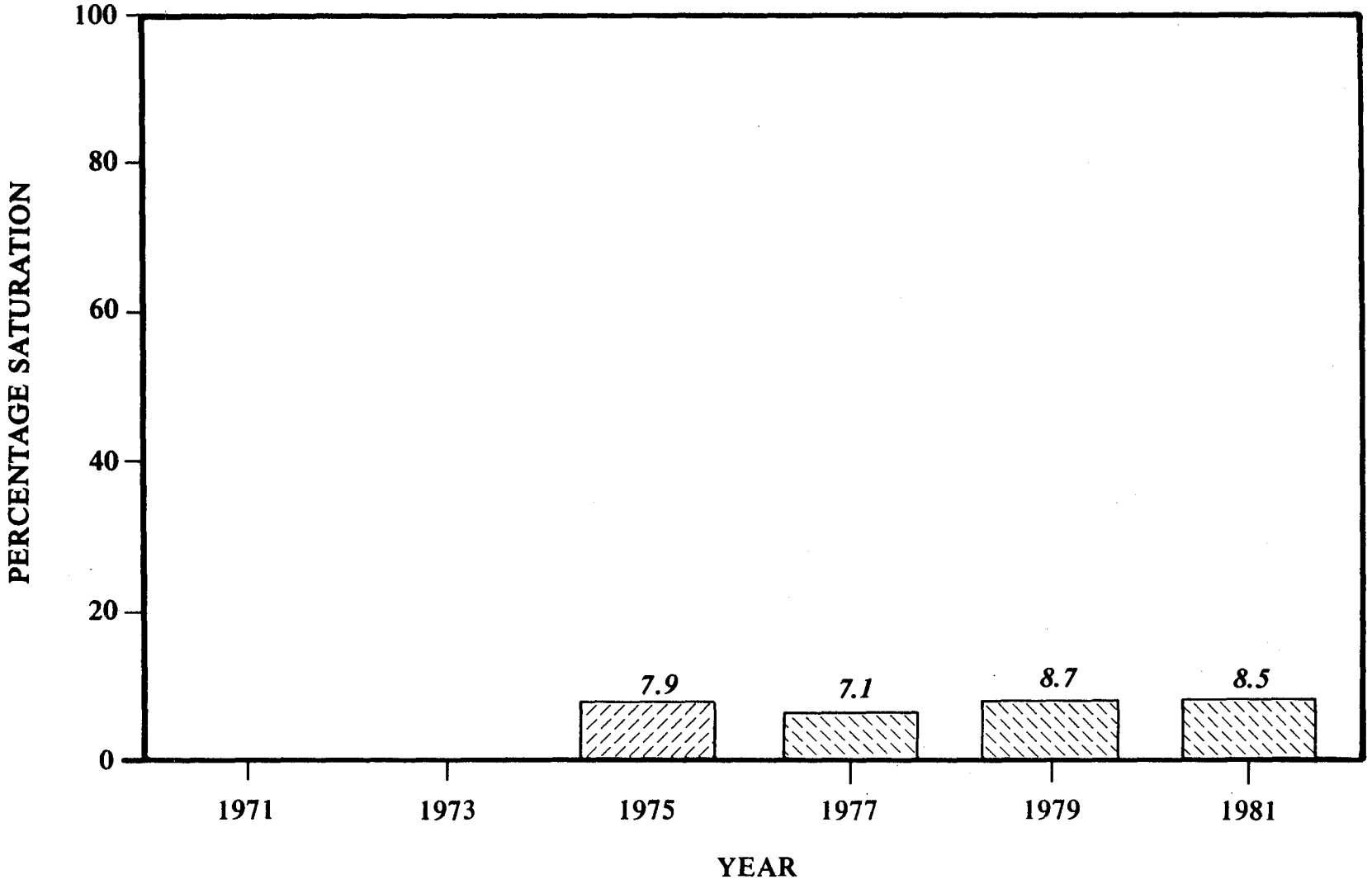
WATER HEATERS
% OF SATURATION
(IN HOME ONLY)



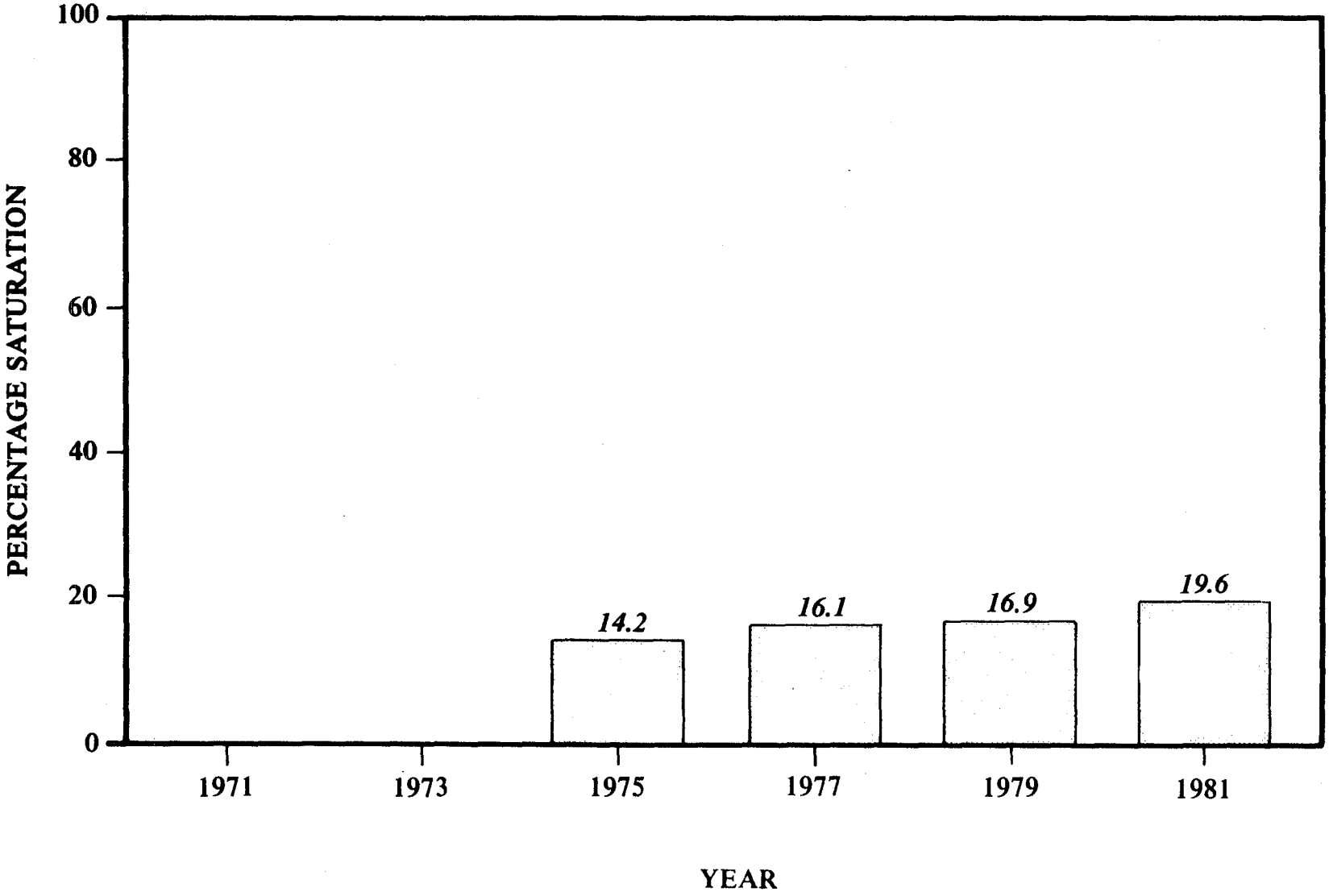
Swimming Pool Heaters-Gas

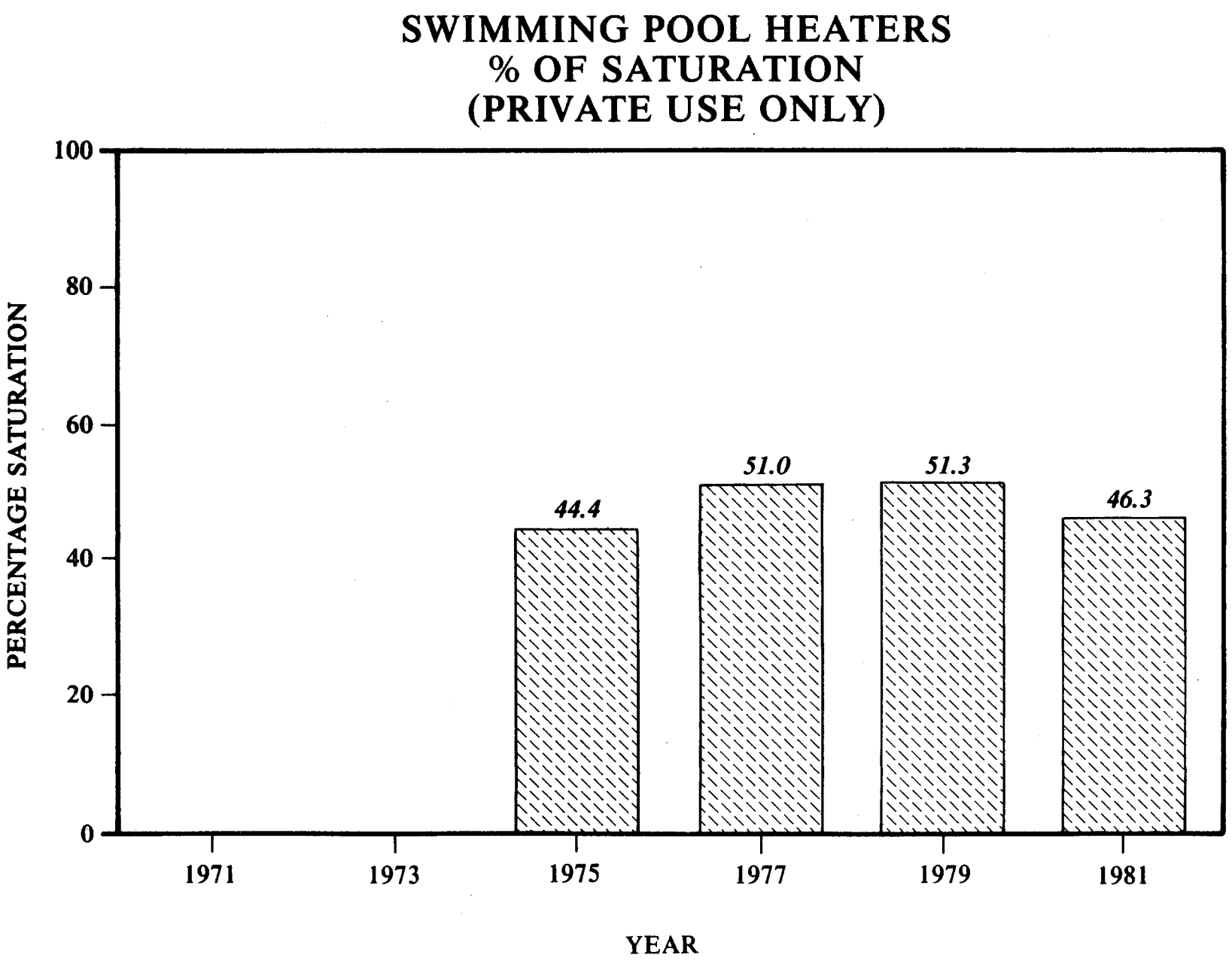
On a system-wide basis, 8.5% of all customers own a swimming pool, while 19.6% have the use of one through a central facility. The graphs on the next few pages refer to the saturation of gas pool heaters among owners of private pools only. Almost one half of these pool owners have a natural gas heater. Because of the 1980 County ordinance which mandates that all newly installed pools with natural gas heaters have a primary solar system, the saturation level of natural gas heaters has decreased, while solar has increased.

