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A Study to Investigate The Hotel Manager's Reaction to The Increasing Electricity Rates in the City of Miami

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A STUDY TO INVESTIGATE THE HOTEL
MANAGER'S REACTION TO THE INCREASING
ELECTRICITY RATES IN THE CITY OF MIAMI

BY

Jamal Feerasta

A THESIS

Submitted in partial fulfillment of the
requirements for the degree of
Master of Science
in
The School of Hospitality Management
at
Florida International University

Committee in charge:

Dr. Donald Greenaway

Professor Fritz Hagenmyer

April 1981

To Professors: Donald Greenaway

Fritz Hagenmyer

This thesis, having been approved in respect to form and mechanical execution, is referred to you for judgment upon its merit.

Déan Gerald W. Lattin
School of Hospitality Management

The thesis of Jamal Feerasta is approved.

Professor

Professor

Date of Examination: April 1981

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1. Miami Marriott Hotel
1201 N.W. 42nd Avenue
Miami, FL
2. Miami Airport Inn
1550 N.W. Le Jeune Road
Miami, FL
3. Airport Lakes-Holiday Inn
1101 N.W. 57th Avenue
Miami, FL

4. Sheraton Riverhouse
3900 N.W. 21st Street
Miami, FL
5. Ramada Inn
3941 N.W. 22nd Street
Miami, FL
6. Inter-Continental Miami
801 S. Bayshore Drive
Miami, FL
7. Columbus Hotel
312 N.E. 1st Street
Miami, FL
8. Howard Johnson's
299 S.E. 2nd Avenue
Miami, FL
9. Marina Park Hotel
340 Biscayne Boulevard
Miami, FL

VITA

VITA

The author was born in Rangoon, Burma on July 16, 1952. His family migrated to Bangla Desh (then East Pakistan) in 1954. During the Bangla Desh Revolution his family migrated to Karachi, Pakistan. In 1977, the author completed his B.A. (Honors) in Economics from the University of Karachi. Under the Economics Research Center of the University, he conducted a study dealing with Pakistan's Hospitality Industry.

In March 1978, he joined Florida International University's, School of Hospitality Management. He completed the B.S. program in Hotel Management in June 1979 and was recruited by the Charley Brown's restaurant chain for their training program in Restaurant Management. In September 1979, he joined the M.S. program in Hotel Management at F.I.U. Upon the completion of this program, he will start as a Restaurant Management trainee with the Marriott Hotel chain.

THE PROBLEM AND ITS SETTINGS

STATEMENT OF THE PROBLEM

The purpose of the study is to investigate the hotel manager's reaction to the increasing electricity rates in the City of Miami.

STATEMENT OF THE SUBPROBLEMS

The first subproblem. The first subproblem is to determine the hotel manager's awareness to the trend of increasing electricity rates in the City of Miami.

The second subproblem. The second subproblem is to interpret the meaning of hotel management's awareness or lack of awareness of the implication of constant increases in electric energy costs.

THE HYPOTHESIS

The first hypothesis is that the management is aware of the increasing cost of electricity and its impact on the property's operations.

The second hypothesis is that the management does not have any specific or concrete policies to control the consumption of electricity.

THE DELIMITATIONS

The study will explore Miami hotel managers' reactions to the increasing electricity expenses due to the increasing

electricity rates.

No attempt will be made to investigate conservation techniques or the efficient use of electricity.

The study will not suggest any possible solutions to the pending problems.

Hotels having 150 rooms or more will be considered for the study.

ASSUMPTIONS

The first assumption. The first assumption is that the basic electricity rate structure and the ancillary rate will increase in the coming years.

The second assumption. The second assumption is that the hotels will be faced with increasing electricity expenses.

THE IMPORTANCE OF THE STUDY

The "U. S. Lodging Industry, 1980" report published by Laventhol and Horwath indicates that the average energy costs of hotels was 4.3 percent of total costs in 1979, compared to 4.5 percent in 1978. The reports indicate that in 1979 the average energy costs increased by 11.1 percent over 1978.

The energy usage components of a typical hotel consists of electricity, gas, and fuel oil. Of these, electricity constitutes the major source and cost component.

Though nationally, coal is followed by fuel oil as a

major source of electric power generation, and the use of oil as a source of power has declined, the dramatic increase in the price of oil has aggravated the situation. This is reflected in the increasing electricity rate structure as represented in the fuel adjustment charges.

Over fifty percent of the electricity generated by the Florida Power and Light Corporation (FP&L) is produced by fuel oil. Due to the increases in the price of oil the electricity rates have also increased, nearly at the inflation level, i.e., approximately by ten percent in the recent years. There is no indication that the dual trends of increasing rates and periodic shortages will subside. Since electricity costs constitute the major cost component of energy usage by a typical hotel, it is imperative that an investigation be conducted to determine the level of management's awareness to the trend of increasing electricity rates and their reactions.

In the past, very few in-depth studies have been done in the area of management's view of electricity rates and its impact on the hotel's operation in a given geographical area.

THE REVIEW OF THE RELATED LITERATURE

Energy Consumption - A National Overview

The United States, with six percent of the World's population, uses about 30 percent of the World's energy.

"The share of the nation's gross energy consumption accounted for by electricity generation rose to 31.2 percent in 1979, again setting a new record as it almost invariably does each year. The 1979 rise resulted from a 2.3 percent year to year rise in electricity generation in the face of a 2.5 percent drop in U. S. energy consumption, as indicated by the table below."¹

TABLE 1

U. S. Energy Consumption and Electric Generation for 1973-79

	Energy Consumption		Electric Consumption		Electric Share of Total
	Level (Q Btu)	Change (%)	Level (Q Btu)	Change (%)	(%)
1973	74.61	4.2	20.00	6.4	26.8
1974	72.76	-2.5	20.14	0.7	27.7
1975	70.71	-2.8	20.41	1.3	28.8
1976	74.51	5.4	21.54	5.5	28.9
1977	76.39	2.5	22.83	6.0	29.0
1978	78.15	2.3	23.42	2.6	30.0
1979	78.20	0.1	24.43	4.3	31.2

Q Btu - quadrillion Btu.

