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**The Electricity Consumption Patterns of Greater Boston Non-Profits**

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Submitted to the Department of Urban Studies and Planning  
in Partial Fulfillment of the Requirements for the Degree of

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Submitted to the Department of Urban Studies and Planning on May 29, 1997  
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## **ABSTRACT**

On January 1, 1998, the Massachusetts Department of Public Utilities will implement restructuring in the electricity industry in the state of Massachusetts. One of the aspects of the restructuring includes the purchasing of power sales between the generator and the end user. This competition creates the opportunity for cost savings.

This increased competition will hopefully lead to lower prices for electricity. One of these new supply competitors in the electricity sales industry is a power marketer, or an entity who buys and sells electricity. To maximize the discount power marketers can give to customers, power marketers have begun to aggregate, or group, electricity users together.

This thesis reviews the possibility for aggregation by Greater Boston non-profits in the United Way Massachusetts Bay (UWMB). To do this, the primary data gathered through a survey of a sample of non-profits in the UWMB is analyzed.

The thesis concludes with an analysis of factors which the UWMB or any trade association would need to assess before deciding if they want to aggregate, and finally recommendations to the UWMB.

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## CHAPTER ONE

### Introduction

#### 1.1 Significance of the Issue

Non-profits play an active role in community development. There are three major benefits to community development which are created through the restructuring of the electricity industry: cheaper electricity, better service, and the potential of spin-off business which will create jobs. This paper will focus on the restructuring of the electricity industry and how it will lower electricity rates. In particular I will focus on aggregating (grouping together of non-profits) as the means to further increase the savings that non-profits will receive on the cost of their electricity.

At present, electricity costs vary widely within the state, and therefore expected savings from restructuring will also across the states. One observer estimated, "If utilities were deregulated, electricity customers would save about 26% from their 1994 bills" (Belton, 1996). For example, in Massachusetts, consumers' bills, would decrease from an average of \$61.90 to \$45.72. One of the new competitors in power sales is a power marketer.

Power marketers buy and sell electricity for a price and wheel it to end-users at substantial savings. This is a satisfactory way to purchase electricity for consumers using large quantities of electricity, e.g., retail chains and manufacturers. However, if a small electricity load-user, e.g., a small business or a non-profit

organization, wants to purchase electricity in an attempt to reduce electricity costs, it should aggregate its individual electricity loads to negotiate bulk electricity prices. By gathering customers into a single buying block, or an aggregation, the aggregator can purchase electricity at competitive and even substantially discounted prices.

Non-profits could benefit by saving approximately 20% on their electricity bills. For most of the non-profits who responded to my survey on non-profit electricity consumption, (discussed in Chapter 2), this could mean savings of \$400-\$14,000. If the non-profit is an off-peak user (electricity usage after 8PM, or 24 hour or weekends), such as a multi-service center or shelter, or community development corporation(CDC), the savings are even greater because off-peak usage after 8 PM translates to an even less expensive rate for electricity.

## **1. 2 Thesis Question**

As January 1, 1998 approaches, retail power marketers will be attempting to carve out market niches in the electricity wheeling business (buying and selling of electricity). Power marketers have already targeted refineries, industries, and large manufacturing companies that represent some of the largest electricity loads. This market of large users is limited, however, and over time, power marketers will have to look at a variety of different customer sectors to remain profitable. These sectors include retail shopping malls, property management companies, and non-profit organizations. Many non-profits might be overlooked initially because their individual loads are small, but collectively, they not only represent a sizable electricity load themselves, but they are also a potential pathway into the lucrative

residential market. Currently, little research exists on the potential to aggregate non-profits in this \$200 billion power sales market. Therefore, since current information mainly encompasses power marketing, the research represented in this thesis seeks to fill the information void by gathering data on electricity aggregation, particularly as it pertains to non-profits. This brings me to my thesis question: Is there a potential for non-profits in the Greater Boston area to aggregate their demand for electricity in Massachusetts?

Non-profits, due to their load profile( characteristics which make up an electricity load), have the potential to aggregate. I will explore the potential for power marketers to aggregate non-profit electricity customers as a market for power marketers.

Aggregation is one technique the power marketers can use to provide a discount to their customers. An aggregation can attract lower-cost suppliers due to the size of the group and its combined electricity load factor.

### **1.3 Opportunity**

Deregulation will create an electricity industry with three distinct parts: (1) generation, (2) transmission, and (3) distribution.

In particular, restructuring the current industry will create opportunities; in power sales these business opportunities will include renewable energy sources, metering services and billing services. In a \$200 billion market, retail wheeling is an opportunity that is less capital intensive and has smaller barriers to entry than generation (the production of electricity), which is capital intensive. Currently,

retail wheeling is being conducted by power marketers in pilot projects in states such as New Hampshire, Massachusetts, and California. While the existing network of high-voltage transmission lines will remain essentially unchanged and will continue to be operated by state agencies or regulated companies, restructuring will allow power sales companies to flourish. Public Utility companies will be required to open their systems to competing suppliers in the same way that local phone companies now allow long distance carriers to use their lines. After the electricity industry restructuring generators will compete to sell power in a spot market much like a commodities exchange. Retail providers will buy (electricity)power wholesale and market it to households and other commercial users, e.g., businesses, industries, retail outlets, or non-profits. Between the two electricity industry segments, generation and distribution, will be transmission companies who will charge wholesalers and retailers access fees to use their lines.

#### **1.4 Methodology**

To assess the capability of non-profits to aggregate, I have surveyed 19 non-profits in the greater Boston area which are members of the United Way. I used the method of convenience sampling to gather data on electricity consumption of the non-profits and used this data to make assessments, recommendations, and conclusions on the feasibility of aggregation for United Way non-profits.

In order to arrive at a conclusion regarding whether non-profits can be aggregated, it is important to discuss the impact of Federal legislation, Massachusetts legislation, electricity industry changes, power marketing , aggregation, and the

overall benefits of deregulation. Most importantly, I will discuss the benefits of non-profits self-aggregating and the reasons why power marketers should consider non-profits as a viable market.