SWIMMING POOLS
FOR PRIVATE USE ONLY
% OF SATURATION



SWIMMING POOLS
FOR CENTRAL USE ONLY
% OF SATURATION




SWIMMING POOL HEATERS
% OF SATURATION
(PRIVATE USE ONLY)
PERCENTAGE SATURATION
100
80
60
40
20
0
44.4
51.0
51.3
46.3
1971
1973
1975
1977
1979
1981
YEAR

Saturations by Dwelling Type: Home Information (Percent)

	Single Family	New Single Family	Multi-Family: Duplex-Triplex	Multi-Family: Town-house	Multi-Family: Apt. or Condo	Mobile Home
Home Ownership						
Own	85.2	92.1	33.5	60.7	16.3	96.7
Rent/Lease	14.1	7.1	65.7	37.9	83.1	2.5
Other	0.7	0.8	0.8	1.4	0.6	0.8
Age of Home						
1980 or later	0.0	100.0	2.4	3.9	3.3	2.5
1979	4.3	0.0	4.0	8.2	4.8	3.5
1975-1978	12.6	0.0	10.3	22.1	16.5	19.8
1970-1974	15.4	0.0	12.6	23.4	20.7	35.4
1960-1969	22.4	0.0	10.7	14.4	14.8	28.7
1950-1959	21.9	0.0	17.8	7.0	4.8	5.7
1940-1949	8.5	0.0	7.1	2.5	1.6	1.0
Before 1940	8.1	0.0	9.5	3.4	3.0	0.5
Don't Know	6.7	0.0	25.7	15.2	30.6	3.0
Number of Bedrooms						
Studio	0.3	0.0	1.6	0.8	4.0	0.5
One	3.1	0.8	18.8	8.7	39.5	17.0
Two	23.1	13.5	59.2	44.5	48.1	71.5
Three	47.2	37.3	16.3	36.0	7.4	9.5
Four	22.5	41.3	3.1	8.8	0.5	1.5
Five	3.2	7.1	0.6	0.9	0.1	0.0
Six or more	0.5	0.0	0.4	0.3	0.4	0.0
Square Footage						
Less than 300 sq. feet.	0.3	0.0	2.9	1.0	2.1	3.1
300-499 Sq. ft.	0.9	2.5	4.9	1.0	6.3	4.7
500-799 Sq. Ft.	2.4	0.0	12.1	4.0	14.7	15.4
800-1099 Sq. Ft.	9.8	1.6	18.0	13.9	18.0	12.2
1100-1299 Sq. Ft.	12.2	4.1	7.0	17.1	7.7	12.2
1300-1599 Sq. Ft.	17.3	10.7	6.5	16.5	4.7	31.8
1600-1999 Sq. Ft.	19.7	22.1	5.5	10.7	2.0	5.2
2000-2399 Sq. Ft.	10.0	18.9	2.9	3.7	0.5	0.5
2400-2999 Sq. Ft.	6.7	23.0	0.6	2.4	0.1	0.5
3000 Sq. Ft. or more	3.4	12.3	0.8	0.5	0.2	0.0
Not Sure	17.3	4.9	38.9	29.4	43.6	14.3

	Single Family	New Single Family	Multi-Family Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Ceiling Insulation						
None	27.0	3.7	50.0	31.4	52.9	20.5
R11 or less	1.2	2.8	1.6	0.8	0.9	0.7
R11 thru R18	2.8	3.7	0.3	1.3	0.5	1.4
R19 or greater	12.0	28.4	4.0	7.2	4.8	3.6
Don't Know	57.1	61.5	44.1	59.3	40.9	73.7
Wall Insulation						
None	31.8	3.2	29.5	15.8	17.3	10.2
Yes	37.0	82.3	18.9	30.3	12.8	64.6
Don't Know	31.2	14.5	51.6	53.9	69.9	25.2
Years Lived in Residence						
Less than 1 Year	8.0	41.3	19.5	18.9	27.7	8.7
1 to 5 Years	39.8	51.6	53.2	52.9	55.2	37.0
6 to 10 Years	19.3	2.4	13.2	16.9	12.6	33.9
11 to 15 Years	11.0	3.2	6.5	5.3	2.8	13.0
16 to 20 Years	7.7	0.8	3.3	2.3	0.9	5.3
21 to 30 Years	10.4	0.0	3.4	2.6	0.6	1.2
30 Years or more	3.6	0.8	1.0	1.2	0.3	1.0

Saturations by Dwelling Type:
Household Information
(Percent)

	Single Family	New Single Family	Multi-Family Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Number of Residents						
One	10.9	5.0	26.6	22.9	39.8	29.8
Two	36.4	40.3	36.8	41.9	40.3	57.1
Three or Four	38.9	40.3	29.2	26.2	17.7	10.2
Five or Six	11.8	11.7	6.4	7.6	1.8	2.6
Seven or Eight	1.6	2.5	0.8	1.1	0.3	0.3
Nine or More	0.5	0.0	0.2	0.3	0.2	0.0
Residents in Specific Age Groups						
5 or under	7.6	10.6	11.0	7.3	7.5	4.0
6-9	5.6	6.7	4.8	5.2	3.1	1.7
10-14	8.0	7.3	4.9	5.9	3.2	2.4
15-18	7.6	3.9	3.9	5.0	2.4	1.1
19-24	8.3	6.2	12.5	12.6	19.6	3.1
25-34	15.8	22.3	25.2	19.8	25.5	6.8
35-44	14.1	14.8	7.1	12.4	9.2	3.8
45-54	11.5	8.8	8.2	9.3	6.2	9.0
55-64	11.5	12.7	8.2	12.4	7.8	19.8
65 or Older	10.0	6.5	14.2	9.9	15.5	48.3
Residents Age 5 or Under						
None	83.1	75.2	80.8	86.3	88.9	94.5
One	11.4	17.4	13.3	10.3	8.1	3.4
Two	4.9	5.8	4.6	2.4	2.7	1.8
Three	0.5	1.7	1.0	0.8	0.3	0.3
Four	0.1	0.0	0.2	0.2	0.0	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.1	0.0
Residents Age 6-9						
None	86.2	79.3	90.5	89.0	94.6	97.1
One	11.1	19.8	7.7	9.6	4.8	2.3
Two	2.5	0.8	1.6	1.1	0.7	0.5
Three	0.2	0.0	0.2	0.2	0.0	0.0
Four	0.0	0.0	0.0	0.2	0.0	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.0	0.0
Residents Age 10-14						
None	82.3	84.2	91.7	88.4	95.1	96.9
One	12.4	10.0	5.3	8.8	3.6	1.8
Two	4.4	4.2	2.6	2.5	1.2	1.0
Three	0.7	1.7	0.4	0.3	0.1	0.3
Four	0.1	0.0	0.0	0.0	0.0	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.0	0.0

	Single Family	New Single Family	Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Residents Age 15-18						
None	83.1	89.2	92.7	91.1	96.0	98.2
One	12.0	9.2	5.9	6.1	3.3	1.6
Two	3.9	1.7	1.0	2.4	0.6	0.3
Three	1.0	0.0	0.2	0.2	0.1	0.0
Four	0.0	0.0	0.2	0.3	0.0	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.0	0.0
Residents Age 19-24						
None	81.9	87.5	80.0	78.9	74.4	95.1
One	12.7	8.3	11.9	13.5	14.7	3.9
Two	4.7	0.8	6.9	5.9	9.5	1.0
Three	0.5	3.3	0.8	1.1	0.9	0.0
Four	0.2	0.0	0.2	0.3	0.4	0.0
Five to Nine	0.0	0.0	0.2	0.3	0.1	0.0
Residents Age 25-34						
None	69.5	55.8	59.8	66.0	62.7	91.2
One	14.7	17.5	21.2	19.4	25.0	4.4
Two	15.0	25.8	18.2	14.1	11.8	4.4
Three	0.7	0.8	0.4	0.3	0.4	0.0
Four	0.1	0.0	0.4	0.0	0.0	0.0
Five to Nine	0.0	0.0	0.0	0.2	0.1	0.0
Residents Age 35-44						
None	70.8	69.4	86.5	76.8	85.2	94.0
One	16.2	14.0	10.3	16.1	11.8	4.4
Two	12.9	16.5	3.0	7.0	2.8	1.6
Three	0.0	0.0	0.2	0.0	0.0	0.0
Four	0.0	0.0	0.0	0.0	0.1	0.0
Five to Nine	0.0	0.0	0.0	0.2	0.1	0.0
Residents Age 45-54						
None	76.3	80.0	84.4	82.8	89.9	87.5
One	13.0	11.7	11.5	11.1	8.3	7.3
Two	10.6	8.3	4.0	6.1	1.8	5.2
Three	0.1	0.0	0.0	0.0	0.0	0.0
Four	0.0	0.0	0.0	0.0	0.1	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.0	0.0
Residents Age 55-64						
None	75.9	77.0	85.3	78.7	88.0	72.4
One	13.8	9.8	10.1	12.1	8.9	16.8
Two	10.2	12.3	4.4	9.1	3.0	10.8
Three	0.0	0.0	0.2	0.0	0.1	0.0
Four	0.0	0.0	0.0	0.0	0.0	0.0
Five to Nine	0.0	0.8	0.0	0.2	0.1	0.0

	Single Family	New Single Family	Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Residents Age 65+						
None	78.9	86.7	75.2	81.4	77.4	37.3
One	12.4	6.7	15.9	12.4	15.6	32.6
Two	8.6	5.8	8.7	6.2	6.8	29.3
Three	0.1	0.8	0.2	0.0	0.1	0.8
Four	0.0	0.0	0.0	0.0	0.1	0.0
Five to Nine	0.0	0.0	0.0	0.0	0.1	0.0
Educational Background Head of Household						
Elementary School	3.1	0.8	4.1	2.7	3.2	5.3
Some High School	5.8	2.5	8.8	6.7	5.9	12.4
High School Grad	17.8	11.5	24.3	15.9	21.6	31.4
Trade or Tech	5.2	3.3	7.6	5.7	4.5	6.3
Some College	20.8	19.7	23.1	21.5	22.8	22.4
2 Yr Coll. Grad	11.2	8.2	7.8	11.0	9.5	6.3
4 Yr Coll. Grad or above	36.1	54.1	24.3	36.6	32.5	15.8
Total Annual Household Income						
Less than $2,499	1.2	0.0	5.4	1.6	4.2	2.5
$2,500-$4,999	2.6	0.0	6.9	3.4	7.7	7.3
$5,000-$7,499	3.9	2.2	11.5	6.3	10.9	12.9
$7,500-$9,999	5.0	2.2	8.1	5.0	9.8	9.5
$10,000-$12,499	6.8	3.3	13.8	8.3	11.6	18.0
$12,500-$14,999	5.0	2.2	9.6	9.5	9.8	9.1
$15,000-$19,999	12.2	5.4	17.0	12.3	14.6	13.6
$20,000-$24,999	14.2	8.7	9.8	14.9	12.8	10.4
$25,000-$29,999	11.9	7.6	4.2	10.1	6.5	6.3
$30,000-$34,999	11.3	9.8	5.2	8.3	3.5	3.2
$35,000-$39,999	7.1	13.0	2.7	5.1	3.2	2.5
$40,000-$44,999	5.3	7.6	1.2	5.3	1.6	1.6
$45,000-$49,999	3.0	12.0	1.7	2.2	0.8	0.3
$50,000 or more	10.3	26.1	2.9	7.7	3.2	2.8