Source: U. S. Department of Energy, Monthly Energy Review.

¹Studness, Charles M., 'Electric Demand and Aggregate U. S. Energy Consumption' Financial News and Comment. Public Utilities Fortnightly, July 31, 1980, p. 38.

The 1979 increase in the share of energy being consumed through electric generation reflects a continuation of a methodical historical trend. Significantly, the shift in the nation's energy priorities and the sharp upward trend in energy prices initiated by the Arab oil embargo have had little impact on this trend. It is interesting to note that electric generation's share of energy consumption has increased from 26.8 percent in 1973 to 31.2 percent in 1979.

In part, the continuing rise of electric generation's share of energy consumption stems from the structure of energy prices encouraging a shift to electric usage, as electric rates have increased less since 1973 than the price of other forms of energy. For instance, "between 1973 and 1979 the price of residential electricity increased by 11.2 percent in constant dollars, while prices of residential natural gas jumped 58 percent and gasoline rose 36.3 percent. Prices of residential heating oil, which data are not available before 1974, rose 38.6 percent in constant dollars during 1974-79; the rise was close to 60 percent."²

The heavy dependence of U. S. on imported oil, has made the United States sensitive to increasing oil prices. It is virtually certain that the price of oil will steadily increase over the years. At the end of 1978, the price of OPEC oil averaged \$12.50 a barrel. By the end of 1979, this price approached \$25.00 a barrel. During 1979 alone, higher

²Ibid., p. 38.

prices caused the 8.4 million barrels a day imports to cost some \$35 billion more on annual basis than in 1978. Today the price of oil is around \$36 a barrel. Keeping in view the fact that electricity generation accounts for nearly 7 percent of the total oil consumption in the country, the plight of the utility companies has been aggravated by regulations and inflation, which has made the adding of new capacity prohibitively expensive. According to Edison Electric Institute, the average Capital Cost of a coal-fired plant has jumped from \$144 per Kwh in 1970 to an estimated \$1096 per Kwh today. For nuclear capacity the comparable numbers are \$165 and \$1861. The soaring cost of financing and running utilities have prompted companies to seek rate increases. In many states, rate increases have been denied outright by Public Utility Commissions (PUC), while average increases have hovered around 50 percent to 60 percent of the original request. Putting all these factors together, the implication is clear that the public will inevitably pay for the utilities problems. And, the reckoning may not be far away.

FLORIDA

Keeping the above discussion in view, any increase in the price of oil or a shortfall in the supply of oil, has and would add substantially to the cost of operations. This situation becomes acute and critical in the case of Florida.

Fuel oil is the major source of electric generation in Florida. In 1979 it accounted for nearly 47.8 percent followed by coal (19.4%), nuclear power (16.3%), natural gas (16.06%) and hydro (.27%). Florida ranks fourth in the use of oil for electricity power generation.

According to the statistics available on the composite averages of all fuels consumed by the Florida Electric Utility Industry, the cost per million Btu and the cost per Net Kwh has increased between the years 1975 to 1979. The cost per million Btu increased from \$148.5 in 1975 to \$223.9 in 1979, an increase of nearly 50 percent. The cost per Net Kwh has gone up from \$1.56 in 1975 to \$2.34 in 1979, an increase of 50 percent also. This is shown in Table 2.

TABLE 2

<u>Year</u>	<u>Cost/Million BTU</u>	<u>Cost/Net KWH</u>
1975	\$148.5	\$1.56
1976	149.6	1.59
1977	170.0	1.78
1978	170.0	1.80
1979	223.9	2.34

Source: Statistics of Florida Electric Utility Industry 1979.

MIAMI

Florida Power and Light Corporation (FP&L) is the sole electricity supplier to the City of Miami. Fuel oil has been and will be the major source of fuel, (nearly 46%), for the generation of electricity, at least, till the end of the

decade. However, in the coming years, coal would contribute substantially towards the generation of electricity. This is shown in Appendix A.

Florida Power and Light Corporation estimates that by the year 1989 it would be serving 2.84 million customers compared to 2.07 million customers in 1979, an increase of 37 percent. The estimated sales for the year 1989 is 59.88 billion Kwh compared to 41.97 billion Kwh in 1979, an increase of 43 percent in sales. During the same period, the increase in electricity generation capability is estimated to be up by 29 percent, from 10.96 thousand Mw in 1979 to 15.51 thousand Mw implying adequate supply capacity. This is shown in Appendix B.

Between the years 1975 to 1980, the number of commercial customers served by the FP&L increased from 173,346 in 1975 to 212,950 in 1980, up by 22.8 percent. Whereas, the Kwh sales was up by 27.3 percent. It is interesting to note that the percentage of commercial customers to total customers did not show any significant shift. However, the Kwh sales for commercial customers as a percentage of total Kwh sales has decreased, clearly implying that the commercial customers are conserving electricity. These trends are shown in Table 3.

The cost of producing electricity has been going up. In 1978, 33 cents of every dollar spent, went for the payment of fuel. This amount increased to 41 cents in 1979 and was 44 cents in 1980. These increases were passed on to the cus-

TABLE 3

Summary of Total Customers and Commercial Customers
KWH and KWD

Item	1975	1976	1977	1978	1979	1980
(a) Total Customers	1,772,304	1,840,043	1,927,668	2,032,298	2,140,587	2,247,688
(b) Commercial Customers	173,346	179,917	187,808	197,278	206,977	212,956
(c) Commercial Customers as a Percentage of Total Customers	9.7	9.7	9.7	9.7	9.6	9.5
(d) Total KWH (000)	34,110,898	34,929,541	37,529,397	40,602,076	41,965,810	44,710,000
(e) Commercial KWH (000)	11,850,752	12,117,063	12,885,079	13,748,349	14,374,287	15,089,288
(f) Commercial KWH as a Percentage of Total KWH (000)	34.7	34.7	34.3	33.8	34.0	33.7

tomers in the form of fuel adjustment charges. The trend of the fuel adjustment charges between 1974 to March 1981 (see Appendix C), shows that fuel adjustment charges have mostly been on the increase. For the period March 31, 1981 to April 1981, the charges were up by \$6.50 to \$19.50 per 1000 Kwh. Further increases are scheduled for May 1981.