## **1.5 Federal Background**

The Environmental Protection Act of 1992 was a national catalyst for industry deregulation, allowing private, non-utilities to acquire or build generation facilities that sold only wholesale electricity. But more specifically, it created the Federal Energy Regulatory Commission (FERC), Order.888, which guarantees the right to access transmission lines for electricity not owned by utilities (Saunders,p.18). Order.888 effects restructuring and allows large consumers and power marketers to buy electricity from any generating source and transport it over the transmission lines.

## **1.6 The Massachusetts Regulatory Environment**

The Massachusetts Department of Public Utilities(MDPU) was cognizant of the national trend of the Federal Energy Commission. Over the last five years the MDPU has also sought to restructure the Massachusetts electricity industry, because in this new industry the power sales regulation will be shaped by the states. The MDPU wanted to lower prices for a variety of customers. The MDPU's restructuring guidelines in 96-100 articulates the following concerns.

Challenges to regulation have intensified in recent years as growing numbers of large industrial and commercial consumers, aware of new supply options available to them, have become unwilling to pay the costs assigned to them under the monopoly framework, and demand relief from utilities. These larger customers,

e.g., refineries and manufacturers who hold significant leverage over utilities due to their usage, have succeeded in obtaining discounts, while smaller customers have found no relief from the high rates that have resulted from traditional cost-service regulation (MDPU, 1996).

In order for customers to have cheaper prices, electricity deregulation in Massachusetts seeks to create a market framework which will deliver enhanced benefits to consumers in the form of lower costs, broader choice and increased efficiency (MDPU, 1996)

To create a more competitive system the industry will be restructured. The MDPU outlines to the Massachusetts customer the changes in the Federal and state roles and how direct access will change customer's purchasing choices.

The Department of Public Utilities will deliver direct retail access on January 1, 1998. Direct retail access allows consumers to purchase their electricity from a variety of electricity suppliers including but not limited to power marketers. Fees to transmit electricity, or access charges, will be regulated by the Department of Public Utilities, as will the charges for distribution. Transmission charges will be overseen by FERC. In the restructured electricity industry, generation will become competitive. Customers will be able to buy generation service through a competitive electricity supplier. The MDPU will no longer set rates for power; instead, a generation market will develop where companies aggressively compete to sell power, which should result in lower prices to generators. This savings by generators will be passed on to customers.

### **1.7 Savings Incurred for Large Users Through the Bulk Buying of Electricity**

Traditionally, discounts in pricing have been targeted at the refining and manufacturing industries; for example, NEPOOL in Massachusetts targets mostly large industrial businesses. According to Jeffrey K. Skilling, CEO of the Enron Corporation, a leading company in the power marketing business, "utilities have been offering special discounts for years. Indeed, between 1990 and 1995 industrial rates fell while commercial and residential rates have increased by 5% and 7% respectively; industrial customers aren't shy about pressing their advantage."

"Agreeing, Philip Giudice, vice-president, with Mercer Management Consulting Inc.

in Lexington, MA added, "Smaller customers need to form buying consortiums so that they, too, can drive hard bargains. Power marketers have gone after users such as municipalities, shopping malls, and large industrial users, too, in hopes to lock in another sector of large energy load users." On September 7, 1995, UtilCorp United (UC) agreed to become the sole energy supplier for Service Merchandise Co.

Although initially UC agreed to provide natural gas to only 25% of Service Merchandise retail outlets, ultimately the agreement will cover all of the retailer's 406 outlets in 37 states. In addition, the agreement allows for UC to become the retailer's supplier of electricity as deregulation occurs. The bulk purchasing of electricity is a cost savings that has worked for business, and the same methods could be applied to a group of non-profits.

## **1.8 Power marketing**

Power marketers function as brokers of electricity between the generation companies and the customers. Some of these customers will be refineries, some manufacturers, and ultimately the market will go to residential electricity customers. The power marketer will look at how efficiently it can secure a large market share, and one of the mechanisms to do that is aggregation. To secure a sizable market share it would be to the advantage of a supply competitor to buy and sell a large load of electricity, or increase demand. This increase in demand would mean an increase in consumption, which would allow a power marketer to exercise more control of the market.

A whole new class of participants will come to the fore in the next five years: power marketers who may or may not own generating plants. They will attract customers by offer of lower electricity rates; they will then obtain power from either their own plants or on the open market. To win customers' loyalty, power marketers can offer customized pricing plans, such as discounts for using electricity at night, or for agreeing to accept a service interruption at times of peak demand.

Power marketers will deliver electricity using competitors' wires, just as the old Bell Telephone system was required to let NCI Communications Corp., and other long-distance services, use its phone lines to deliver calls.

Overall, power marketing is growing at a rapid pace. The combined sales of power marketers in the first half of 1995 totaled 65.5 billion kwh(kilowatt hours), outpacing sales of 28 billion kwh during all of 1994. Still, that's only about 1.4% of all wholesale electric usage, which stood at 1.9 trillion kwh last year.

A power marketer can reduce a consumer's electricity costs because "a marketer lacks generation assets and it can combine one utility's peak prices with another utility's off-peak prices to deliver electricity at a cheaper price per kilowatt hour. By virtue of the fact that the marketer is not tied to any set of assets, such as traditional services, it is free to pick and choose any established utility's output one day, and another utility's output the next day in order, to get the best possible price" (Spiewak, 1997).

## 1.9 Non-Profit Aggregation

The smaller consumers, such as small businesses and non-profits, remain largely untapped as potential markets for electricity aggregation. Mitch Rosenburg, an electricity analyst at Xenergy, in Burlington, MA believes that "non-profits loads are so small that unless you target those who use electricity at night, the small non-profits will not benefit from aggregating in power sales." For, example Enron Capital and Trading, which currently sells gas to the Chicago Archdiocese have entered into a new discussions with the Chicago Archdiocese to sell electricity. What makes the Archdiocese a strong case for aggregation is that (1) its non-profits are directly consolidated under the Archdiocese's umbrella, and (2) it is the largest land owner in Chicago.