Saturations by Dwelling Type:
Space Conditioning
(Percent)

	Single Family	New Single Family	Multi-Family Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Space Heating Fuel						
Electricity	8.1	12.8	10.5	30.8	52.2	2.0
Natural Gas	86.4	76.1	86.0	66.3	43.5	88.3
Bottled Gas	2.5	6.0	0.0	0.3	0.0	8.1
Solar System	0.1	1.7	0.0	0.0	0.2	0.0
Other	2.1	1.8	1.7	0.3	0.4	0.6
Don't Know	0.7	1.7	1.9	2.2	3.8	1.1
Space Heating System						
Electric Forced Air	2.0	2.7	2.0	7.7	3.9	0.9
Electric Floor, Ceil	4.4	4.5	7.0	19.5	41.2	0.6
Electric Heat Pump	3.1	7.3	0.7	0.8	1.0	0.9
Gas Forced Air	52.4	69.1	24.4	39.6	10.6	59.2
Gas Wall, Floor	31.7	9.1	54.5	22.9	29.0	31.4
Other	3.5	3.6	2.6	2.3	3.4	2.1
None	2.8	1.8	7.2	4.9	5.7	4.2
Don't Know	1.1	1.8	1.6	2.2	5.2	1.2
Additional Electric Heaters						
None	89.4	92.2	91.1	92.1	94.1	85.3
One	8.7	7.9	7.3	6.7	5.4	13.5
Two	1.4	0.0	1.3	1.0	0.4	1.2
Three or More	0.3	0.0	0.2	0.2	0.1	0.0
Air Conditioning System						
Electric Central	9.0	15.6	3.8	13.8	10.5	26.4
Window, Wall	10.1	1.6	8.6	6.0	19.7	7.6
Heat Pump	1.8	9.0	0.2	0.3	0.7	0.5
Evaporative	1.2	0.8	0.6	0.3	0.4	21.7
Gas Central	1.9	3.3	0.6	2.1	0.5	2.1
Other	0.2	0.0	0.0	0.0	0.1	1.8
None	75.3	68.9	85.9	77.1	67.0	38.9
Don't Know	0.4	0.8	0.2	0.3	1.0	1.0
Number of Window, Wall Air Conditioners						
One	9.0	2.4	8.0	5.4	20.6	9.4
Two	1.4	0.8	0.8	0.8	0.5	0.5
Three or More	0.3	0.0	0.4	0.7	0.2	0.2

Saturations by Dwelling Type:
Appliances
(Percent)

	Single Family	New Single Family	Multi-Family Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Television						
None	1.3	1.6	2.7	2.4	3.2	1.2
B&W Only	6.5	3.2	15.4	8.8	19.9	5.0
Color Only	69.2	73.0	68.6	70.5	67.2	80.4
Both	23.0	22.2	13.3	18.2	9.7	13.4
Number of B&W Televisions						
One	25.9	23.0	27.6	24.5	28.0	16.6
Two	3.2	2.4	1.2	2.3	1.4	1.0
Three	0.2	0.0	0.0	0.2	0.2	0.7
Four or More	0.2	0.0	0.0	0.2	0.2	0.0
Total*	33.7	27.8	30.0	30.5	32.2	20.7
Number of Color Televisions						
One	65.5	61.9	70.8	69.0	69.5	75.4
Two	23.6	27.0	10.7	17.1	6.5	17.0
Three	2.8	6.3	0.2	2.4	0.8	1.5
Four or More	0.4	0.0	0.2	0.2	0.1	0.0
Total*	122.7	134.8	93.6	110.6	85.3	116.8
Type of Cooking Range						
None	0.4	0.8	1.7	0.6	0.6	0.0
Electric	46.3	74.6	25.8	62.3	65.6	10.4
Natural Gas	50.0	21.4	70.0	34.8	32.5	78.7
Bottled Gas	1.3	2.4	0.6	0.9	0.1	8.7
Other	1.9	0.8	1.9	1.4	1.2	2.2
Microwave Oven	43.2	76.2	20.5	31.6	14.2	26.2
Type of Refrigerator						
None	1.4	0.8	6.4	4.0	4.1	1.5
Manual Defrost	14.1	7.4	30.8	19.8	48.3	29.4
Frost-Free	74.8	85.1	58.3	72.9	46.6	63.7
Both Manual & Frost Free	9.6	6.6	4.5	3.2	1.1	5.5
Number of Frost-Free Refrigerators						
One	78.2	77.4	60.8	74.1	47.4	64.9
Two	6.5	14.5	2.1	3.2	0.6	4.9
Three or More	0.3	0.0	0.2	0.2	0.0	0.0
Total*	92.1	106.4	65.6	81.1	48.6	74.7

*Number of Appliances Per 100 Customers

	Single Family	New Single Family	Multi-Family Duplex-Triplex	Multi-Family Town-house	Multi-Family Apt. or Condo	Mobile Home
Type of Freezer						
Upright-Manual Defrost	16.4	19.2	7.9	7.4	3.8	12.1
Upright-Frost-Free	8.6	10.0	5.2	4.8	3.5	7.4
Chest	7.3	4.2	3.1	4.5	2.5	9.3
Dishwasher	60.8	89.7	30.6	65.7	44.6	45.2
Washing Machine						
Private Use	90.9	92.6	50.3	67.8	13.7	55.3
Multi-Residence	0.8	0.8	20.2	19.9	76.7	39.0
Type of Clothes Dryer						
Electric	38.2	46.0	19.4	36.9	12.6	28.7
Natural Gas	40.4	39.7	19.0	25.3	5.3	22.8
Bottled Gas	0.9	1.6	0.2	0.3	0.1	0.9
Central Location	0.8	1.6	18.0	20.6	69.7	36.6
Don't Know	0.4	0.0	0.4	0.9	1.6	1.4
Type of Water Heater						
Electric	8.9	5.9	8.0	23.8	23.8	5.2
Natural Gas	82.7	68.6	86.2	70.1	53.0	86.4
Bottled Gas	1.9	5.1	0.7	0.6	0.4	6.5
Solar System	4.7	15.3	1.2	1.5	0.4	0.8
Central Location	0.2	0.0	1.4	1.5	18.0	0.0
Other	0.7	3.4	0.2	0.6	0.6	0.5
Don't Know	0.9	1.7	2.2	2.0	3.8	0.5
Swimming Pool						
Private Use	12.7	10.7	NA	NA	NA	NA
Multi-Residence	1.8	2.5	10.8	50.2	51.0	65.2
Swimming Pool Heaters (Among Swimming Pool Owners)						
None	44.1	30.8	62.5	32.0	14.8	14.3
Natural Gas	21.6	38.5	0.0	32.0	14.8	28.6
Solar Heat	20.2	23.1	12.5	8.0	7.4	0.0
Solar Blanket	9.1	7.1	12.5	2.6	1.4	7.4
Other	3.1	0.0	0.0	0.0	0.0	0.0
Don't Know	0.7	0.0	0.0	23.1	31.0	22.2
Jacuzzi*	11.0	23.8	8.3	30.9	27.6	39.0

*Includes Central Use Facilities

Selected Demographic Characteristics and
Appliance Saturations for the Owner/Renter Market

	Single Family Owners	Single Family Renters	Multi-Family Owners	Multi-Family Renters
Annual Household Income				
Less than $2,499	1.1	2.1	2.4	4.5
$2,500 - $4,999	2.0	5.5	1.9	8.4
$5,000 - $7,499	2.7	10.5	3.5	12.5
$7,500 - $9,999	4.2	9.7	4.6	10.1
$10,000 - $12,499	6.5	8.8	6.3	13.3
$12,500 - $14,999	4.4	7.8	7.1	10.7
$15,000 - $19,999	11.2	17.0	13.2	15.1
$20,000 - $24,999	13.7	16.0	15.7	11.6
$25,000 - $29,999	12.2	9.4	10.6	5.2
$30,000 - $34,999	12.4	4.2	8.7	3.2
$35,000 - $39,999	7.9	3.8	7.6	1.9
$40,000 - $44,999	6.0	1.7	4.6	1.5
$45,000 - $49,999	3.6	1.1	2.5	0.8
$50,000 or more	12.1	2.3	11.5	1.2
Number of Residents				
One	10.1	14.8	28.2	35.7
Two	37.8	29.3	45.7	37.7
Three or Four	38.5	40.7	19.3	22.8
Five or Six	11.5	13.4	5.8	3.1
Seven or Eight	1.7	1.3	0.6	0.4
Nine or More	0.4	0.6	0.4	0.2
Residents in Specific Age Groups				
5 or Under	7.3	10.4	4.8	9.6
6-9	5.5	7.4	3.7	4.2
10-14	7.8	9.1	4.5	4.2
15-18	7.6	7.1	4.3	3.0
19-24	7.2	13.1	9.2	19.6
25-34	14.4	25.5	16.1	27.6
35-44	14.4	11.6	12.3	8.5
45-54	12.3	6.3	10.8	5.9
55-64	12.7	5.0	15.9	5.9
65 and Older	10.8	4.5	18.3	11.6
Year Home Was Built				
1980 or Later	2.9	1.4	6.1	2.1
1979	4.6	2.3	9.8	3.5
1975-1978	13.3	6.6	22.3	14.2
1970-1974	15.8	10.1	28.8	16.2
1960-1969	23.1	13.3	14.5	13.8
1950-1959	22.4	16.4	8.0	7.5
1940-1949	7.7	12.1	2.2	3.2
Before 1940	7.1	11.9	3.6	4.3
Not Sure	3.2	25.9	4.7	35.4

	Single Family Owners	Single Family Renters	Multi-Family Owners	Multi-Family Renters
Number of Bedrooms				
Studio	0.1	0.9	0.5	3.7
One	1.4	12.9	8.3	36.9
Two	20.0	40.2	48.3	50.0
Three	49.3	33.4	33.3	8.2
Four	24.9	11.4	8.4	0.6
Five	3.7	1.1	1.1	0.1
Six or More	0.6	0.2	0.1	0.4
Square Footage				
Less than 300 Sq Ft.	0.2	1.7	0.1	2.8
300-499 Sq. Ft.	0.4	3.6	0.8	6.5
500-799 Sq. Ft.	1.4	7.4	4.6	14.5
800-1099 Sq. Ft.	8.7	15.3	21.2	15.4
1100-1299 Sq. Ft.	12.1	11.0	18.3	6.0
1300-1599 Sq. Ft.	18.4	9.6	18.5	3.0
1600-1999 Sq. Ft.	21.7	7.4	12.2	1.6
2000-2399 Sq. Ft.	11.6	2.7	4.6	0.4
2400-2999 Sq. Ft.	8.1	0.9	2.3	0.1
3000 Sq. Ft. or more	4.1	0.9	0.9	0.2
Not Sure	13.2	13.2	16.6	49.6
Ceiling Insulation				
None	21.9	59.5	24.0	63.6
Less than R-11	1.2	1.0	1.0	0.6
R-11 thru R-18	3.1	0.3	1.4	0.2
R-19 or Greater	13.6	3.0	8.7	1.7
Don't Know	60.2	36.3	64.9	33.9
Wall Insulation				
Yes	42.3	13.3	38.9	9.0
No	31.4	28.5	19.1	18.9
Not Sure	26.2	58.2	42.0	72.1
Space Heating Fuel				
Electricity	8.5	6.3	31.2	41.9
Natural Gas	85.9	88.3	66.6	53.8
Bottled Gas	2.8	1.7	0.0	0.1
Solar System	0.2	0.0	0.0	0.1
Other	2.3	2.1	0.9	0.4
Don't Know	0.6	1.6	1.3	3.7
Type of Heating System				
Electric Forced Air	2.2	1.0	6.0	3.7
Electric Floor, Ceil	4.1	6.0	19.5	33.4
Electric Heat Pump	2.6	0.3	1.7	0.5
Gas Forced Air	56.5	29.4	42.8	10.8
Gas Wall, Floor	27.6	53.4	19.2	38.5
Other	3.4	3.6	4.3	2.5
None	2.6	4.0	4.5	6.2
Don't Know	1.0	2.2	2.1	4.3