From the preceding discussion, it is clear that the era of cheap energy is over. When such a situation is considered from the point of hotel operations, it deserves special attention.

LODGING INDUSTRY

To date very little study has been done in the area of electricity rates and hotel management's view of the situation, in a given area or region.

A study was conducted by the Energy Technical Center of the Hospitality, Lodging and Travel Research Foundation, dealing with the analysis of energy use in 284 hotels and motels located in thirty-nine states and the District of Columbia. These 284 properties comprised four percent of American Hotel and Motel Association membership. The report concluded that, "even with the hospitality industry's improvement in energy use over the past three years, the cost of energy has increased at an even greater pace. In 1979, the average annual cost of energy per square foot of property was an estimated \$1.08. And, in mid-1981, indications are

that the average cost of energy will continue to increase at a fifteen to twenty percent annual rate. Now, more than ever, increased and effective energy management practices are essential to the continued growth and financial well-being of the hospitality industry."³ The findings of the study are shown in Table 4.

According to the Laventhol and Horwath's, U.S. Lodging Industry Reports, the energy costs per room have increased between the years 1975 to 1979. However, the energy costs ratio to room sales and total sales have largely declined for all categories of hotels. Table 5 also indicates that the greatest increases in the energy cost per room is for properties having 600 rooms or more. The increase was 2.0 percent between 1977 and 1978 and 14.0 percent between 1978 and 1979. It is interesting to note that when the cost ratio of energy to occupancy is taken into account, the highest increase has taken place in the properties having occupancy of over 80 percent. This increase was by 6.4 percent between 1977 and 1978 and 18.5 percent between 1978 and 1979. However, when energy costs are taken as a ratio to room sales, we see that the ratio to room sales and total sales, have remained consistent or have decreased. This clearly implies that in order to meet the increasing operating

³Energy Technical Center, The Hospitality Lodging and Travel Research Foundation, Inc., "Analysis of the Energy Use of 284 Hotels and Motels, 1979," p. ii.

TABLE 4
Energy Use By the Lodging Properties

	1977	1978	1978 versus 1979 (Same Properties)	
No. of Properties	210	327	284	284
No. of Guest Rooms	59,648	84,554	68,911	69,368
Total Sq. Ft. (mln)	42.6	52.6	40.4	40.8
Total Energy Use (Trillions of BTU's)	7.7	8.4	6.2	5.9
BTU/sq. ft./yr.	181,685	158,736	153,308	143,977
Indicated Decrease in Energy Use:				
. . .1978 versus 1977	---	12.6%	---	---
. . .1979 versus 1978	---	---	---	6.1%
. . .1979 versus 1977	---	---	---	20.8%

(In considering the above indicated 6.1% decrease in energy use by 284 hotels and motels, 1979 versus 1978, it should be noted that the American Hotel and Motel Association estimates that the average guest occupancy for 1979 was at 67.8 percent, compared to 65.5 percent in 1978--an increase of 3.5 percent.)

TABLE 5
Average Energy Costs of U.S. Lodging Properties

Energy Costs	ROOMS				OCCUPANCY %				
	Under 100 Rms	150- 299	300- 600	Over 600	Under 50%	50- 59	60- 69	70- 79	Over 80
Media Amounts per Available Room									
1979	\$597.00	\$588.00	\$669.00	\$889.00	\$464.00	\$507.00	\$620.00	\$642.00	\$709.00
1978	544.00	557.00	665.00	778.00	588.00	518.00	587.00	613.00	598.00
1977	507.00	489.00	571.00	764.00	567.00	488.00	522.00	559.00	562.00
1976	454.00	444.00	510.00	616.00	422.00	443.00	478.00	489.00	499.00
1975	389.00	381.00	444.00	522.00	322.00	385.00	379.00	506.00	440.00
Ratio to Room Sales									
1979	8.5%	7.7%	6.9%	7.7%	11.7%	9.4%	8.8%	7.6%	6.5%
1978	8.6	8.3	7.6	8.5	11.4	10.2	9.0	8.0	7.1
1977	9.2	8.5	8.6	9.0	12.3	9.7	9.2	7.5	7.2
1976	8.7	8.4	8.4	9.0	12.3	10.0	8.6	7.6	7.3
1975	8.9	7.8	7.8	8.0	10.1	9.2	7.5	7.5	7.7
Ratio to Total Sales									
1979	5.7%	4.9%	4.0%	4.5%	6.5%	5.9%	5.5%	4.5%	4.0%
1978	5.7	4.9	4.4	4.5	6.0	6.4	5.2	4.5	4.3
1977	5.8	5.2	4.5	5.3	8.3	6.1	5.3	4.6	4.4
1976	5.7	4.9	4.9	4.7	7.0	5.6	5.1	4.4	4.5
1975	5.6	4.9	4.3	4.6	6.4	5.3	4.3	4.5	4.6

Source: Laventhol & Horwath's, U.S. Lodging Industry Reports, 1976, 1977, 1978, 1979, 1980.

costs, the properties have generally passed on the burden to the guests in the form of higher room rates, etc.

FLORIDA

In comparing the energy costs per available room for the lodging properties in Florida with that of the national trend, we see that in 1975, 1976, 1977 and 1978 the properties in Florida allocated 27 percent, 10 percent, 7 percent and 13 percent more dollars respectively than the properties in the U. S. as a whole.

In terms of energy costs per occupied room, Florida lodging properties paid 16 percent, 11 percent, 8 percent and 7.6 percent more for the corresponding period. These comparisons are shown in Table 6.