What further complicates the case of whether non-profits are an important market is the lack of data available on the use of electricity by community-based non-profits. I am interested in non-profits because they represent a vital "infrastructure" in community development, and they are constantly looking for cost-cutting mechanisms for their organizations. The potential savings from electricity aggregation could be used for organizational programming.

The last advantage of power marketers targeting non-profits is the positioning for open retail access to the residential market. Non-profits could serve as a leverage marketing base for future residential users because non-profits serve hundreds of potential electricity users everyday and these residential users might be more likely to sign up with a power marketer if they know a neighborhood non-

profit is also a customer of that given power marketer. The relationship of the household customer to the non-profit organization might be formalized through a fund-raiser. For example a commission could be given to the non-profit for each client the non-profit gets to sign up for the specific electricity service. For example, the telephone industry baby bells"(small long-distance companies) have enlisted the help of churches to sell their long distance service and, in return, the churches receive a commission on each bill.

The changes in the electricity industry present an opportunity for cost savings for a variety of customers. Non-profits are customers who, if aggregated, can receive a substantial savings on their electricity. The ability of non-profits to aggregate will take place around certain characteristics they have such a type, square footage, usage, etc. To gain a better understanding of this market I conducted a survey, and I discuss the results and the methodology in Chapter 2.

## CHAPTER 2

### METHODOLOGY AND RESULTS

Since there is little data on non-profit electricity usage, I conducted a survey to obtain primary data on non-profit electricity consumption. I used this data to assess the potential to aggregate non-profit organizations. This chapter discusses the methodology I used to gather the data, and the results of my exploratory study. Before I continue with the methodology and results, it is necessary to define a few of the terms which I will be using they include Non-Profits and community Based Non-Profits. A Non-Profit is a charitable organization, with a 501(c)3 Federal charitable status, which does not generate a profit through its programming. In general, an organization must apply for 501(c)3 status. Community-Based Non-Profits are non-profit organizations which are geographically located in a residential area.

#### **Methodology**

The purpose of my survey was to assess the electricity consumption patterns of non-profits. The population that I chose to study was the United Way of Massachusetts Bay (UWMB). I chose this population because I realized that its geographic area included Greater Boston. Boston was chosen because it is an area rich with non-profit organizations, and because I was familiar with some of those

non-profits. The population was made up of non-profits in 81 cities and towns within the Boston Metropolitan area.

According to Sarah Ellwood of the United Way, there are two primary types of groups that the United Way funds: Health Prevention and Human Services. In addition, I categorized the Health Prevention and Human Services types further into groups based on the primary issue they addressed. These non-profit issue groups are labeled 4-9: Youth (Type 4), Housing Advocacy (Type 5), Visiting Nurses Associations (Type 6), Other (Type 7), Community Development Corporations (Type 8) and Women's Shelters (Type 9).

Youth organizations are groups whose primary mission is the development of youth. Housing Advocacy organizations work with housing residents to improve the quality of life and issues concerning housing. The category of "Other" includes a variety of non-profits who indicated "Other" on the survey; they ranged from multi-service centers (a place which implements a variety of programs affecting a local community, such as job training, senior activities, and after school programming) to a Surplus Food Distributor who distributes food to supplement people's daily nourishment. A Community Development Corporation is an organization which develops a community's infrastructure through the building of housing, economic development, and neighborhood related work.

Human Service organizations are groups whose primary purpose is to aid in facet(s) of human development. A Women's Shelter is a temporary residence where women receive services and support around issues of domestic violence.

## 2.1 Survey and Sampling Method

I prepared a survey that would determine electricity usage, agency characteristics that might influence usage, and the potential and willingness to aggregate electricity usage. The voluntary survey was submitted via fax. I chose a non-probability method of sampling, convenience sampling (Fink, 1995). It relied on readily available individuals, in this case non-profits. This study was not designed to assess causal relationships. Its purpose was to conduct exploratory data analysis to examine trends in non-profit electricity consumption, such as market size, predictors and patterns of usage, and how non-profits would organize to take advantage of the deregulated industry. (A copy of the survey instrument is enclosed in the appendix).

To conduct analysis I found kwh and amount paid for electricity to be pivotal questions to be answered on my survey. The groups who did not answer questions about kwh hours/year or total bill per year were excluded from the following analyses. The remaining data yielded a final sample size of 19 groups. Data collected from the survey was analyzed in order to learn about the electricity usage of non-profits from the UWMB.

## 2.2 Sample

Out of 189 potential groups, the survey was faxed to 90 groups, 25 of whom responded at least partially (not all groups returning the survey answered all questions). For any question, a particular non-profit could be either a 1) Respondent or a 2) Non-Respondent. Respondents were the non-profit groups who submitted and answered the particular question on the survey. Non-Respondents were non-profit organizations in the sample who left the question blank.

For each question, along with the data, the Respondents are indicated by the letter "R" while Non-Respondents are indicated by "NR."

## RESULTS

In this section, I will present data analysis of survey responses in 3 areas:

- ◆ The overall characteristics of the survey Respondents
- ◆ Electricity usage and demand
- ◆ Factors that might influence a non-profit to use a supply competitor, e.g., a power marketer or an electricity cooperative.

## 2.3 General Characteristics

### *Survey Respondents*

On the survey I listed the following categories for non-profits to use to describe themselves: Religious Organization, Health Care Center, Day Care, Youth, Housing Advocacy, Visiting Nurses Association, Community Development

Corporation, Shelter/Transitional Housing, Long Term Residential, Civic Association, Legal, YMCA, and Other. After distributing the survey, I received the 19 responses from: 2 Youth organizations (Type 4), 1 Housing Advocacy group (Type 5), 1 Visiting Nurses Association (Type 6) , 8 groups who listed themselves as "Other" (Type 7) , 1 Hearing Impairment Organization, 2 Mental Health Centers , 1 Surplus Food Distributor, 4 Multi-Service Providers, 6 Community Development Corporations, and 1 Women's Shelter.

Before I can proceed to non-profit electricity usage, and what factors influence non-profits to join an electricity cooperative/power marketer, it is essential to elaborate on some of the fundamental characteristics of the sample.