	Single Family Owners	Single Family Renters	Multi-Family Owners	Multi-Family Renters
Type of Air Conditioning System				
Electric Central	10.2	3.0	16.3	7.3
Electric Window, Wall	10.4	7.2	7.4	17.4
Electric Heat Pump	2.4	0.0	1.2	0.2
Evaporative Unit	1.1	1.7	0.3	0.5
Gas Central	2.1	0.8	2.2	0.3
Don't Know	0.7	0.0	0.4	0.8
None	73.1	87.2	72.4	73.3
Black and White TV				
None	71.4	65.6	77.3	68.7
One	24.9	30.9	21.2	29.4
Two	3.2	3.2	1.2	1.7
Three or More	0.5	0.3	0.2	0.4
Total*	32.8	38.2	24.2	34.0
Color TV				
None	6.1	16.4	7.2	24.5
One	64.7	70.3	67.9	70.5
Two	25.7	11.3	22.2	4.5
Three or More	3.4	2.0	2.7	0.5
Total*	126.3	93.5	120.4	81.0
Type of Cooking Range				
None	0.4	1.1	0.5	0.9
Electric	50.3	27.9	67.1	53.4
Natural Gas	46.2	67.7	30.3	44.1
Bottled Gas	1.2	1.8	0.6	0.3
Other	2.0	1.5	1.5	1.4
Microwave Oven	47.7	22.9	35.4	13.1
Type of Refrigerator				
None	1.1	2.7	3.0	4.8
Manual Defrost	11.0	31.0	11.1	50.4
Frost-Free	77.3	62.4	80.8	44.0
Both Manual & Frost-Free	10.6	3.9	5.1	0.8
Freezer Ownership	34.0	11.5	18.1	9.0
Frost-Free Freezer	9.1	2.1	5.7	3.1
Dishwasher	66.3	32.0	74.2	35.6
Washing Machine				
Private Use	94.8	66.9	72.9	16.3
Multi-residence Use	0.4	3.9	18.9	67.2

*Number of Appliances per 100 Customers

	Single Family Owners	Single Family Renters	Multi-Family Owners	Multi-Family Renters
Clothes Dryer				
Electric Private Use	40.6	24.9	40.1	10.7
Natural Gas-Private Use	43.1	24.4	28.0	6.2
Bottled Gas-Private Use	1.0	0.6	0.4	0.1
Central Location	0.5	3.0	18.4	61.8
Not Sure	0.4	0.3	0.6	1.4
Type of Water Heater				
Electric	8.9	8.8	20.7	17.7
Natural Gas	81.7	86.2	71.1	67.8
Bottled Gas	2.0	1.4	0.6	0.5
Solar System	5.7	0.5	1.9	0.0
Central System	0.2	0.2	3.2	10.1
Other	0.8	0.6	0.8	0.3
Don't Know	0.7	2.2	1.7	3.7
Swimming Pool				
Private	14.3	2.9	3.8	1.6
Central	1.7	2.3	48.1	41.8
Jacuzzi*	12.8	2.2	36.6	19.8

*Includes Central-Use Facilities.

Selected Demographic Characteristics and Appliance Saturations for One Person and Five Person or Larger Households

	One Person	Five Person Or Larger
Dwelling Type		
Single Family	33.4	82.2
Townhouse or Row House	9.6	7.3
Duplex-Triplex	8.9	4.7
Low Rise Apt. or Condo	37.2	4.4
High Rise Apt. or Condo	2.1	0.0
Mobile Home	7.7	1.4
Home Ownership		
Own	49.0	77.0
Rent	50.3	22.0
Other	0.7	1.0
Age of Home		
1980 or Later	2.5	2.3
1979	3.1	6.2
1975-1978	10.8	13.6
1970-1974	15.9	20.4
1960-1969	17.5	23.7
1950-1959	12.1	14.3
1940-1949	7.3	3.8
Before 1940	8.4	4.1
Not Sure	22.3	11.5
Number of Bedrooms		
Studio	4.3	0.1
One	37.5	1.0
Two	39.9	10.0
Three	15.5	35.2
Four	2.2	40.9
Five or More	0.7	12.8
Square Footage		
Less than 300 Sq. Ft.	2.5	0.4
300-499	6.1	0.7
500-799	13.6	1.7
800-1099	17.2	5.0
1100-1299	8.2	7.1
1300-1599	8.6	11.6
1600-1999	4.5	17.4
2000-2399	1.6	13.7
2400-2999	19.1	9.5
3000 Sq. Ft or More	11.7	7.0
Not Sure	36.1	25.9

Selected Demographic Characteristics and
Appliance Saturations for One Person Households
And Five person or Larger Households

	One Person	Five Person Or Larger
Annual Household Income		
Less than $2,499	3.9	2.2
$2,500-$4,999	12.2	1.1
$5,000-$7,499	14.5	4.1
$7,500-$9,999	10.1	4.4
$10,000-$12,499	12.1	5.4
$12,500-$14,999	7.6	6.5
$15,000-$19,999	12.7	11.7
$20,000-$24,999	10.9	14.1
$25,000-$29,999	5.4	12.2
$30,000-$34,999	3.8	12.5
$35,000-$39,999	2.2	6.2
$40,000-$44,999	1.5	4.7
$45,000-$49,999	0.7	2.8
$50,000 or more	2.3	12.2
Residents in Specific Age Groups		
5 or Under	0.4	11.8
6-9	0.3	10.8
10-14	0.6	14.6
15-18	0.4	13.7
19-24	5.4	10.8
25-34	19.8	11.5
35-44	11.0	14.7
45-54	10.2	8.7
55-64	14.9	2.6
65 or Older	37.0	1.6
Ceiling Insulation		
None	47.9	24.1
Less than R-11	0.4	1.5
R-11 thru R-18	0.6	2.1
R-19 or Greater	5.5	13.2
Don't Know	45.6	59.2
Wall Insulation		
Yes	18.5	42.3
No	25.7	23.4
Not Sure	55.8	34.4

	One Person	Five Person Or Larger
Type of Heating System		
Electric Forced Air	2.5	2.4
Electric Floor Ceiling	20.2	5.6
Electric Heat Pump	1.0	2.6
Gas Forced Air	23.8	51.6
Gas Wall, Floor	41.0	28.7
Other	3.0	4.1
None	5.7	2.6
Don't Know	2.8	2.4
Type of Air Conditioning System		
Electric Central	9.0	9.4
Electric Window, Wall	12.9	7.1
Electric Heat Pump	0.9	1.7
Evaporative Unit	2.4	1.7
Gas Central	0.9	1.3
Don't Know	0.6	0.5
None	73.1	77.9
Other	0.1	0.3
Black and White T.V.		
None	74.9	62.5
One	24.3	31.4
Two or More	0.8	6.1
Total*		
Color T.V.		
None	21.2	7.5
One	71.8	63.0
Two or More	6.9	29.4
Total*	85.6	121.8
Type of Cooking Range		
Electric	46.4	46.6
Natural Gas	49.3	49.7
Bottled Gas	1.3	0.6
Other	1.9	2.5
Microwave Oven	16.9	45.8
Type of Refrigerator		
None	4.8	2.8
Manual Defrost	39.5	14.0
Frost Free	53.3	74.6
Both Manual & Frost Free	2.4	8.5

*Number of Appliances Per 100 Customers

	One Person	Five Person Or Larger
Frost-Free Refrigerators		
One	54.5	76.6
Two	1.3	6.9
Three or more	0.1	0.1
Total*	57.4	90.7
Freezer	12.1	39.2
Frost-Free Freezer	3.7	10.4
Dishwasher	35.5	64.2
Washing Machine		
Private Use	39.6	88.5
Multi-Residence Use	42.3	4.7
Clothes Dryer		
Electric-Private Use	18.0	35.8
Natural Gas-Private Use	13.8	42.0
Bottled Gas-Private Use	0.6	0.5
Multi-Residence Use	39.6	4.4
Not Sure	1.3	0.5
Type of Water Heater		
Electric	7.5	10.0
Natural Gas	5.5	77.6
Bottled Gas	0.7	1.2
Solar System	0.7	5.6
Central System	32.6	3.8
Don't Know	3.0	0.9
Other	0.2	0.8
Swimming Pool		
Private	2.2	15.2
Central	32.7	4.6
Jacuzzi**	19.0	14.2

*Number of Appliances Per 100 Customers
**Includes Central Use Facilities

Selected Demographic Characteristics and Appliance Saturations for Low and High Income Households

	Less Than $12,500	$40,000 or More
Dwelling Type		
Single Family	40.6	78.8
Townhouse	7.2	8.8
Duplex-Triplex	10.8	2.7
Low Rise Apt. or Condo	30.9	6.9
High Rise Apt. or Condo	1.3	1.1
Mobile Home	9.2	1.7
Home Ownership		
Own	44.6	90.5
Rent	54.6	9.1
Other	0.8	0.3
Age of Home		
1980 or Later	1.5	6.4
1979	1.8	7.8
1975-1978	8.4	20.9
1970-1974	13.8	19.6
1960-1969	17.2	22.4
1950-1959	14.5	12.7
1940-1949	8.3	3.0
Before 1940	9.6	4.3
Not Sure	25.0	2.8
Number of Bedrooms		
Studio	2.6	0.1
One	26.0	2.0
Two	47.9	19.5
Three	18.6	39.7
Four	4.5	31.3
Five	0.3	5.7
Six or More	0.2	1.7
Square Footage		
Less than 300 Sq. Ft.	2.8	0.0
300-499 Sq. Ft.	5.4	0.3
500-799 Sq. Ft.	11.0	1.5
800-1099 Sq. Ft.	13.8	4.8
1100-1299 Sq. Ft.	8.1	6.8
1300-1599 Sq. Ft.	8.5	13.0
1600-1999 Sq. Ft.	3.5	23.9
2000-2399 Sq. Ft.	1.0	18.1
2400-2999 Sq. Ft.	0.7	15.5
3000 Sq. Ft. or more	0.3	11.0
Not Sure	44.9	5.1

	Less Than $12,500	$40,000 or More
Number of Residents		
One	37.6	6.3
Two	34.6	41.5
Three or Four	21.3	37.9
Five or Six	4.8	11.7
Seven or Eight	1.0	2.1
Nine or More	0.5	0.5
Residents in Specific Age Groups		
5 or Under	9.0	5.9
6-9	5.0	3.9
10-14	5.1	7.4
15-18	4.4	8.1
19-24	13.3	8.9
25-34	16.1	14.0
35-44	6.1	17.2
45-54	5.8	14.8
55-64	10.9	14.0
65 or Older	24.4	5.8
Ceiling Insulation		
None	49.8	17.2
Less than R-1L	1.0	0.8
R-11 thru R-18	0.9	3.8
R-19 or Greater	5.3	13.5
Don't Know	42.9	64.6
Wall Insulation		
Yes	18.3	49.5
No	31.7	17.8
Not Sure	49.9	32.7
Space Heating Fuel		
Electricity	17.6	15.9
Natural Gas	76.4	78.6
Bottled Gas	1.3	3.4
Solar System	0.1	0.4
Other	1.7	0.9
Don't Know	2.9	0.7