TABLE 6

Energy Consumption by Lodging Properties
In Florida

Median Amount/ Available Room/ Annual	Fuel	Elec.	Water	Total	Fla. Elec.		Total U.S.	Fla. vs. U.S.
					% of Total	Energy		
1978	\$71.00	\$502.00	\$80.00	\$665.00	75%		\$587.00	13%
1977	71.00	416.00	78.00	567.00	73%		529.00	7%
1976	57.00	412.00	58.00	523.00	79%		477.00	10%
1975	50.00	432.00	51.00	533.00	81%		418.00	27%

Cost/Occupied Rm/ Per Day	\$	.32	2.28	.35	2.96	77%	\$	2.75	7.6%
1978									
1977		.35	2.27	.35	3.00	75%		2.78	8%
1976		.28	2.10	.26	2.64	79%		2.38	11%
1975		.22	1.88	.22	2.32	81%		2.00	16%

Source: Laventhol and Horwath's, Florida Lodging Industry Reports, 1976, 1977, 1978, 1979.

TABLE 7

The Lodging Industry Dollar, U. S.
Versus Florida, Where It Went

ENERGY

	<u>1978</u>	<u>1977</u>	<u>1966</u>	<u>1975</u>
U.S.	4.5	4.9	4.9	5.0
Florida	10.3	10.1	5.2	6.7

NET INCOME BEFORE TAXES

	<u>1978</u>	<u>1977</u>	<u>1976</u>	<u>1975</u>
U.S.	7.5	5.5	3.5	1.6
Florida	3.5	3.4	1.2	(-1.4)

Source: Laventhol and Horwath's, Lodging Industry Reports, 1976, 1977, 1978, 1979.

A comparison between the Florida properties and the National trend for the allocation of energy expenses as a percentage of total sales shows that the Florida properties have been allocating substantially higher amounts between the years 1975 to 1978. On the other hand, the national net income average before taxes has been higher than for Florida properties. These comparisons are shown in the above Table.

The preceeding discussion clearly implies that since the Florida properties have been faced with greater energy

costs in general and higher electricity costs in particular, compared to the national averages, these properties, in the future, will be faced with higher energy costs. It is imperative that sooner or later the management will have to accept the reality of the situation and take measures to minimize the negative impact.

A study by Professor Redlin of Cornell University's School of Hotel Administration, suggests a method of regression analysis which can be used by the management to project the consumption of utilities more accurately and therefore budget and control the use consumption of utilities more efficiently. However, the study does not take into account the management's views or reactions to the increasing electricity rates.

The importance of management's awareness and reactions to the possible impact of increasing utility costs can be illustrated by the following case studies.

CASE I

La Quinta Motor Inn

La Quinta Motor Inns, Inc., is a San Antonio-based chain of approximately 100 motor inns, averaging about 130 rooms each. The chain spends an average of \$347 per room per year on utilities. Nothing that goes in the room costs

more.⁴

The chain learned from AH & MA's Energy Technical Center that electric costs are expected to rise by 11.8 percent in 1978, gas by 17 percent, and oil by 19 percent. The company decided that they must control utility consumption. So they decided to approach utility cost reduction in two ways: 1) more practical operations control, and 2) better utilization of energy-saving technology in construction.

The operations control involves the area of preventive maintenance of the physical plant, equipment, and emphasis on the plant's insulation. As a result of the practical operations approach, it was found that the efficiency of the water heaters and gas dryers increased by nearly 30 percent. This is shown in Figure 1 on the following page.

In the area of construction technology, La Quinta has been widely publicized as one of the few lodging chains that is experimenting broadly with solar energy. It is also one of the few chains to use heat pumps extensively and other energy-saving construction techniques.

⁴La Quinta Motor Inns, San Antonio, "A Case Study in Energy Management: Controlling the Cost of Utilities," Lodging, June 1979, p. 7.

Figure 1

Improvements in domestic hot water heating as a result of cleaning combustion chambers, adjusting firing rate, insulating hot water piping.

(1) Percentage of efficiency of domestic hot water system prior to program efforts. (2) Improvements in efficiency after cleaning combustion chambers and adjusting firing rate. (3) Further improvement after the insulation of hot water piping. Note that percentage of efficiency in what is, in most hotels and motels, the biggest factor in energy costs, was approximately doubled.

CASE II

Ramada Inn-Airport, San Antonio, Texas

The Ramada Inn-Airport, San Antonio, Texas has 200 guest rooms and sizable public areas consisting of a restaurant/kitchen, lounge, administrative offices, meeting rooms, lobby, and a laundry. The complex consists of five free-standing buildings and an outdoor swimming pool. The interior area of the total property is 111,425 square feet. The property is nineteen years old.

"In 1972, the Ramada Inn-Airport, San Antonio, Texas, was paying in the order of eight mils (0.8 cents) a kilowatt hour for electricity and 3.5 cents a therm for natural gas. In 1978, these costs had increased to 3.5 cents/Kwh for electricity and 23 cents/therm for natural gas--representing a very substantial per unit cost increase. In 1978, the Ramada Inn-Airport consumed 1,475,952 Kwh of electricity and 72,768 therms of natural gas. The total cost of electricity and natural gas was \$68,305. The cost of similar amounts in 1972 would have been \$14,354. This represents an increase in cost of \$53,951, or 376 percent."⁵

Realizing the potential impact of increasing utility rates, the management took some steps that brought about substantial reduction in the consumption of utilities. For example, a comparison of the energy use between the years 1977 and 1978 revealed that, "in 1977 the property required 111,022 Btu/sq. ft., while in 1978, the requirements decreased to 110,502 Btu/sq. ft.--a reduction of 520 Btu/sq. ft. Energy costs, even after increases in unit costs in 1978, remained virtually the same: \$68,666 in 1977, and \$68,385 in 1978."⁶

Thus, the above cases clearly show that it was the increasing cost of utilities that led the management to move in the direction of energy conservation and its efficient use.

⁵Jack Wolfe, "The Ramada Inn-Airport, San Antonio, "A Case Study in Effective Energy Management," Lodging, May 1979, p. 30.

⁶Ibid., p. 32.

THE RESEARCH METHODOLOGY

Interviews were arranged with the management personnels. The questions asked during the interview process were in the form of a Questionnaire. The purpose of such a questionnaire was to maintain consistency and uniformity in the type of questions asked to the various hotel operators. The questions were carefully worded, which were intended to reveal more than the simple answers given.