#### *Employees*

The average number of employees at the non-profits surveyed was 59. The largest employer was the multi-service center with a staff of 400. The smallest was a CDC with 11 employees. A traditional means of assessing the size of a business or institution is the number of employees. It is understood that the more employees a firm has, the more space and materials and resources it will consume, one of those resources being electricity. Thus, a firm with a large number of employees might have higher amount of electric usage. However the correlation between the number of employees and electricity usage in kwh/years, based on the 16 non-profits who answered both questions, is .18. The correlation coefficient indicates a modest positive relationship between employee size and electricity consumption.

#### *Real Estate Ownership/Rental*

There are two major ways non-profits can pay for electricity: a) they can pay for their electricity directly, or b) they can pay a management company. Whether a non-profit owns property or rents can affect whether a non-profit is paying a utility or a management company for its electricity. In the sample, 93% of the non-profit owned at least one or more buildings, while 38% rented one or more buildings. These two figures add up to more than 100% because a single non-profit can both rent and own buildings. Of the Respondents in my sample, 81% of the owners paid for their electricity directly to a utility and 19 % paid a management company. In addition, not all non-profits in the sample reported all of their buildings. For example, CDCs did not report all of their locations. An ownership market is a much less mobile market than a renter's market.

Of the renters, 75% paid for their electricity to a utility company and 25% paid a management company. Even when renting, a majority of the non-profits paid for their electricity directly to a utility company. If renting, the non-profit could have a significant influence on who the management company chooses to serve as a power supplier. For example, in one CDC, there was a limited partner relationship where the executive director's and the board's opinions shaped the actions of the limited partnership. This limited partnership included a management company. Therefore, if the executive director wants to purchase electricity from a particular supply competitor, the limited partnership will purchase electricity from the same electricity supply competitor.

In assessing both renters and owners and who they pay for electricity, whether non-profits rent or own, a majority 79% of the sample paid their bills to a utility while only 22%, paid their bills to a management company.

### *Square Footage*

The non-profits were divided into 3 groups when discussing square footage. Eighty-two percent of the groups in my sample were small non-profits (sq.ft.=2,500-22,500). Two were medium(sq.ft. = 22,501-43,500) and 1 was large (sq.ft.=43-501-66,000). My sample had a disproportionate amount of small non-profits (sq.ft.=2,500-22,500); however, not all the non-profits submitted their total square footage. If my sample reflects the groups in the UWMB accurately, most non-profits are probably relatively small in terms of square footage.

## **2.4 Usage**

### *Kilowatt Hours*

The total annual electricity usage of the sample organizations was 1,970,583 kilowatts of electricity. The average use was 123,161 kilowatts per year. Sixty-four percent of the sample used less than 68,000 kwh annually. The largest user was the Surplus Food Distributor, which used 450,000 kwh annually, and the smallest was a Youth organization which used 16,500 kwh annually.

### *Electricity Usage By Kilowatts and Square Feet*

Only the non-profits who indicated square footage were used to calculate how much electricity small, medium, and large users consumed in relation to their

size. Non-profits with a large amount of square footage tended to consume more electricity, with a usage equal to the usage of several small users. Usually a power marketer targets the large users first, viewing them as more profitable and cost effective, since one large non-profit can consume as much electricity as several of the small non-profits as indicated in my data.

#### *Annual Electricity Expenditures*

The total annual amount that the sample spent on electricity was \$280,987. This number does not equal the kilowatt total at the bottom of the previous chart, because it also reflects Non-Respondents. The lowest and highest amounts spent were by two multi-service centers at \$2,065 and \$70,553, respectively. Fifty percent of the sample spent over \$10,000 on their electricity bills in 1996.

#### *Type of Non-Profits and the Amount They Pay for Electricity Annually*

##### **Cost of Electricity**

The group of organizations with the highest bills, at \$177,376, was "Other," which had a variety of issue groups which fell into the general category of Human Services. There is, however, a disproportionate amount of the "Other " groups; this could account for the large dollar amount. Second were CDCs which accounted for 29% of the total electricity sample billing. Their large usage lies in the vast amount of buildings they own which have night and/or 24hr. usage. The third largest user

was a single non-profit women's shelter, which paid 5% of the sample's total cost of electricity. A women's shelter is a non-profit with several facilities, usually; these can include office space, residential housing for the clients, e.t.c., all with a single billing address. However, some may be larger than the data suggests because they have multiple buildings which were unreported and/or limited partnerships. A women's shelter is a good example of multiple buildings owned by one non-profit.

### *Predictors of Usage*

A correlation coefficient was used to assess which independent variables (sq.ft., employment) were associated with high electricity usage. The variable with the strongest relationship was total sq.ft with a correlation of .90. The second most significant variable was employee size with a correlation coefficient of .18 . These results suggest that the amount of square footage occupied is one of the best predictors of electricity usage.

### *Amount of Kilowatts Used By A Non-Profit*

Non-profits who indicated themselves as " Other" consumed the majority of kilowatts at 64%, followed by CDCs at 30% and Shelters at 4.4%. The organizations which listed themselves as "Other" used 1,257,707 kwh in all; Community Development Corporations used 588,462 kwh; Shelters used significantly less, 87,136 kwh, followed by Youth groups and Housing Advocacy groups, both of which used 15,647 kwh, or .8% of the sample's total usage. The usage of "Other"

and CDC as previously maintained was large because they have a large number of buildings with night and 24 hour usage. In addition, the sample had a disproportionate amount of groups falling into the category of “Other” and “CDC” while the other categories, such as Youth, Housing, Advocacy, VNA, and Shelters, had fewer respondents.

#### *Payment to Electricity Management Company or Utility by Type*

Eighty-three percent of the non-profits who responded to the survey paid their electricity bill directly to a utility. Seventeen percent of our sample paid their management company for electricity (the management company then pays the utility). Upon examining the data further, Youth , VNA and, Shelters paid most of their electricity bills to a management company, primarily for the upkeep of the apartment buildings and other multi-unit dwellings.

#### *Type of Agency and Time of Usage*

Time of day was examined because of the comments of a Xenergy analyst who felt that “non-profits were not attractive to electricity supply competitors if they don’t have night usage.”