	Less Than $12,500	$40,000 or More
Type of Heating System		
Electric Forced Air	1.5	3.8
Electric Floor, Ceiling	14.6	7.5
Electric Heat Pump	0.5	4.4
Gas Forced Air	22.3	66.7
Gas Wall, Floor	48.1	12.5
Other	3.6	2.1
None	6.3	1.4
Don't Know	3.1	1.6
Type of Air Conditioning System		
Electric Central	6.3	16.0
Electric Window, Wall	13.3	4.9
Electric Heat Pump	0.3	3.8
Evaporative Unit	3.0	0.9
Gas Central	0.9	2.7
Don't Know	0.6	0.7
None	75.5	70.5
Other	0.1	0.5
Black and White T.V.		
None	66.9	72.6
One	31.0	24.2
Two or More	2.1	3.2
Total*	35.2	30.6
Color T.V.		
None	21.7	3.3
One	68.6	54.3
Two or More	9.7	42.4
Total*	88.0	139.1
Type of Cooking Range		
Electric	34.0	69.7
Natural Gas	60.7	26.9
Bottled Gas	2.0	0.8
Other	2.4	2.2
Microwave Oven	13.6	59.0
Type of Refrigerator		
None	5.1	0.9
Manual Defrost	38.5	8.3
Frost-Free	51.6	81.0
Both Manual & Frost-Free	4.8	9.8
Frost-Free Refrigerators		
One	54.7	79.6
Two	2.2	11.5
Three or More	0.0	0.3
Total*	59.1	103.5

*Number of Appliances Per 100 Customers

	Less Than $12,500	$40,000 or More
Freezer	19.0	35.2
Frost Free Freezer	4.9	10.0
Dishwasher	25.4	88.9
Washing Machine		
Private Use	45.9	90.8
Multi-Residence Use	37.5	6.5
Clothes Dryer		
Electric-Private Use	23.7	43.7
Natural Gas - Private Use	21.9	35.6
Bottled Gas - Private Use	0.7	1.3
Multi-Residence Use	28.4	9.6
Type of Water Heater		
Electric	9.3	9.6
Natural Gas	62.8	69.5
Bottled Gas	1.8	2.1
Solar System	1.6	6.7
Central System	21.3	9.6
Don't Know	2.3	1.7
Other	0.4	0.7
Swimming Pool		
Private	2.6	20.3
Central	22.9	16.3
Jacuzzi*	12.0	32.7

*Includes Central Use Facilities

Selected Demographic Characteristics and Appliance Saturations by Family Type

	Young Adults (266)	Young Families (951)	Established Adults (2396)	Established Families (1608)	Senior Citizens (1502)
Dwelling Type					
Single Family	19.2	59.8	53.8	81.9	50.3
Townhouse	11.3	8.3	10.2	6.8	6.4
Duplex-Triplex	7.2	10.7	6.9	3.1	7.3
Low-Rise Apt or Condo	61.1	19.6	24.1	7.1	18.9
High-Rise Apt. or Condo	0.4	0.1	0.8	0.1	1.9
Mobile Home	0.8	1.5	4.2	1.1	15.2
Home Ownership					
Own	13.6	49.0	64.8	81.9	75.4
Rent	85.6	49.9	34.6	17.6	24.0
Other	0.8	1.1	0.6	0.5	0.6
Age of Home					
1980 or Later	4.5	2.4	3.4	2.4	1.6
1979	4.5	6.5	5.2	5.3	1.7
1975-1978	17.3	16.8	14.7	15.5	10.3
1970-1974	12.8	16.8	16.7	19.0	19.8
1960-1969	11.3	14.7	19.0	22.8	20.7
1950-1959	11.3	13.6	16.6	16.9	16.6
1940-1949	3.4	5.7	5.5	4.8	9.3
Before 1940	4.1	4.1	6.2	4.5	9.4
Not Sure	30.8	19.3	12.8	8.8	10.6
Number of Bedrooms					
Studio	3.8	0.2	1.7	0.3	1.7
One	41.7	5.7	17.7	1.8	17.3
Two	36.1	39.2	36.6	15.7	52.8
Three	13.9	39.8	34.2	42.6	23.7
Four	3.8	14.2	8.9	32.5	4.1
Five	0.0	0.9	0.9	6.2	0.2
Six or More	0.8	0.0	0.1	0.9	0.1
Square Footage					
Less than 300 Sq. Ft.	4.2	1.1	1.1	0.3	1.5
300-499 Sq. Ft.	8.1	1.5	3.6	0.8	2.1
500-799 Sq. Ft.	11.6	4.7	8.1	2.1	8.4
800-1099 Sq. Ft.	10.8	12.9	14.5	5.8	17.5
1100-1299 Sq. Ft.	8.5	13.1	12.8	8.7	12.2
1300-1599 Sq. Ft.	5.8	14.7	15.0	14.3	16.4
1600-1999 Sq. Ft.	3.9	12.5	12.8	20.4	9.7
2000-2399 Sq. Ft.	1.5	3.3	6.3	13.8	2.8
2400-2999 Sq. Ft.	0.8	3.0	3.3	9.6	2.6
3000 Sq. Ft or More	0.8	0.7	2.0	4.7	1.1
Not Sure	44.0	32.6	20.4	19.4	25.8

	Young Adults (266)	Young Families (951)	Established Adults (2396)	Established Families (1608)	Senior Citizens (1502)
Annual Household Income					
Less than $2,499	6.5	2.4	1.3	1.4	2.8
$2,500-$4,999	4.2	4.3	2.7	1.1	10.1
$5,000-$7,499	11.7	6.8	4.6	3.2	14.3
$7,500-$9,999	11.7	6.6	5.0	3.5	12.4
$10,000-$12,499	10.3	11.0	7.5	4.9	15.5
$12,500-$14,999	11.0	5.9	7.2	5.5	7.1
$15,000-$19,999	15.9	15.7	13.5	10.3	11.7
$20,000-$24,999	13.6	16.9	14.6	13.2	7.8
$25,000-$29,999	3.7	11.6	10.1	12.5	5.6
$30,000-$34,999	2.3	8.9	8.6	13.2	3.8
$35,000-$39,999	3.3	4.0	7.0	8.8	2.0
$40,000-$44,999	0.5	2.2	5.1	6.2	1.8
$45,000-$49,999	0.9	1.0	3.1	3.6	0.7
$50,000 or More	1.4	2.6	9.7	12.4	4.3
Number of Residents					
One	28.4	0.3	34.6	0.1	37.2
Two	57.2	8.3	60.6	10.2	60.0
Three or Four	12.9	77.0	4.5	63.8	2.7
Five or Six	1.5	13.1	0.1	21.6	0.0
Seven or Eight	0.0	1.1	0.0	2.9	0.0
Nine or More	0.0	0.0	0.0	1.2	0.0
Space Heating Fuel					
Electricity	37.7	18.3	21.8	11.9	15.2
Natural Gas	53.3	75.5	73.9	82.3	80.2
Bottled Gas	1.4	1.5	1.8	2.8	2.6
Solar System	0.0	0.1	0.2	0.1	0.2
Other	0.5	2.0	1.4	1.8	1.0
Don't Know	7.1	2.6	0.8	1.2	0.9
Type of Heating System					
Electric Forced Air	3.8	4.2	3.0	2.8	1.6
Electric Floor, Ceiling	30.8	12.7	15.7	7.1	10.6
Electric Heat Pump	0.5	1.6	1.6	1.9	2.4
Gas Forced Air	14.2	37.3	39.2	57.1	37.8
Gas Wall, Floor	36.5	36.0	31.7	24.6	38.2
Other	1.4	3.3	3.0	2.8	3.3
None	5.7	2.1	3.9	2.5	5.2
Don't Know	7.1	2.7	2.0	1.4	0.9

	Young Adults (266)	Young Families (951)	Established Adults (2396)	Established Families (1608)	Senior Citizens (1502)
Type of Air Conditioning					
Electric Central	8.5	5.9	10.5	10.0	13.8
Electric Window, Wall	19.1	10.7	11.5	9.6	12.7
Electric Heat Pump	0.0	1.2	1.4	1.5	2.2
Evaporative Unit	0.8	1.3	1.8	1.3	4.0
Gas Central	0.0	1.2	1.5	2.2	2.0
Don't Know	0.4	0.9	0.5	0.4	0.6
None	70.7	78.6	72.9	74.6	64.4
Other	0.4	0.2	0.1	0.3	0.5
Ceiling Insulation					
None	52.5	35.5	29.9	23.1	31.8
Less than R-11	0.0	1.3	1.0	1.5	0.9
R-11 thru R-18	2.0	2.1	2.1	3.0	1.8
R-19 or Greater	6.1	10.9	11.4	12.8	7.9
Don't Know	39.4	50.2	55.6	59.6	57.5
Wall Insulation					
Yes	14.0	27.7	30.9	41.7	33.1
No	15.5	22.6	24.6	24.4	32.8
Don't Know	70.6	49.6	44.5	33.9	34.1
Black and White T.V.					
None	58.2	69.7	76.7	61.5	77.8
One	38.7	28.3	21.8	32.5	20.9
Two or More	3.1	2.0	1.6	5.9	1.3
Total**	44.9	32.3	25.0	44.3	23.5
Color T.V.					
None	39.7	13.6	12.7	6.0	9.6
One	55.3	74.6	69.8	62.7	70.7
Two or More	5.0	11.9	17.4	31.4	19.7
Total**	65.3	98.4	104.6	125.5	110.1
Type of Cooking Range					
Electric	53.8	40.7	51.4	51.7	47.5
Natural Gas	42.7	55.5	44.9	44.5	49.1
Bottled Gas	1.1	1.6	1.0	1.3	1.9
Other	1.5	1.7	1.8	2.2	1.2
Microwave Oven	16.5	35.5	36.4	48.3	18.7

**Number of Appliances Per 100 Customers

	Young Adults (266)	Young Families (951)	Estab-lished Adults (2396)	Estab-lished Families (1608)	Senior Citizens (1502)
Type of Refrigerator					
None	2.7	2.7	2.0	1.2	3.5
Manual Defrost	48.2	25.9	25.9	13.9	23.6
Frost-Free	48.6	68.9	65.2	75.6	65.6
Both Manual & Frost-Free	0.4	2.5	6.9	9.2	7.4
Frost-Free Refrigerators					
One	49.0	69.7	68.0	78.1	69.0
Two	0.8	2.3	4.2	7.4	4.3
Three or More	0.0	0.0	0.2	0.1	0.3
Total*	50.6	74.3	77.0	93.2	78.5
Freezer	8.3	18.1	22.0	38.5	27.5
Frost-Free Freezer	3.4	4.7	5.5	10.4	6.2
Dishwasher	44.0	49.3	56.9	70.2	44.6
Washing Machine					
Private Use	17.4	70.3	63.3	88.0	64.5
Multi-Residence	64.2	21.1	24.0	6.6	26.0
Clothes-Dryer					
Electric-Private Use	9.3	29.8	30.1	38.9	29.2
Natural Gas-Private Use	8.1	31.4	27.6	41.9	22.4
Bottled Gas-Private Use	0.0	0.7	0.7	0.7	0.6
Multi-Residence	63.0	20.8	23.3	6.7	25.0
Type of Water Heater					
Electric	5.3	10.2	9.8	9.4	9.1
Natural Gas	35.0	64.5	62.8	75.5	68.2
Bottled Gas	0.4	1.9	1.4	2.1	1.7
Solar System	0.8	2.3	2.5	5.0	2.7
Central System	54.9	17.4	20.8	6.0	15.9
Don't Know	3.2	2.7	2.0	1.1	1.4
Other	0.4	0.7	0.5	0.8	0.5
Swimming Pool					
Private	3.0	6.7	7.1	16.1	3.0
Central	46.4	15.2	25.1	7.8	24.6
Jacuzzi**	22.5	10.3	20.3	16.0	18.7