The criteria for the properties to be selected were:

1. Hotels to be located within the City of Miami
2. Hotels to have 150 rooms or more.

The Dade County Tourist Accommodation Facilities Directory of 1980, published by the Metro Dade Department of Tourism was used as a primary source for the selection of the samples. The facilities are listed by the area they are located in and categorized as hotels and motels, (Refer to Appendix D).

The city limits of the City of Miami borders N.E. 87th Avenue in the north; Bettersea Road to the south. To the east, it borders MacArthur Causeway including the Dodge Island Seaport and Virginia Key; to the west it stretches up to W. 77th Avenue and 8th Street, (Refer to Appendix E).

Eighty-one hotels comprising 8399 rooms are located within the city limits. Of these, only 18 hotels have 150 rooms or more. Management of these 18 hotels was contacted for the purpose of the study. After evaluating their responses,

the responses of 9 properties were selected as samples. These samples comprised 11 percent of the total hotels and 34 percent of the available hotel rooms, in the City of Miami.

The interpretation and the findings of these interviews are discussed below.

Hypothesis I

The first hypothesis is that management is aware of the increasing cost of electricity and its impact on the property's operation.

From the interviews, it was evident that the management is aware of the increasing cost of electricity and its impact on their property's operation.

Due to the paucity of the numerical data, the hypothesis cannot be convincingly proved. However, the interpretation of the data obtained clearly supports the hypothesis.

Table 8, shows that the electricity cost as a percentage of total energy cost has been increasing for the given properties.

TABLE 8
Electricity Cost as a Percentage of
Total Energy Cost

<u>Hotels</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981 (expected)</u>
1	N.A.*	30.0	14.0	14.0
2	91.0	90.0	88.6	N.A.
3	N.A.	84.0	89.0	N.A.
4	N.A.	98.0	98.0	N.A.
5	N.A.	95.0	95.0	N.A.
6	N.A.	N.A.	N.A.	N.A.
7	73.6	69.5	72.6	75.8
8	95.0	95.0	92.0	N.A.
9	89.3	90.4	91.3	N.A.

*N.A. = Not Available

Table 9, clearly shows that although the electricity cost has been increasing, its increases have largely been at a decreasing rate, except for Hotel #5, 8 and 9.

TABLE 9
Electricity Cost Increase (%)

Hotels	1978	1979	1980	1981 (expected)
1	N.A.*	30.0	14.0	14.0
2	N.A.	40.0	18.8	N.A.
3	N.A.	25.0	21.0	N.A.
4	N.A.	20.0	20.0	N.A.
5	N.A.	10.3	11.2	N.A.
6	N.A.	N.A.	N.A.	N.A.
7	19.8	14.2	N.A.	26.0
8	N.A.	16.0	31.0	11.0
9	7.3	20.0	40.0	N.A.

*N.A. = Not Available

In the case of Hotel #5, the electricity cost measured by 11.2 percent in 1980 compared to 10.3 in 1979. However, in the case of Hotels #8 and 9, the electricity cost increases nearly doubled--from 16 percent in 1979 to 31 percent in 1980 and from 20 percent in 1979 to 40 percent in 1980 for Hotels #8 and 9 respectively.

The management's awareness of the impact of increasing electricity cost on the building's operation maintenance is lacking. Only 3 properties from the sample had information readily available on this aspect. This is shown in Table 10.

TABLE 10

Effect of Electricity Cost on
Building Operation Maintenance Cost

Hotel	1978	1979	1980	1981 (ex- ced)
1	N.A.*	N.A.	N.A.	N.A.
2	N.A.	65.6	4.6	3.2
3	N.A.	4.3	4.2	N.A.
4	N.A.	N.A.	N.A.	N.A.
5	N.A.	N.A.	N.A.	N.A.
6	N.A.	N.A.	N.A.	N.A.
7	N.A.	N.A.	N.A.	N.A.
8	N.A.	N.A.	N.A.	N.A.
9	15.9	41.8	44.4	N.A.

*N.A. - Not Available

Hypothesis II

The second hypothesis is that the management does not have any specific or concrete policies to control the consumption of electricity.

Referring to the Questionnaire in Appendix F, some questions were asked in order to determine the validity of the hypothesis. These questions are numbered 6 through 14. The results have been tabulated in Appendices G to K.

Method of Determining Exact Energy Consumption

Only 22 percent of the properties from the sample have some method of determining exact energy cost. Implying thereby, that the management does not perceive the situation to be serious enough or critical to warrant any actions for determining the exact energy consumption by the various departments on the property.

Energy Consumption Allocation Based on Formula

Nearly twenty-two percent of the properties from the sample group allocate energy consumption based on formula or assumed consumption by the various departments of the hotel. The most common allocation is based on the assumption that rooms department consume nearly 80 percent of the total energy used.

Energy Budget

Seventy-seven percent of the sample properties do prepare energy budgets. The budget is based either at assumed

inflation level or on the expected increases by the FP&L. This has been in practice since their first day of operation.

Unique Idea Regarding Energy Conservation

None of the properties have come up with a unique idea regarding the conservation of energy, which could have contributed to the overall corporate policy.

Guidelines Regarding ROI/Payback Period

Thirty-three percent of the properties surveyed had certain guidelines laid down by the corporate office on the owners regarding the ROI or the payback period on energy related equipments. It is of interest to note that these properties were built in the mid or late seventies--the time of energy crisis and economic downturn. Thereby implying that the idea of energy conservation, efficient use of equipments and increasing electricity rates were considered. For example, one of the property's had to relate the ROI or the payback period on energy related equipment to the estimated sales. That is, if the addition of any equipment increased the sales than it was considered feasible to install such equipment. In another property, payback of 2 years or less was the basis of selecting equipments. One of the properties built in the early 70s, emphasized the payback period or ROI for the last 3 years only.

Measures Taken by the Managers to Control Energy Costs

When the managers were asked about the various measures

they have taken thus far to meet or control the increasing cost of electricity their responses indicated, it was only recently that they resorted to measures that would give them some indication as to the usage and control of electricity. The responses were as follows:

(a) Conduct Energy Audits

Nearly fifty percent of the properties conducted energy audits annually.

(b) Periodic Reading of the Electric Meters

In most cases, reading of electric meters by the hotel's personnel on a daily basis is a recent development. Earlier the readings by the FP&L sufficed.