One of the major advantages of the electricity restructuring is the lowering of electricity rates. Presently, all electricity customers pay one rate regardless of what

time they consume electricity. The peak hours of consumption are 7AM-7PM. In a deregulated electricity market the rate for electricity lessens during off-peak hours (after 8PM-7PM). The non-profits in the sample were asked if they held their programming in the day, evening, 24 hours, or on weekends.

All agencies indicated that they were open during the day from 9AM-5PM. However, some non-profits also showed other patterns of electricity usage. Sixty-eight percent of the sample also reported night usage from 5PM to 10PM. Forty-four percent reported that they also used electricity on the weekends. Twenty-four percent of the Respondents in the "Other" and CDC categories had a great deal of non-day usage.

#### *Size of User in Kilowatts and Time of Usage*

Overall, after regular day usage, night usage (usage between the hours of 5PM-10PM) was the time period when the highest proportion of the sample is used electricity, followed by the weekends usage and 24hr. In the introduction I alluded to a comment made by an Xenergy analyst about night usage and the lack of potential for aggregating non-profits if they didn't possess night usage. Not all respondents answered that they had night, 24hr, weekend usage. The sample reflects that there is an 88% likelihood that a non-profit in my sample could be a night user.

The data indicates that 64% of the small users were night users; 18% were 24hr users; and 27% were weekend users. The medium and large users tended to be open on weekends and at night because of their similar programming patterns.

### *Size of Market*

The sample represents 10% of the UWMB non-profits. The average kwh per year for the 19 non-profits in the sample was 123,161. If the remaining UWMB non-profits have a similar electricity usage, then the total usage is 1.2 million kilowatts per year. "This size load would interest any power marketer and, everyone will be after the UWMB", stated Mary Smith, power marketer at Allenergy. "We are not only examining total kilowatts consumed but the factors such as off-peak or other usage patterns."

## **2.5 Influential Factors for Non-Profits in Electricity Purchasing**

### *Knowledge of Deregulation in 1998*

Sixty-five percent of the 17 non-profits who answered the square foot question knew about the deregulation in 1998. This indicates that my sample population is somewhat informed; however, nearly 40% are uninformed. Therefore, a power marketer will need to educate non-profit consumers while they are proposing their electricity rates to the non-profits. All non-profits in the sample were interested in taking advantage of the savings created by deregulation of the electricity industry and they would aggregate their usage for an additional 10% savings on their electricity (the two other groups in the survey chose not to reply).

### *Non-Profit's Initial Steps In Organizing In A Deregulated Electricity Market*

Since one hundred percent of the sample was willing to aggregate to save an extra 10% on their bill, it was also important to see what their initial step would be. Fifty-nine percent stated that they would need to seek more information, and another 59% would contact an umbrella organization. For example, a non-profit in my sample might contact the UWMB. Fifty-three percent stated that they would talk to other non-profits about buying in bulk. The data was examined for differences in the way non-profits would aggregate based on size. Seventy-three percent of the organizations would seek more information, which reemphasizes the “eduselling” of electricity (“Eduselling” is defined as educating the customer about the restructuring process, how it would benefit them and the market, before you sell the product). This is necessary because customers have traditionally paid their electric bill to a utility and may be wary of new electricity supply competitors. Next, people would “seek more information,” followed by talking to non-profits, and contacting an umbrella group. This was natural; when more non-profits become informed, they will try to get others to join with them. Next they chose “contacting an umbrella group” which indicates that non-profits would like to see a coalition take the role of the organizer. Forty percent of the small users felt that they would contact an umbrella group; this percentage was higher for medium and large users. In addition, the large non-profits have a lot more programs, therefore more billing and meters to contend with, making the process of the assessing gathering information seem overwhelming.

## **2.6 Qualities that Non-profits are Looking for in their Electricity Supplier**

After assessing whether the non-profit is a small, medium, or large, (based on square feet), the desired qualities in electricity suppliers were investigated. The data showed that those non-profits which use between 14,000 and 159,000 kwh value the experience and the reputation of the power marketer most, followed by the reliability of the company, and then name recognition.

### *Decisions to Purchase Based on Size and Square Feet*

When examining if size has an impact on how the sample chose an electricity supply competitor, all size organizations felt strongly about the reputation and experience of the aggregator (an average of 67%). This was followed by the reliability of the company 43% and the name of the company (9%).

### *Green Electricity Usage and Size in Square Feet*

Sixty-eight percent of the non-profit organizations indicated they would buy green electricity (electricity which is generated from solar, thermal, wind generators). Medium users were somewhat less likely to be willing to use green electricity than the overall average of 68%.

*Non-profit's ranking of the qualities that they would use to chose a long distance telephone service*

Many liken the changes which are happening in the electric industry to those which have happened in the field of telecommunications. To understand how non-profits will choose an electricity supplier, a question was asked about how the non-profits chose their long distance telephone services .

The most important quality was the “price” of the service, followed by the “reliability” of service, and then the “quality “of service. A non-profit would want to chose an aggregator who carries electricity products and has services which are cost competitive, and who values reliability and quality of service.

### CHAPTER 3

#### CONCLUSIONS AND RECOMMENDATIONS

The results of data gathered in Chapter 2 overwhelmingly suggest that aggregation would be beneficial to the UWMB and the non-profits they serve. Since I focused on the United Way Massachusetts Bay(UWMB) as my sample I will focus on the UWMB in my conclusions. The conclusions will focus on the important issues that the UWMB needs to consider before engaging in the bulk purchasing of electricity.

These issues include: (1) UWMB Role: As either a buying group organizer or as an aggregator of electricity. (2) The need for consumer education on the cost savings obtained by aggregating and the changes in the structure of the electricity

industry (3) Membership in a bulk purchasing mechanism; (4) Pricing of Electricity; (5) Type of electricity to be purchased by a power marketer; (6) Selection of a power marketer. In the following sections I will elaborate on these points.