*Number of Appliances Per 100 Customers
**Includes Central-Use Facilities

Selected Demographic Characteristics and Appliance Saturations for Geographic Area

	Maritime	Coastal	Inland
Dwelling Type			
Single Family	55.8	70.0	65.1
Townhouse or Row House	6.7	6.9	5.4
Duplex-Triplex	8.2	6.1	2.4
Low Rise Apt or Condo	23.0	13.3	15.4
High Rise Apt or Condo	1.9	0.3	0.0
Mobile Home	4.4	3.3	11.8
Home Ownership			
Own	58.2	74.3	76.6
Rent	40.8	25.4	22.7
Other	1.0	0.3	0.7
Age of Home			
1980 or Later	0.7	0.6	0.4
1979	1.3	2.7	2.2
1975-1978	6.4	12.0	15.3
1970-1974	10.8	17.1	27.7
1960-1969	18.9	23.1	23.0
1950-1959	18.0	22.7	14.7
1940-1949	11.1	6.3	3.8
Before 1940	15.4	4.3	2.8
Not Sure	17.3	11.1	10.2
Number of Bedrooms			
Studio	1.8	0.6	0.6
One	19.1	9.1	7.7
Two	37.5	29.6	34.7
Three	29.4	40.0	36.9
Four	9.2	18.1	17.7
Five or More	3.0	2.6	2.3
Square Footage			
Less than 300 Sq Ft	1.8	0.5	0.6
300-499	4.0	2.0	1.1
500-799	8.6	5.2	4.9
800-1099	14.8	11.6	10.9
1100-1299	10.0	13.3	10.9
1300-1599	9.9	14.6	19.7
1600-1999	8.9	15.4	15.0
2000-2399	4.9	7.6	7.5
2400-2999	3.9	3.7	4.9
3000 Sq Ft or More	2.6	1.4	3.3
Not Sure	30.7	24.6	21.2

	Maritime	Coastal	Inland
Annual Household Income			
Less than $2,499	2.5	2.6	1.5
$2,500-$4,999	6.9	3.7	3.3
$5,000-$7,499	9.0	5.6	6.6
$7,500-$9,999	7.5	7.1	5.1
$10,000-$12,499	10.6	8.0	9.5
$12,500-$14,999	9.0	6.3	7.1
$15,000-$19,999	13.0	14.0	13.3
$20,000-$24,999	12.4	15.2	13.7
$25,000-$29,999	7.1	10.7	10.3
$30,000-$34,999	6.5	8.9	10.4
$35,000-$39,999	3.4	5.8	6.6
$40,000-$44,999	3.6	4.2	3.8
$45,000-$49,999	2.3	1.7	1.7
$50,000 or More	6.2	6.1	7.0
Residents In Specific Age Groups			
5 or Under	6.8	7.0	8.6
6-9	4.7	5.1	5.2
10-14	5.6	7.7	7.2
15-18	5.3	6.5	7.0
19-24	10.0	9.8	8.5
25-34	17.4	16.3	16.6
35-44	11.1	12.5	12.5
45-54	10.3	11.7	10.6
55-64	12.5	11.4	10.7
65 or Older	16.3	12.0	13.1
Ceiling Insulation			
None	48.0	29.2	17.0
Less than R-11	0.6	1.2	1.8
R-11 thru R-18	2.4	2.2	2.5
R-19 or Greater	7.4	10.5	11.9
Don't Know	41.6	56.9	66.8
Wall Insulation			
Yes	22.0	29.6	44.1
No	34.7	31.0	19.8
Not Sure	43.3	39.4	36.1
Type of Heating System			
Electric Forced Air	0.9	2.0	4.9
Electric Floor Ceiling	11.3	9.6	11.2
Electric Heat Pump	0.1	0.6	3.6
Gas Forced Air	31.4	45.2	49.9
Gas Wall, Floor	45.1	34.7	22.8
Other	2.9	2.6	3.9
None	6.0	3.5	2.0
Don't Know	2.2	1.7	1.7

	Maritime	Coastal	Inland
Type of Air Conditioning System			
Electric Central	1.7	8.1	24.6
Electric Window, Wall	4.7	13.0	23.6
Electric Heat Pump	0.1	0.5	2.8
Evaporative Unit	1.0	1.3	4.6
Gas Central	0.6	1.3	3.5
Other	0.0	0.2	0.6
None	91.7	75.2	38.9
Don't Know	0.2	0.4	1.3
Black and White T.V.			
None	68.7	69.8	76.1
One	27.9	26.9	21.4
Two or More	3.4	3.3	2.5
Total*	34.7	33.5	26.4
Color T.V.			
None	13.9	9.9	7.8
One	67.2	67.3	70.9
Two or More	18.9	22.7	21.3
Total*	105.0	112.7	113.5
Type of Cooking Range			
Electric	35.5	45.7	53.5
Natural Gas	60.9	51.4	41.9
Bottled Gas	0.5	0.7	3.1
Other	3.1	2.2	1.5
Microwave Oven	25.0	36.9	41.3
Type of Refrigerator			
None	3.3	2.2	2.1
Manual Defrost	28.9	20.4	19.7
Frost-Free	60.3	69.7	70.6
Both Manual & Frost-Free	7.5	7.7	7.6
Frost-Free Refrigerators			
One	64.2	73.2	71.9
Two	3.9	4.8	6.4
Three or More	0.1	0.3	0.4
Total*	72.3	83.3	85.9
Freezer	19.5	26.6	33.2
Frost-Free Freezer	5.7	7.2	8.3
Dishwasher	40.8	53.5	60.7
Washing Machine			
Private Use	58.6	75.9	76.3
Multi-Residence Use	26.4	15.1	19.1

*Number of Appliances Per 100 Customers

	Maritime	Coastal	Inland
Clothes Dryer			
Electric-Private Use	27.6	36.4	47.2
Natural Gas-Private Use	33.7	38.9	35.8
Bottled Gas-Private Use	0.0	0.2	1.7
Central Location	4.8	2.4	2.5
Type of Water Heater			
Electric	5.8	8.0	16.4
Natural Gas	86.8	84.6	70.9
Bottled Gas	0.1	0.8	4.3
Solar System	2.0	3.4	5.5
Central System	3.3	1.3	1.3
Other	0.7	0.7	0.6
Don't Know	1.5	1.3	1.0
Swimming Pool			
Private	5.1	9.7	15.2
Central	14.1	13.9	21.7
Jacuzzi*	10.5	15.1	17.7

*Includes Central Use Facilities.

CHAPTER 10

Selected Demographic Characteristics And
Appliance Saturations by SDG&E Service Center

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Dwelling Type							
Single Family	63.2	57.5	65.9	61.9	67.4	63.4	60.3
Townhouse or Row House	11.0	6.4	5.8	8.6	6.5	12.6	9.1
Duplex-Triplex	5.2	9.5	3.3	9.5	3.6	9.3	6.2
Low-Rise Apt or Condo	18.9	24.2	15.6	11.7	12.8	9.8	14.9
High Rise Apt or Condo	1.4	1.4	0.4	0.2	0.0	0.3	1.3
Mobile Home	0.4	1.0	9.1	8.1	9.8	4.6	8.3
Home Ownership							
Own	69.8	53.3	76.7	78.7	81.2	81.8	69.7
Rent	29.6	46.0	23.1	20.7	17.5	17.4	29.1
Other	0.6	0.6	0.2	0.6	1.3	0.8	1.2
Age of Home							
1980 or Later	1.5	1.9	2.2	4.2	4.4	4.7	2.4
1979	2.8	2.5	4.6	7.1	6.7	5.8	5.4
1975-1978	10.5	4.9	12.8	25.0	24.6	17.9	11.5
1970-1974	17.3	8.5	20.0	18.5	27.4	27.8	13.1
1960-1969	22.5	11.5	21.4	21.0	19.3	26.2	22.0
1950-1959	23.0	17.3	20.9	10.9	6.5	8.3	19.0
1940-1949	7.8	11.0	6.0	3.5	1.6	2.2	6.4
Before 1940	4.0	20.2	2.9	3.4	2.8	2.2	7.2
Not Sure	10.6	22.3	9.2	6.3	6.7	5.0	13.0
Number of Bedrooms							
Studio	1.6	1.5	0.5	0.8	0.4	0.8	0.8
One	11.1	22.5	8.8	8.0	6.5	3.0	10.1
Two	26.9	42.5	31.0	37.5	32.1	37.4	30.9
Three	38.0	23.8	41.8	37.2	35.1	36.0	38.7
Four	18.2	8.2	15.9	14.0	23.0	19.8	16.5
Five or More	4.2	1.5	1.9	2.6	2.9	3.0	3.0

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Square Footage							
Less than 300 Sq Ft	0.3	2.4	0.2	1.0	0.5	0.3	1.1
300-499 Sq Ft	2.3	5.0	1.7	1.0	0.4	1.1	2.3
500-799 Sq Ft	5.7	9.8	4.8	3.7	4.5	1.4	6.6
800-1099 Sq Ft	12.3	13.6	11.4	15.0	9.3	7.9	12.2
1100-1299 Sq Ft	12.6	8.3	13.4	12.3	10.4	11.0	11.6
1300-1599 Sq Ft	15.2	8.4	17.6	15.8	20.5	22.0	11.7
1600-1999 Sq Ft	13.8	6.7	15.8	17.4	20.3	22.3	11.9
2000-2399 Sq Ft	8.8	2.9	7.5	8.0	10.0	10.1	5.7
2400-2999 Sq Ft	6.2	1.7	4.3	5.9	6.3	9.6	3.6
3000 Sq Ft or More	2.6	0.9	2.4	2.8	3.4	4.2	1.6
Not Sure	20.1	40.2	20.8	16.9	14.5	10.1	31.7
Annual Household Income							
Less than $2,499	1.1	5.7	1.7	1.2	1.4	0.7	2.1
$2,500 - $4,999	2.4	10.1	2.9	2.3	2.3	2.1	6.2
$5,000 - $7,499	3.8	10.8	5.1	5.7	5.3	1.4	8.3
$7,500 - $9,999	3.7	12.3	5.2	7.1	4.8	3.2	6.1
$10,000 - $12,499	7.6	9.3	8.8	9.4	8.3	5.3	11.1
$12,500 - $14,999	5.2	8.0	7.9	7.1	5.3	4.6	9.5
$15,000 - $19,999	13.7	12.7	14.4	10.6	11.0	8.1	13.6
$20,000 - $24,999	14.0	11.1	14.1	12.9	14.8	9.5	16.3
$25,000 - $29,999	11.3	6.1	11.4	9.2	11.7	12.4	8.0
$30,000 - $34,999	10.2	5.2	9.8	9.1	11.1	12.4	6.7
$35,000 - $39,999	7.4	3.3	6.3	5.9	7.8	6.4	3.3
$40,000 - $44,999	5.4	2.1	4.2	5.4	4.8	6.4	3.7
$45,000 - $49,999	3.1	0.8	2.2	3.2	2.8	7.1	1.8
$50,000 or More	11.3	2.5	6.3	10.9	8.7	20.5	3.4