(c) Look Into the Various Electric Rate Options

None of the properties surveyed had looked into the various electric rate options.

(d) Keep a Close Watch on Demand Rate

Only thirty percent of the properties kept a close watch on demand rates. Therefore, not on the list of high priorities.

(e) Calibration of the Meters

None of the properties did the calibration of the meters on their own but left it to FP&L to look after it.

(f) Energy Conservation Instruction to the Employees

It was only within the last one year that the

management instructed the employees in the basics of energy conservation.

(g) Inspection of Electric Appliances

Sixty percent of the properties surveyed had their electric appliances inspected regularly by their staff.

(h) Inspection and Strict Control of the HUAC System

The inspection and strict control of the HUAC system was practiced by sixty percent of the properties. The inspection is generally conducted on a bi-weekly basis.

(i) Use of 'Economizer' Equipments

Only one property and that too recently has installed economizer units.

(j) Hire Outside Consultants to Evaluate and Suggest Remedial Measures

Only twenty percent of the properties had hired outside consultants recently, to inspect the physical plant and suggest remedial measures.

Thus from the above findings it is evident that the management at large do not have any concrete or specific plans to control the consumption of electricity.

OTHER FINDINGS

1. In many instances the management was not aware of the simple ways of controlling electricity costs.
2. Electricity is the major source of energy used by the properties, followed by natural gas and fuel oil.
3. On the average, 83 percent of the total energy usage comprises of electricity and approximately 15 percent is natural gas (See Appendix M).
4. On the average, nearly 75 percent of the electricity is consumed by the rooms (See Appendix I).
5. Airport area properties are less worried at this time about increasing electricity costs, primarily because of high occupancy around the year. To meet the increasing cost of operations, these properties have been able to increase their room rates, etc. without any negative effect on their occupancies.
6. Of the sample hotels, properties that were built before 1970, are faced with greater energy costs because of the lack of adequate energy conservation technology and lack of emphasis on energy conservation at that time. However, these properties are now refurbishing and installing efficient equipments.

SUMMARY OF THE RESULTS

The samples constitute 11 percent of the hotels and 34 percent of the available hotel rooms in the City of Miami.

These properties have between 150 to 600 rooms. The results of the interview imply clearly that the management is aware of the impact of the increasing energy costs at large and electricity cost in particular and their impact on the property's operation. At this time, management at large do not have any specific or concrete plans to control and account for the consumption of electricity. However, it is only recently that the managements have started working towards specific plans to control and account for the consumption of energy. It is only a matter of time before such practices would become universal.

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APPENDICES

APPENDIX A

APPENDIX B

FLORIDA POWER AND LIGHT CORPORATION CUSTOMERS,
KWH SALES AND MEGAWATT CAPABILITY

Year	Customers (Millions)	Kwh Sales (Billions)	Mw Capability (000)
1975	1.74	34.11	8.93
1976	1.80	34.93	9.74
1977	1.88	37.53	10.64
1978	1.97	40.60	10.94
1979	2.07	41.97	10.96
1980	2.17	43.71	11.73
1983	2.40	49.27	13.25
1986	2.65	54.60	13.45
1989	2.84	59.88	15.51

APPENDIX C
FUEL ADJUSTMENT

36

		PER KWH	PER 1,000 KWH
1973	May	0¢	\$ 0
	June	.014¢	\$.14
	July	.014¢	\$.14
	August	.071¢	\$.71
	September	.086¢	\$.86
	October	.087¢	\$.87
	November	.124¢	\$1.24
	December	.081¢	\$.81
1974	January	.183¢	\$1.83
	February	.216¢	\$2.16
	March	.378¢	\$3.78
	April	.473¢	\$4.73
	May	.521¢	\$5.21
	June	.571¢	\$5.71
	July	.639¢	\$6.39
	August	.8 ¢	\$8.00
	September	.784¢	\$7.84
	October	.919¢	\$9.19
	*November	.919¢	\$9.19
	*December	.919¢	\$9.19
	*Frozen at October level.		
1975	January (12/27-1/27)	.847¢	\$8.47
	February (1/28-2/25)	.784¢	\$7.84
	March (2/26-3/26)	.533¢	\$5.33
	April (3/27-4/24)	.575¢	\$5.75
	April (4/25-4/30)	.665¢	\$6.65
	May (5/1-5/31)	(.109¢)	(\$1.09)
	June (6/1-6/30)	.271¢	\$2.71
	July (7/1-7/31)	.367¢	\$3.67
	August (8/1-8/31)	.382¢	\$3.82
	September (9/1-9/30)	.123¢	\$1.23
	October (10/1-10/31)	.206¢	\$2.06
	November (11/1-11/30)	.180¢	\$1.80
	December (12/1-12/31)	.110¢	\$1.10
1976	January (1/1-1/31)	.127¢	\$1.27
	February (2/1-3/1)	.092¢	\$.92
	March (3/2-3/31)	(.070¢)	(\$.70)
	April (4/1-4/30)	(.094¢)	(\$.94)
	May (5/1-5/31)	(.132¢)	(\$1.32)
	June (6/1-6/30)	(.042¢)	(.42)
	July (7/1-7/31)	.207¢	\$2.07
	August (8/1-8/31)	.167¢	\$1.67
	September (9/1-9/30)	.141¢	\$1.41
	October (10/1-10/31)	.248¢	\$2.48
	November (11/1-11/30)	.310¢	\$3.10
	December (12/1-12/31)	.079¢	\$.79