### **Role of the United Way**

One of the first issues that the UWMB must grapple with is whether they would like to assume the role of electricity aggregator or of the coordinator of a buying group. In becoming an electricity aggregator the entity would assume the larger responsibility than in a buying group. Being an aggregator entails the buying and selling of electricity from a (power marketer or generator), scheduling the delivery of electricity from the supplier, and setting the price of the electricity. In contrast to a buying group which coordinates a group of electricity consumers, develops a membership policy and works with a power marketer who serves as the aggregator.

### *Aggregator*

If the UWMB becomes the aggregator, the benefits to the UWMB include revenue, reduced electricity costs and “trust” through a preexisting relationship. If electricity was sold from the UWMB to its non-profit affiliates the UWMB could marginally increase the price for the electricity and garner increased revenue from the sale. The UWMB could justify this mark-up in price by maintaining that it is necessary to cover administrative costs. There might also be the possibility to sell this electricity to other non-profits outside the UWMB system. This could create extra revenue for the UWMB.

Another advantage of the UWMB serving as the aggregator is the perception of a cost savings. If the UWMB is the aggregator there is an impression that the cost of aggregating the electricity sold to the non-profits would be less expensive if the aggregation is done "in house" by the UWMB. However, I understand that there are some costs incurred with the UWMB serving as the aggregator. If these costs don't outweigh the revenue then aggregation may prove to offer financial advantages.

By serving as an aggregator the UWMB could leverage its existing relationship and trust with its member agencies to gain greater participation and a larger buying group. Purchasing electricity from an entity which is not a utility will be a new experience for most non-profits. Responses given by the sample of non-profits revealed that these non-profits wanted to purchase electricity from a power marketer who is "reliable and cost conscious." There are factors that suggest the UWMB possesses this reliability and a concern with these cost issues. For example, the non-profits in the UWMB have received consistent funding. The fact that the UWMB has regularly funded the sample of non-profit organizations indicates reliability. In addition, the non-profits recognize the UWMB's cost consciousness through its rigorous funding standards. Therefore, the non-profits in the UWMB may be more ready to trust the UWMB to aggregate their electricity.

However, aggregation also presents disadvantages. One such disadvantage is the complexity of the marketplace. Electricity is a technical industry and it takes a great deal of savvy to understand its nuances. Some of these nuances are revealed

in the questions that experts must inevitably have to answer in the wheeling(buying and selling) of electricity. In general these include:

- ◆ What is the electricity load profile of the member non-profits and of the aggregation as a whole?
- ◆ Are we getting the best price for wholesale electricity?

In particular for the UWMB:

- ◆ Will the power suppliers really take a non-profit's request seriously?
- ◆ Does the UWMB have enough knowledge of pricing, or could the UWMB be susceptible to bad deals and not realize it?

Experience is important in this field. As these questions reveal, without an adequate understanding of aggregating in this newly restructured electricity industry, success may prove difficult to achieve. Market complexity paired with lack of experience leads to the ultimate problem of financial risk. In aggregation, the aggregator assumes fiscal risk because the aggregator entity which who purchases and sells electricity for the member groups. For example, if the aggregator unknowingly is overcharged for electricity over a period of time, the member agencies might not want to pay for that mistake. Another example is a confusion in the electricity delivery schedule; if the delivery is incorrect and impacts programming at an agency, the aggregator could be held legally responsible by the member agency, encouraging law suits.

Another disadvantage of aggregating is the responsibility aggregators have to the non-profits; "this is not like selling candy bars," admitted one power marketer.

As this power marketer recognizes, wheeling electricity, and the responsibility of delivering electricity, lies with the power marketer or the electricity supplier, who recognizes that a failure to deliver electricity can have serious consequences for a number of non-profits who rely on the UWMB for aggregating electricity. As a result, if the UWMB were to become an aggregator, it would have to recognize that a mistake, such as the failure to deliver electricity, could jeopardize its relationship with these non-profits. Such an error could have further ramifications for the relationship between the UWMB and the non-profits it serves. For example, funding relationships, the main focus of the UWMB's mission, could become contentious.

A final disadvantage is that of confidentiality. The issue of confidentiality raises the question of how much information a non-profit would have to release to purchase electricity from an UWMB aggregator.

Specifically, someone might disclose information, such as bill history, in a manner that might impact the non-profit's funding relationship with the UWMB. Would the discount on electricity ultimately lead to a decrease in the UWMB's overall funding of a given organization? For example, one of the non-profit hesitated to fill out the survey, not knowing if the United Way would receive the information on any data I collected from the non-profits that disclosed their names.

### *Coordinating a Buying Group*

The other option for the bulk purchase of electricity is the UWMB organizing a buying group. In this case the UWMB would work with their member non-profits

to structure a purchasing group and use this purchasing group to enter into a relationship with a power marketer. However, the UWMB would not purchase electricity or be responsible for the delivery of electricity. The advantages of functioning as such a buying group include: better technical assistance, less responsibility and exposure to risk, and reduced expense. In understanding the comments of the power marketer who noted that “this is not like selling candy bars” we realize that electricity is a technical field. Extending the analogy, we come to understand that it takes relatively little expertise to sell candy bars and just about anyone could do so quite successfully without retail or sales experience. People do not care about how they get the candy as long as they get it. This is different for electricity sales because non-profits, who need electricity for daily functions in their organizations, want some assurance that this service will be consistent since it is vital to the operations of their organizations. In addition, a significant number of the non-profits wanted to purchase their electricity from with experience and who demonstrates the reliability. A power marketer is someone who comes with the experience of pricing electricity, and buying and determining rates, which are both key factors in the purchasing of electricity. This is unlike purchasing candy bars, for without a power marketer or access to someone with knowledge of the field, the purchasing could be problematic.

An additional benefit of forming a buying group is a lower risk. There is less risk in serving as a buying group because the UWMB is not actually purchasing the electricity nor is it responsible for electricity to be delivered to the non-profits. The

UWMB would hire an aggregator who would arrange with a generator the purchase and delivery schedule for the non-profits' electricity.

The other benefit that the UWMB could gain in starting a buying group is time. Although the buying group does take some time to get started, the pricing and purchasing would be done through the aggregator. This would take less staff time than that required if the UWMB were to develop as an aggregator themselves. The UWMB becoming the aggregator would prove to be time consuming because the UWMB has to gain knowledge of the electricity market while developing as the aggregator.