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Residents in Specific Age Groups							
5 or Under	5.9	7.2	7.4	7.7	8.4	7.2	9.1
6-9	4.0	5.2	4.8	5.4	6.0	4.8	6.0
10-14	6.6	6.5	7.4	6.5	8.8	7.8	7.2
15-18	6.7	4.8	6.8	6.7	6.4	6.5	6.5
19-24	11.2	10.4	10.1	8.1	6.2	6.0	9.5
25-34	17.9	19.6	16.4	6.7	15.8	14.4	17.1
35-44	13.3	9.8	13.5	13.7	13.6	15.5	10.9
45-54	12.5	8.9	11.1	12.8	8.4	10.6	10.9
55-64	11.3	12.0	11.7	14.3	11.1	13.3	10.9
65 or Older	10.5	15.6	10.9	18.1	15.3	13.8	11.9
Ceiling Insulation							
None	34.5	52.6	21.0	22.6	10.3	22.0	32.6
Less than R-11	0.9	0.3	1.4	1.2	2.3	1.1	1.5
R-11 thru R-18	2.3	1.6	2.8	2.5	2.3	2.8	3.0
R-19 or Greater	8.9	6.6	12.7	12.2	15.1	10.6	8.9
Don't Know	53.5	38.9	62.1	61.5	69.9	63.5	54.1
Wall Insulation							
Yes	28.3	18.5	37.7	40.9	51.7	40.7	31.1
No	28.5	38.2	25.2	21.6	15.3	19.8	30.2
Not Sure	43.2	43.3	37.2	37.5	32.9	39.6	38.7
Type of Heating System							
Electric Forced Air	2.0	1.3	3.7	1.7	6.5	2.0	1.5
Electric Floor Ceiling	12.0	10.1	10.9	12.2	10.0	2.3	11.1
Electric Heat Pump	0.2	0.3	1.8	3.0	8.5	0.3	0.3
Gas Forced Air	47.7	23.6	49.5	48.1	52.4	69.3	36.8

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Type of Heating System (Cont.)							
Gas, Wall, Floor	29.7	54.3	26.3	24.7	15.3	21.3	41.2
Other	2.6	2.8	4.2	3.9	3.1	2.0	2.4
None	3.8	6.0	1.8	4.6	2.6	2.0	4.5
Don't Know	2.1	1.7	1.9	1.7	1.5	0.6	2.4
Type of Air Conditioning System							
Electric Central	4.2	4.0	22.1	4.7	22.9	12.5	3.2
Electric Window-Wall	6.9	12.3	23.3	5.3	12.4	0.9	5.4
Electric Heat Pump	0.2	0.3	1.5	2.1	7.3	0.0	0.2
Evaporative Unit	0.3	1.1	4.4	1.6	3.3	0.0	1.7
Gas Central	0.7	1.0	3.6	1.2	2.3	3.4	0.6
Other	0.0	0.1	0.5	0.2	0.6	0.0	0.0
None	87.3	81.0	43.4	84.7	50.3	83.2	88.3
Don't Know	0.2	0.3	1.2	0.2	1.0	0.0	0.5
Black and White T.V.							
None	67.4	68.7	74.5	73.0	75.6	76.0	70.0
One	28.6	28.9	23.2	24.9	21.6	21.0	26.0
Two or More	4.0	2.5	2.3	2.1	2.7	3.0	3.9
Total*	36.6	33.9	27.8	29.1	27.0	27.0	33.8
Color T.V.							
None	11.9	17.6	7.7	8.9	6.9	6.7	7.6
One	63.8	66.8	70.7	67.6	71.5	64.4	68.6
Two or More	24.3	15.6	21.6	23.4	21.5	29.1	23.9
Total*	24.3	15.6	21.6	23.4	21.5	29.1	23.9
	112.4	98.0	113.9	114.4	114.5	122.6	116.4

*Number of Appliances Per 100 Customers

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Type of Cooking Range							
Electric	56.8	28.0	50.2	50.1	62.6	47.7	38.5
Natural Gas	40.9	68.4	45.4	46.9	31.8	51.2	57.8
Bottled Gas	0.1	0.3	2.3	1.2	3.8	0.0	0.9
Other	1.8	2.7	1.7	1.5	1.3	1.1	2.3
Microwave Oven	35.9	19.9	43.2	38.7	44.2	40.2	32.5
Type of Refrigerator							
None	1.7	5.3	1.9	1.7	1.3	1.9	2.6
Manual Defrost	19.2	36.9	19.3	15.9	14.8	12.9	23.2
Frost-Free	72.1	52.9	69.4	74.7	76.2	79.7	66.9
Both Manual & Frost-Free	7.0	5.0	9.3	7.7	7.6	5.5	7.3
Frost-Free Refrigerator							
One	75.2	55.2	74.9	75.7	75.7	79.0	70.1
Two	4.2	2.8	4.3	6.8	8.2	6.6	4.9
Three or More	0.1	0.3	0.2	0.2	0.4	0.0	0.1
Total*	83.9	61.7	84.1	89.9	93.3	92.2	80.2
Freezer	21.0	18.8	29.5	29.6	30.9	22.7	25.2
Frost-Free Freezer	6.7	5.1	7.0	8.5	7.9	6.5	6.9
Dishwasher	62.0	28.7	58.5	64.0	73.4	79.0	46.8
Washing Machine							
Private Use	72.0	55.3	75.4	78.4	83.2	83.2	70.6
Multi-Residence	18.4	24.7	19.1	14.3	12.4	10.2	21.1

*Number of Appliances Per 100 Customers

	Beach Cities	Centre City	Eastern	North Coast	North East	Orange County	South Bay
Clothes Dryer							
Electric-Private Use	33.8	16.5	31.9	40.6	48.0	25.8	28.7
Natural Gas-Private Use	31.9	23.5	36.1	30.1	25.6	54.1	30.1
Bottled Gas-Private Use	0.0	0.1	1.0	1.5	2.0	0.3	0.0
Central Location	18.0	23.0	18.6	14.1	12.5	10.3	20.7
Not Sure	15.4	0.9	0.7	0.8	0.4	0.5	0.4
Type of Water Heater							
Electric	7.6	4.7	12.5	14.5	19.6	4.6	6.4
Natural Gas	83.6	89.5	76.7	73.5	64.1	93.3	88.7
Bottled Gas	0.2	0.1	3.0	2.3	5.1	0.0	0.1
Solar System	3.0	1.3	4.5	6.4	8.3	0.9	1.8
Central System	3.1	1.7	2.0	1.3	0.9	0.0	1.6
Other	1.3	0.4	0.4	1.0	0.7	0.3	0.4
Don't Know	1.2	2.4	1.0	0.9	1.2	0.9	1.0
Swimming Pool							
Private	9.9	3.4	13.9	8.1	12.2	6.7	6.2
Central	20.9	6.5	22.2	20.1	16.7	22.0	17.9
Jacuzzi*	19.9	5.4	19.3	25.9	20.4	24.5	10.5

*Includes Central Use Facilities

Selected Demographic Characteristics And Appliance Saturations for Consumption Levels

	Low Consumption (0-400 Kwhrs)	Medium Consumption (401-700 Kwhrs)	High Consumption (701 + Kwhrs)
Dwelling Type			
Single Family	50.8	65.4	67.7
Townhouse or Row House	6.8	8.2	13.2
Duplex-Triplex	6.8	6.7	5.4
Low Rise Apt. or Condo	23.9	17.8	10.8
High Rise Apt. or Condo	1.1	0.7	0.4
Mobile Home	10.7	1.2	2.4
Home Ownership			
Own	57.9	70.0	81.5
Rent	41.2	29.5	17.7
Other	0.9	0.6	0.8
Age of Home			
1980 or Later	2.9	2.9	2.5
1979	4.0	4.9	5.4
1975 - 1978	11.3	16.2	15.9
1970 - 1974	15.0	17.9	25.0
1960 - 1969	17.0	19.9	24.6
1950 - 1959	16.8	16.1	12.4
1940 - 1949	7.2	5.4	4.5
Before 1940	8.2	5.3	3.9
Not Sure	17.6	11.3	5.8
Number of Bedrooms			
Studio	2.2	0.4	0.4
One	22.1	7.4	1.9
Two	40.7	32.5	23.8
Three	27.5	39.0	38.5
Four	6.7	18.4	27.3
Five	0.6	2.0	6.7
Six or More	0.2	0.3	1.5
Square Footage			
Less than 300 sq. ft.	1.9	0.6	0.3
300 - 499	4.5	1.2	0.7
500 - 799	9.9	4.5	1.1
800 - 1099	15.6	11.4	6.0
1100 - 1299	11.9	11.5	8.9
1300 - 1599	13.7	15.8	13.2
1600 - 1999	8.2	17.2	18.9
2000 - 2399	2.3	17.2	16.4
2400 - 2999	1.0	7.7	11.2
3000 sq. ft. or more	0.8	1.5	9.4
Not Sure	30.3	22.9	14.0

	Low Consumption	Medium Consumption	High Consumption
Annual Household Income			
Less than $2,499	3.1	1.8	0.8
$2,500 - $4,999	7.0	2.7	1.0
$5,000 - $7,499	10.0	5.0	1.7
$7,000 - $9,999	9.1	5.3	2.3
$10,000 - $12,499	11.7	8.0	4.1
$12,500 - $14,999	7.6	7.1	4.0
$15,000 - $19,999	14.9	12.4	8.9
$20,000 - $24,999	12.8	14.6	11.3
$25,000 - $29,999	8.5	10.7	10.3
$30,000 - $34,999	5.8	10.4	10.8
$35,000 - $39,999	3.5	6.9	8.0
$40,000 - $44,999	2.3	4.8	6.9
$45,000 - $49,999	0.8	3.0	4.7
$50,000 or more	2.9	7.2	25.2
Residents in Specific Age Groups			
5 or under	8.1	8.6	6.1
6 - 9	4.8	6.6	6.1
10 - 14	4.2	7.8	9.9
15 - 18	3.1	7.0	10.8
19 - 24	10.2	9.6	11.0
25 - 34	21.0	16.1	10.5
35 - 44	9.7	13.1	15.7
45 - 54	8.2	10.4	13.0
55 - 64	12.0	10.8	9.9
65 or older	18.6	10.1	6.9
Ceiling Insulation			
None	37.9	26.7	19.8
Less Than R-11	1.0	1.3	1.3
R-11 thru R-18	1.4	2.7	3.0
R-19 or Greater	8.7	11.4	11.4
Don't Know	51.1	57.9	64.5
Wall Insulation			
Yes	27.0	34.0	43.5
No	27.6	26.2	20.0
Not Sure	45.4	39.8	36.5
Type of Heating System			
Electric Forced Air	1.7	3.0	5.2
Electric Floor Ceiling	12.5	11.8	12.9
Electric Heat Pump	0.9	2.0	3.3
Gas Forced Air	33.5	46.1	54.8
Gas Wall, Floor	41.4	28.6	14.9
Other	2.8	3.4	4.2
None	4.6	3.5	3.1
Don't Know	2.6	1.6	1.8