		Residential Base Bill For 1,000 kWh		
		Per kWh	Per 1,000 kWh	
January	(1/1-1/31)	.396¢	\$3.96	\$38.93 (1)
February	(2/1-3/1)	.278¢	\$2.78	37.09 (2)
March	(3/2-3/31)	.222¢	\$2.22	36.53/39.31 (3)
April	(4/1-5/1)	(.224¢)	(\$2.24)	34.85
May	(5/2-5/31)	(.173¢)	(\$1.73)	35.36
June	(6/1-6/30)	.039¢	\$.39	37.48
July	(7/1-8/1)	.082¢	\$.82	37.91/39.80 (4)
August	(8/2-8/31)	.353¢	\$3.53	42.51
September	(9/1-10/2)	.411¢	\$4.11	43.09
October	(10/3-10/31)	.185¢	\$1.85	40.83
November	(11/1-11/30)	.063¢	\$.63	39.61
December	(12/1-1/2)	(.103¢)	(\$1.03)	37.95
January	(1/3-1/30)	(.133¢)	(\$1.33)	\$37.65
February	(1/31-3/1)	.013¢	\$.13	\$39.11
March	(3/2-3/31)	.089¢	\$.89	\$39.87
April	(4/1-5/1)	.188¢	\$1.88	\$40.86
May	(5/2-5/31)	(.214¢)	(\$2.14)	\$36.84
June	(6/1-6/30)	.005¢	\$.05	\$39.03
July	(7/1-8/1)	.282¢	\$2.82	\$41.80
August	(8/2-8/31)	.161¢	\$1.61	\$40.59
September	(9/1-10/2)	.177¢	\$1.77	\$40.75
October	(10/3-10/31)	.285¢	\$2.85	\$41.83
November	(11/1-12/1)	.307¢	\$3.07	\$42.05
December	(12/2-1/2)	(.029¢)	(\$.29)	\$38.69
January	(1/3-1/31)	(.076¢)	(\$.76)	\$38.22
February	(2/1-3/1)	.079¢	\$.79	\$39.77
March	(3/2-3/31)	.265¢	\$2.65	\$41.63
April	(4/2-4/30)	.298¢	\$2.98	\$41.96
May	(5/1-5/31)	.279¢	\$2.79	\$41.77
June	(6/1-7/1)	.978¢	\$9.78	\$48.76
July	(7/2-7/31)	.865¢	\$8.65	\$47.63
August	(8/1-8/30)	1.118	\$11.18	\$50.16
September	(8/31-10/1)	.801¢	\$8.01	\$46.99
October	(10/2-10/31)	.943¢	\$9.43	\$48.41
November	(11/1-12/2)	.948¢	\$9.48	\$48.46
December	(12/3-1/1/80)	.799¢	\$7.99	\$46.97

(1) Base charge is \$34.97 + fuel adjustment for January, 1977

(2) Base charge is \$34.31 + fuel adjustment for 2/1/77 - 3/13/77

(3) Base charge is \$37.09 + fuel adjustment for 3/14/77 - 7/7/77

(4) Base charge is \$38.98 + fuel adjustment for 7/8/77 - present

Residential
Base Bill
for 1,000
kWh

	<u>Per kWh</u>	<u>Per 1,000 kWh</u>	<u>- kWh</u>
January (1/2-1/31)	.359¢	\$3.59	\$42.57
February (2/1-3/2)	.992¢	\$9.92	\$48.90
March (3/3-3/31)	1.073¢	\$10.73	\$49.71
April 1 through September 30 (Adjusted)	1.475	\$14.75	\$53.73
October - November	1.160	\$11.60	\$50.58
December - March 1981	1.320	\$13.20	\$52.18
MARCH '81 - APRIL 1981	1.950	19.50	58.48

Base charge is \$38.98 ± fuel adjustment for 7/8/77 - present

DADE COUNTY TOURIST ACCOMMODATION FACILITIES*
BY AREA** AND TYPE OF FACILITY

39

Area**	Hotels		Motels		Total	
	Number	Units	Number	Units	Number	Units
Miami Beach	320	29,174	23	1,497	343	30,671
Surfside/Bal Harbour	13	1,943	25	1,134	38	3,077
Sunny Isles	6	1,036	55	6,245	61	7,281
North Dade	19	1,398	112	4,617	131	6,015
Airport	10	2,023	10	1,217	20	3,240
Downtown	56	5,174	8	569	64	5,743
Key Biscayne	3	604	7	314	10	918
South Dade	18	1,089	94	2,657	112	3,746
TOTAL	445	42,441	334	18,250	779	60,691

*Includes only those tourist accommodation facilities classified and licensed either as hotels or motels by the State of Florida Department of Business Regulation, Bureau of Licensing, Division of Hotels and Restaurants, as of February 1980.

**Area as defined according to the following definitions:

Miami Beach: All tourist facilities in the corporate limits from Government Cut on the south to 87th Terrace on the north.

Surfside/Bal Harbour: All tourist facilities located within the corporate limits of both municipalities from 88th Street on the north to Baker's Haulover Cut.

Sunny Isles: All tourist facilities located from Haulover Beach north to the Broward County Line east of Biscayne Bay and the Intracoastal.

North Dade/Other: All tourist facilities located from Flagler Street on the south to the Broward county line exclusive of the following areas: Downtown, Airport, Miami Beach, Surfside/Bal Harbour and Sunny Isles.

Airport: All tourist facilities located from Flagler Street on the south to the Miami Canal on the north and from the Palmetto Expressway on the west to N.W. 37th Avenue on the east.

Downtown: All tourist facilities located from I-95 on the west to Biscayne Bay on the east and S.W. 12th Street on the south to N.W. 36th Street on the north.

Key Biscayne: All tourist facilities located on Key Biscayne including Virginia Key and the entrance to the Rickenbacker Causeway.

South Dade/Other: All tourist facilities located south of Flagler Street to the Monroe County Line excluding Key Biscayne and the Downtown Area.

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CITY of MIAMI, FLORIDA

MUNICIPAL ATLAS SHEET INDEX

KEY

TO SECTIONAL DIVISION
OF
THE CITY OF MIAMI

DATE: 1958
BY: [illegible]
FOR: [illegible]
SHEET: [illegible]
SCALE: [illegible]
REVISION: [illegible]

CORAL GABLES

BIRD RD.

POINCIANA AVE.

SOUTH DIXIE HWY.
RD. 1
RD. 2
RD. 3
RD. 4
RD. 5
RD. 6
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47

APPENDIX F.

NAME OF THE PROPERTY

LOCATED AT:

BUILT:

NUMBER OF ROOMS:

DESIGNATION OF THE PERSON INTERVIEWED:

* * * * *

1. In your position, are you permitted by the Corporate office/ Owners to take part in Hospitality industry related projects conducted by universities?