There are financial advantages and disadvantages to consider when looking at forming a bulk electricity purchasing mechanism. In a buying group the start up costs are less than those of an aggregator. The costs are less because the buying groups are less complicated to develop, there are fewer legal requirements incurred and the staff time is spent meeting with a power marketer which will take on the role of the aggregator for the buying group. This is in contrast with being an aggregator where the start up cost is large, because capital has to be raised to purchase electricity, an expert has to be hired who purchases the electricity and coordinates the delivery schedule for electricity.

The next financial consideration is revenue. If the UWMB functions as an aggregator the UWMB can add mark-up to the UWMB's cost of the electricity and earn a revenue. If the UWMB organizes a buying group the UWMB does not have the potential to gain revenue. In a buying group the size of the mark up is determined by the power marketer.

The next financial consideration is related to revenue and the amount of control over the cost of the electricity to the UWMB's non-profits. If the UWMB serves as an aggregator the UWMB will have greater control of the electricity cost for non-profits. For example, the UWMB as an aggregator might forgo the profit to pass on the savings to its member groups. In comparison to a buying group you can not trade off this revenue because it does not exist. It is absorbed because it is combined with the fee taken for the service the power marketer provides to the buying group.

## **Education**

The second issue that the UWMB must consider is the need to educate member non-profits about the opportunity to save money in the restructured electricity market. There are two types of education that need to be conducted: (1) Informing the non-profits about the changes in the electricity industry and the implications of the survey. The need for this initial education is indicated in the survey by 40% of the respondents not knowing that the electricity industry would be restructured on January 1, 1998. (2) How non-profits could benefit from the savings and what should be done to form a buying group. This is alluded to in the survey respondents' answer to the question, "knowing that the market will be deregulated and you would have the opportunity to shop with other non-profits to get a

discount what would your next move entail?” Seventy-three percent of the respondents stated that they would need to “seek more information” about shopping around with others. This information should detail how the purchasing mechanism (aggregator or buying group) functions, how the non-profits can get involved and further changes in the electricity industry that non-profits could benefit from.

The UWMB must then consider who will pay for this “support service” and whether the fee will be absorbed by the UWMB. Or another option allows for the non-profits to be charged a membership fee initially to cover the cost of education. The UWMB also needs to assess who will be responsible for educating the non-profits. Will education be left up to the aggregator, a consultant, or a UWMB staff person? How will the information be disseminated? Will it’s member agencies attend a few sessions then receive updates through a newsletter? And, finally, will these non-profits be educated on the benefits of joining the buying group? or will the information be channeled only to those who show interest and meet the criteria?

## **Membership**

The next issue that the UWMB must consider is whether the membership in the buying mechanism is open to every UWMB non-profit or whether there are restrictions based on usage. In contemplating which non-profits will be allowed to join will there be a minimum kwh requirement to join or a demonstration of off-peak usage? For example, a small user might not generate enough usage or revenue

to overcome the cost of administering their account. Another example in maintaining an optimal load profile (an electricity load with a certain pattern of off-peak usage and size users) is that the UWMB might not want every small daytime user to aggregate because it affects the load shape. This criteria for membership should be thought through carefully because it could create tension between the non-profits and the UWMB because it might not encompass all the groups and leave some non-profits feeling marginalized. This might be rectified with a sliding scale membership based on load profile.

## **Pricing**

The third consideration is pricing. The main question that pricing must address is whether pricing will differ by load profile within the purchasing structure. While this is largely a pricing issue it does relate back to education; if customers are well educated on how the electricity marketplace works they may be able to be convinced of the need to have a differential pricing structure to take advantage of the market.

One of the major reasons why the UWMB non-profits want to aggregate is to achieve a lower price for everyone in the buying group. In my sample the majority of non-profits were small with a few large users, and those small users had a unusual load profile. According to one power marketer, "Bigger is not always better, you can have an institution which has large usage but only consumes on

peak; we are also interested in loads who have unusual load profiles.”

Understanding that there are a variety of non-profits of varying load profiles and kwh usage, the UWMB has to grapple with a price structure where all can benefit. If the UWMB sets the price too high, the large users or those with an unusual load profile (such as those with off peak usage from 8PM-7AM) might determine that they could do better individually. Or if the UWMB sets an average price, another power marketer might “cherry pick”(target and recruit) through the members with more interesting load profiles. Another question related to pricing examines whether pricing will differ by consumption and load profile within the purchasing structure, How will the UWMB coordinate a price scheme for 189 non-profits, and will the group be able to take advantage of cost saving mechanisms such as off-peak usage and load interruption?

## **Type**

Another consideration is the type of electricity needed by the non-profits. Sixty percent of the non-profits did show some interest in the willingness to pay more for green electricity; however, they did not want to indicate how much more they would be willing to pay. Many were unsure because they didn’t know how much the increase in cost, for green electricity, would be.

## **Selecting A Power Marketer**

The last consideration is selecting a power marketer for the buying mechanism. There are three areas which the UWMB would need to look at in choosing a power marketer; they include: the criteria or standards that the power marketer/ electricity supplier will have, the length of the relationship, and the process by which the power marketer/ electricity supplier will be chosen. Criteria or standards that the power marketer/ electricity supplier will have include a minimum amount of years in the electricity business and experience in aggregation. In addition, the sample indicated that non-profit Respondents wanted to purchase electricity from an electricity supplier who values price and customer service, and who is experienced.

The next issue in the selection of a power marketer is the process by which the power marketer is selected. For example, the UWMB could have a consultant or individual review RFPs(Requests for Proposals) from power marketers and accept the best bid. Another approach may involve a working group of non-profits from the UWMB which would make a collective recommendation about which power marketer would be used.

The last issue is the length of the relationship with the power marketer. Some commercial users have indicated that they would like long-term relationship. The UWMB would need to assess if the they would like to undergo a probationary period and then a short term contract or one which lasts for a longer period of time.

There is a large potential cost savings in electricity aggregation for non-profits; while these issues may seem complicated they can be easily resolved and generate benefits for the UWMB and its membership.