	Low Consumption	Medium Consumption	High Consumption
Type of Air Conditioning System			
Electric Central	7.4	9.9	19.8
Electric Window, wall	11.9	11.5	8.9
Electric Heat Pump	0.7	1.5	3.0
Evaporative Unit	3.5	0.9	1.1
Gas Central	0.9	1.5	3.4
Other	0.3	0.1	0.4
None	74.8	73.8	62.8
Don't Know	0.5	0.7	0.6
Black and White T.V.			
None	71.5	71.3	70.9
One	26.3	25.8	24.4
Two or More	2.1	2.9	4.7
Total*	30.5	31.6	33.8
Color T.V.			
None	17.6	8.6	3.8
One	71.0	67.8	56.5
Two or More	11.4	23.5	39.8
Total*	93.8	114.8	136.1
Type of Cooking Range			
Electric	35.4	52.8	73.7
Natural Gas	59.3	44.4	24.2
Bottled Gas	2.5	0.7	0.7
Other	2.1	1.7	1.1
Microwave Oven	22.1	39.2	55.1
Type of Refrigerator			
None	3.7	2.0	0.8
Manual Defrost	35.2	16.7	9.6
Frost-Free	57.6	73.5	77.0
Both Manual & Frost-Free	3.5	7.8	12.6
Frost-Free Refrigerators			
One	59.7	76.7	77.0
Two	2.0	4.9	12.8
Three or more	0.0	0.3	0.3
Total*	63.7	87.1	103.2
Freezer	13.9	27.3	41.7
Frost-Free Freezer	3.1	7.6	13.2
Dishwasher	37.2	63.4	82.3
Washing Machine			
Private Use	55.0	74.8	89.8
Multi-Residence Use	28.8	18.3	7.0

*Number of Appliances Per 100 Customers

	Low Consumption	Medium Consumption	High Consumption
Clothes Dryer			
Electric - Private Use	19.3	34.1	54.8
Natural Gas - Private Use	24.8	33.0	30.6
Bottled Gas - Private Use	0.8	0.5	1.1
Central Location	27.5	17.9	7.0
Not Sure	0.8	0.7	0.7
Type of Water Heater			
Electric	7.5	9.5	24.4
Natural Gas	83.0	82.0	63.1
Bottled Gas	2.9	1.2	1.8
Solar System	2.0	3.9	7.5
Central System	2.7	1.6	0.3
Don't Know	1.3	1.3	1.7
Swimming Pool			
Private	2.1	8.0	28.2
Central	22.6	16.8	19.6
Jacuzzi*	23.5	16.3	32.2

*Includes Central Use Facilities.

CHAPTER 12

METHODOLOGY

Background

The purpose of the 1981 Residential Energy Survey (Marketing Information Retrieval and Customer Load Estimate (MIRACLE)) was to obtain detailed information about major household appliance saturations and user characterisitcs in the SDG&E service territory. Saturation is defined as the percentage of residences, both renter and owner occupied, equipped with the various appliances.

The results of this study may be used to:

1. Fulfill the residential energy-use survey requirement mandated by CEC Common Forecasting Methodology requirements.
2. Forecast residential energy demands.
3. Assist in the analysis of overall system load factors.
4. Define market segments.
5. Estimate conservation potential
6. Develop savings estimates for cost effectiveness studies.
7. Estimate appliance consumption by the Conditional Demand Method.

While SDG&E had conducted earlier appliance saturation studies, it paved the way for complex economic studies of energy use in 1975 by merging the respondent's energy consumption history with the survey response data. At this time the sample size was greatly expanded to

allow for statistical validity for sub-regions of SDG&E's service area.

In 1978 after MIRACLE III, two commonly mentioned problems (1) lowered response rate due to inclusion of an income question, and (2) income and educational biases, were addressed directly through separate research studies. In the first study two samples of 500 customers were sent nearly identical questionnaires; one questionnaire included the income question and the other left it out. The response rate to both questionnaires was practically the same. The second problem was addressed by a "Non-Response" study conducted by Marylander Marketing Research. Although a small income and education effect was discovered, the supplier concluded that, overall, the information obtained from respondents was a reasonable representation of appliance and product ownership patterns among the universe.

Up until 1981, each of the MIRACLE surveys employed the same methodology. In 1981 the California Energy Commission (CEC) set stringent requirements for the survey. The present study obtained data in late 1981. Data collection for MIRACLE VI is expected to begin in early 1984.

Questionnaire Design

The overall design of the 1981 Residential Energy Survey (MIRACLE V) was set by the CEC. Beginning in March 1981, the CEC and its sub-contractor ADM Associates developed draft survey instruments and distributed them to utilities for review and comment. By August 1981, a final questionnaire was approved. The finalized survey design featured a mail phase, including an initial mailing and a follow-up mailing to non-respondents. A ten percent sample was taken of the mail phase

non-respondents, and a telephone or in-person follow-up was attempted.

The final version of the survey instrument contained 50 questions. The questionnaire was printed on bond stock tan paper in a 7" x 11" booklet. All pages were used for printing. A cover letter and the questionnaire were folded in thirds and placed in an envelope addressed to each customer in the sample. A postage paid return envelope was also enclosed, and the complete survey package was sent out at bulk rate. The Appendix contains the cover letter to the customer and the survey questionnaire.

Sampling Methodology and Response Rate

SDG&E customer billing data was analyzed by the CEC and stratification criteria developed. The CEC set up four dimensions in stratifying the sampling frame: 1) geographic area (climate zone); 2) presence of electric heating in the residence; 3) type of residence and meter type; and 4) kilowatt hour consumption. With these criteria 72 stratum were divised. Within a given strata, every SDG&E residential account was "tagged" with a random number. The accounts within each strata were then sorted in order of the random number. Then, for each strata, the number of required accounts were selected by simply picking the first n accounts from the randomly ordered file. Table 12.1 presents the total sample selected for each strata number assigned by the CEC, and the response rate associated with it. Upon selection of the sample, the file was sorted in zip code order and then in account number order within zip code.

Out of 15,000 questionnaires sent out, a total of 8041 (54%) usable questionnaires were returned before the cut-off date. The breakdown of responses by survey phase is:

First Mailing - Individual Meter	5214
Second Mailing - Individual Meter	1605
First Mailing - Master Meter	278
Second Mailing - Master Meter	119
Telephone Follow-up	607
In-Person Follow-up	149
Not Known	69

System level 95% confidence intervals for the various appliance saturations from a sample size of 8,041 are presented in Table 12.2.

TABLE 12.1

Response Rate by Strata Number

Strata Number	Population Size	Strata Sample Number	Response Number	Response Rate Percent
1	68,469	1,375	838	61%
2	69,786	1,403	898	64
3	25,035	503	315	63
4	225	5	1	20
5	15,913	319	171	54
6	16,810	337	177	52
7	4,827	97	55	57
8	2,376	48	10	21
9	1,489	30	15	50
13	5,672	114	62	54
14	6,518	131	84	64
15	1,877	37	20	54
16	186	3	0	0
17	16,526	331	145	44
18	16,990	342	184	54
19	6,487	131	77	59
20	2,884	59	7	12
21	6,792	137	60	44
23	56,434	1,134	601	53
24	82,993	1,668	1,009	60
25	21,774	437	244	56
26	637	13	5	38
27	26,557	534	238	44
28	41,001	823	390	47
29	10,512	211	98	46
30	12,809	258	38	46
31	2,114	42	14	33
35	4,499	90	38	42
36	4,421	89	52	58
37	1,284	25	12	48
38	414	9	3	33
39	20,233	407	169	41
40	19,665	395	175	44
41	6,922	139	64	46
42	7,684	155	26	17
43	9,579	192	83	43
45	29,325	589	350	59
46	30,598	615	382	62
47	10,533	211	137	65
48	114	3	1	33
49	4,859	97	40	41
50	7,849	157	87	55

Strata Number	Population Size	Strata Sample Number	Response Number	Response Rate Percent
51	3,282	66	37	56%
52	1,464	30	10	33
53	2,311	47	16	34
56	6,592	132	67	51
57	7,479	150	92	61
58	3,040	61	39	64
59	141	3	1	33
60	7,412	149	71	48
61	7,512	151	71	47
62	2,991	60	34	57
63	510	11	4	36
64	11,061	222	106	48
66	2,351	47	28	59
67	1,208	24	11	46
68	21	0	0	0
69	377	7	3	43
70	1,241	25	5	20
71	666	13	1	8
73	2,924	59	32	54
74	1,596	32	12	37
75	31	0	0	0
76	477	9	5	55
77	70	2	0	0
78	253	5	2	40

TABLE 12.2

System Level 95% Confidence Intervals For
Appliance Saturation Estimate

Sample Estimate of Appliance Saturation	95% Confidence Level
10 or 90%	± 0.7%
20 or 80%	± 0.9%
30 or 70%	± 1.1%
40 or 60%	± 1.1%
50%	± 1.2%

Survey Procedure

Two labels were computer printed for each customer in the sample. The first label contained account number, name, and service address; and was placed on the inside front page of the questionnaire. The second label contained account number, name, and mailing address; and was placed on the mailing envelope.

On September 11, 1981, the first mailing was sent to only the individual-metered residence (13,688). The master-meter mailing was sent out in October 1981 and was handled separately. As questionnaires were received, they were logged in using a specified code, each assigned a unique ID number, and then the corresponding duplicate set of labels that had been printed for each customer were removed. At the cut-off date of October 2, 1981, three weeks after the initial mailing, non-respondents to the first mailing were sent another questionnaire. In late October 1981, 7942 non-respondents to the mail phase were included in the follow-up phase of the study. All non-respondent households for whom a telephone number was available were called. All customers who could not be reached after five telephone calls were retired from the study. Personal interviews were attempted for the remaining households where a telephone number was not available. In the follow-up phase, 607 usable interviews were completed by telephone and 149 usable interviews completed in person.

Data Processing and Analysis

Every survey was hand edited for completeness, coded, and keypunched. The keypunched cards were then read onto the computer system. A cobol program was run to identify invalid or duplicate account

numbers. All errors were corrected in the data file. The data was sorted and each case merged with its gas and electric consumption history and related information. No weighting of the data file was needed as stated by the CEC in its working papers on "Development of Common Sampling and Surveying Methods for California Utilities - March 1982":

> We note that no such adjustments (weighted) are needed for the residential results (MIRACLE V). Despite certain prior statements to the contrary, it is the case, and can be shown mathematically, that all customers had equal probability of selection in the residential survey. Because of this, the sample does not include any groups with greater frequency than they occur in the population. Thus, the residential results will provide unbiased estimations in Conditional Demand Analysis.

At the completion of editing, sorting and merging the data, the entire file was copied onto a tape for permanent storage.

Appliance saturation estimates were obtained using the Statistical Package for the Social Sciences (SPSS) software package and are expressed as percentages.

San Diego Gas & Electric

Dear Customer:

The 1981 Residential Energy Survey is jointly sponsored by the California Energy Commission and San Diego Gas & Electric. The information that you and other customers provide about your appliances, your home, and your lifestyle will assist us in planning for San Diego's future energy needs.

Your response to this questionnaire is especially important to the success of this project since only a small sample of SDG&E customers has been randomly chosen to participate. Please take a few moments to answer the questionnaire and return it to us within the next few days in the postage-paid envelope.

Your answers will be kept in strictest confidence and will only be used in compiling energy usage patterns. Results will not be used for any marketing, sales, or promotional purpose.

If you should have any questions or problems filling out the survey, please call SDG&E at 232-4252, extension 1132.

Thank you for your time and your participation.

Sincerely,

Christina A. Bachman

CAB/pyk
Encl

Christina A. Bachman
Policy & Communication
Research Department

¡ATENCIÓN!

EL OBJECTO DE ESTE CUESTIONARIO ES PARA OBTENER INFORMACION SOBRE SU CONSUMO NECESARIO DE ELECTRICIDAD. ES MUY IMPORTANTE OBTENER LAS RESPUESTAS DE LAS PERSONAS DE HABLA ESPANOLA. SI USTED NO HABLA INGLÉS, SÍRVASE LLAMAR LIBRE DE CARGO A ESTE NÚMERO 232-4252 EXTENCIÓN 1853 DONDE SE LE HARÁN LAS PREGUNTAS POR TELÉFONO.

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