2. Will your participation be

i. Active

ii. Passive

3. What forms of energies do you use on the Property?

Electricity

Natural Gas

LPG

Fuel Oil

Other

4. Consider each of the following energy sources. What is the approximate ratio of each source to total energy costs?

Electricity

Natural Gas

LPG

Fuel Oil

Other

5. Over the last 3 years, by how much (approximate percentage) has the Property's electricity cost gone up by?

Year	% of Total Energy Cost	% Electricity Cost Increase
------	---------------------------	--------------------------------

1977-78

1978-79

1979-80

1980-81 (expected)

- 6(i). In your control program, do you have a method of determining the exact energy consumption in any of the following areas?
Rooms, Cooking, Dishwashing, Restaurant, Lobby, Laundry,
Exterior lighting, Any Other area(s).

YES

NO

- 6(ii). If Yes, when did you begin using exact Controls ?

- 7(i). If the answer to question number 6(i) is No, then do you allocate Energy consumption on a formula basis?

YES

NO

- 7(ii). Could you give me some insight into the basis of the Formula which you use?

8. Please give me some idea (approximate percentage) about the consumption of electricity in the following areas:

Rooms

..... %

8. (continued)

Cooking _____ %

Dishwashing _____ %

Restaurant _____ %

Lobby _____ %

Laundry _____ %

Any Other Uses _____ %

9. Do you prepare short and long term energy budgets for the Property's electricity consumption?

YES

NO

In The Process of Formulation

10. If Yes, when was this policy implemented? _____

11. Considering the fact that each Property is unique, what contributions have come from this Property that have contributed to the overall Corporate policy related to Energy conservation and usage?

12. Considering the possible seriousness of the energy problems that may develop unexpectedly, what would you do on a personal basis if you are faced with continuous crisis such as Brown-outs and Blackouts?

13(i). . Are there any guidelines that you follow or that are suggested by the Corporate office/Owners regarding the R.O.I. or Payback on energy related equipments?

13(ii). If Yes, when did the Company implement these Policies?

13(iii). Could you give me some examples of the kinds of Policies under which you operate?

14. To meet the increasing cost of electricity which of the following measures do you take?

- a. Conduct energy audits
- b. Periodic readings of the electric meters
- c. Look into the various electric rate options
- d. Keep a close watch on the Demand rate
- e. Calibration of the meters
- f. Energy conservation instruction to the employees

14. (continued)

- g. Inspection of the electric appliances
- h. Inspection and strict control of the HVAC System
- i. Use of 'economizer' equipments
- j. Hire outside consultants to evaluate and suggest remedial measures
- k. Any other measures

15. Recently a number of Codes have been modified or promulgated. A number of these Codes have a great impact on the use of Electricity by the hotels. Some of these Codes are, A.S.H.R.A.E. 90-75-76...., Modification of the Model Life Safety Code, i.e., Emergency Building Temperature Restriction Modification of the Public Health Code related to the minimum temperature of water for rinsing, etc.

How do these Codes affect your Property?

A.S.H.R.A.E. 90-75-76..

Emergency Building Temperature Restriction

15. (continued)

Public Health Code

16(i). Has the increasing electricity cost, increased, decreased or has not affected the Building operation maintenance?

16(ii). If increased or decreased, then by how much?

1977-78

1978-79

1979-80

1980-81 (expected)

17(i). Has the electricity cost as a percentage of Net income increased, decreased or remained the same?

17(ii). If increased or decreased, then by how much?

1977-78

1978-79

1979-80

1980-81 (expected)

APPENDIX GMETHOD OF DETERMINING EXACT ENERGY
CONSUMPTION BY VARIOUS DEPARTMENTS

<u>Hotel</u>	<u>Yes</u>	<u>No</u>
1	-	x
2	x	-
3	-	x
4	-	-
5	-	x
6	-	-
7	x	-
8	-	x
9	-	x

APPENDIX HENERGY CONSUMPTION
ALLOCATION

<u>Hotel</u>	<u>Yes</u>	<u>No</u>
1	-	x
2	-	x
3	-	x
4	-	-
5	-	x
6	-	-
7	x	-
8	-	x
9	x	-

APPENDIX IELECTRICITY USAGE (%) BY ROOMS
AND OTHER DEPARTMENTS

<u>Hotel</u>	<u>Rooms</u>	<u>Other</u>
1	N O T D I V I D E D	
2	95	5
3	70	30
4	75	25
5	75	25
6	85	15
7	85	15
8	80	20
9	80	20

APPENDIX JENERGY BUDGETING

<u>Hotel</u>	<u>Yes</u>	<u>No</u>
1	-	x
2	x	-
3	x	-
4	-	-
5	x	-
6	x	-
7	x	-
8	x	-
9	x	-

APPENDIX K

GUIDELINES BY CORPORATE OFFICE
FOR ROI/PAYBACK PERIOD

<u>Hotel</u>	<u>Yes</u>	<u>No</u>
1	-	x
2	-	x
3	-	x
4	-	-
5	x	-
6	-	-
7	x	-
8	x	-
9	-	x

APPENDIX LFORMS OF ENERGY USED

<u>Hotel</u>	<u>Electricity</u>	<u>Nat. Gas.</u>	<u>LPG</u>	<u>Fuel Oil</u>
1	x	x	-	-
2	x	-	x	x
3	x	x	-	-
4	x	x	-	-
5	x	x	-	-
6	x	x	-	-
7	x	x	-	-
8	x	x	-	-
9	x	x	-	-

APPENDIX MPERCENTAGE OF EACH SOURCE
OF ENERGY USED

<u>Hotel</u>	<u>Electricity</u>	<u>Nat. Gas.</u>	<u>LPG</u>	<u>Fuel Oil</u>
1	83.0	17.0	-	-
2	82.0	-	8.0	10
3	76.0	24.0	-	-
4	95.0	5.0	-	-
5	90.0	10.0	-	-
6	90.0	10.0	-	-
7	61.5	38.5	-	-
8	90.0	10.0	-	-
9	80.0	20.0	-	-