## RECOMMENDATIONS

After reflecting upon my conclusions I am of the opinion that initially the UWMB and its non-profits should pursue the option of a buying group rather than acting as an aggregator/power marketer. The buying group is the best option because it has less risk, and responsibility, and it presents a smaller drain on resources. When the buying group shows promise the UWMB can opt for expanding into the role of aggregator. To develop the buying group I recommend the following steps:

1. Develop a working group of member agencies and staff about the idea of forming a buying group. For example these groups would research if this type buying group is taking place in another United Way.
2. Conduct analysis on how to solve the key issues raised in the conclusions. Use the experience from other buying groups and power marketers to inform this decision. Discuss the best ways to structure the buying group and membership criteria.
3. Hold an information session with all eligible non-profits by type, region, size (This would be a basic Q&A session about electricity market restructuring and the opportunity to form a buying group).

4. Bring on a consultant to conduct a needs assessment of the electricity load profile
5. Send out an RFP on your electricity load
6. Hire an competitive electricity supplier (power marketer).

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## APPENDIX 1. SURVEY SENT TO RESPONDENTS

March 18, 1997

1 Arcadia St. Apt. 1  
Boston, MA 02122  
(617)287-9308

Dear Executive Director:

Please help me in a very important survey that could possibly help your organization in the near future.

I am a second year graduate student in the Department of Urban Studies and Planning at MIT, and I am writing to ask for your assistance. Specifically, I am interested in learning more about your electricity use as a non-profit organization. On January 1, 1998 the US electricity industry will be deregulated allowing competition in the provision of electricity. This could produce substantial savings to non-profits on their electricity bill through bulk purchasing of electricity.

This feedback survey you fill out will help with my thesis where I will examine "The Electricity Consumption of Non-Profit Organizations in the Greater Boston Area."

I understand the importance of savings and budgeting in non-profits. Before attending MIT, I was Executive Director and founder of Part of the Solution, a non-profit, non-partisan voter mobilization group.

I have enclosed a brief (10-15 minute survey) on your electricity consumption to provide information for my thesis. You will have two weeks to fill out the survey. If you have any further questions please do not hesitate to contact me at (617)287-9308.

Sincerely,  
Theresa Reed

# NON-PROFIT ELECTRICITY SURVEY

I am undertaking a study of the potential for non-profits to bulk purchase their electricity. This survey will collect information needed for my thesis. Your time and help completing this survey is appreciated. Estimates are an acceptable response to questions.

INSTRUCTIONS: Please complete each question as fully as possible. All information will remain strictly confidential.

To return the survey, choose a manner which is most convenient for you:

FAX: (617)258-6067/(617)427-4823

MAIL: Theresa Reed  
Department of Urban Studies and Planning  
Massachusetts Institute of Technology (MIT)  
77 Massachusetts Ave.  
Cambridge, MA 02139

E-MAIL tlreed@mit.edu

## A. GENERAL INFORMATION

1. Name of Organization: \_\_\_\_\_

2. Number of employees \_\_\_\_\_

3. Name, address and title of the person who is completing the survey

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zip \_\_\_\_\_

4a. What type of non-profit organization are you?

Please indicate your organization by its primary function

Religious Organization _____	Community Development Corporation _____
Health Care Center _____	Shelter/Transitional Housing _____
Day Care _____	Long Term Residential _____
Youth _____	Civic Association _____
Housing Advocacy _____	Legal _____
Visiting Nurses Association _____	YMCA _____
Other _____	

4b. Please describe your organization's programs and services or attach brochures \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. How much space does your organization occupy? \_\_\_\_\_ sq.ft.

6. How many separate office space/buildings do you have? \_\_\_\_\_

7. List each property/office /building or commercial space which your organization receives a separate electricity bill from (For example if your main office is in one location and your satellite office is in another). Estimates are fine.

Building/Space1	Own _____ Rent _____ Square Feet _____
Buildings /Space 2(if applicable)	Own _____ Rent _____ Square Feet _____
Building/Space 3	Own _____ Rent _____ Square Feet _____
Building/Space 4	Own _____ Rent _____ Square Feet _____
Other _____	

**ELECTRICITY USAGE**

(Please feel free to attach a copies of your Electricity bill for each month of 1996; circle kilowatt hours and total bill for each month).

8. How many kilowatt-hours does your non-profit use annually? \_\_\_\_\_

9. How much does your non-profit spend on electricity annually? \_\_\_\_\_

10. Do you pay for your own electricity? Yes \_\_\_\_\_ No \_\_\_\_\_

11. Who bills you for your electricity usage?  
 Management Company \_\_\_\_\_ Boston Edison \_\_\_\_\_ Other \_\_\_\_\_

12. When is most of your programming held?(check all that apply)

		M	T	W	Th	F	Sat	Sun
Day	9AM-5PM	___	___	___	___	___	___	___
Evening	5PM-10PM	___	___	___	___	___	___	___

13. What type of systems or products consume electricity in your organization?

Heat _____	Electric Stove _____
Computers _____	Hot Water Heater _____
AC _____	Microwave _____
Coffee maker _____	Other _____

**SERVICE**

14. Does your non-profit participate in a wholesale buying arrangement?  
 Yes \_\_\_\_\_ No \_\_\_\_\_  
 (For example, some hospitals buy bulk tongue depressors)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(a) How did it happen?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) For what goods and services?

\_\_\_\_\_

\_\_\_\_\_

(c) Is this group purchasing agreement?:

Through your organization \_\_\_\_\_ 45 Through a trade association \_\_\_\_\_

Through another organization specify \_\_\_\_\_

15. Are you satisfied with current electricity supplier's service? Yes \_\_\_\_\_ No \_\_\_\_\_

16. How does your non-profit choose which long distance telephone service it uses?

Please rank the following responses 1-8, in the manner of importance

(1=most important, 8=least important)

Price of Services \_\_\_\_\_

Availability additional Services \_\_\_\_\_

Quality of Service \_\_\_\_\_

Customer Service \_\_\_\_\_

Payment Plan and Billing \_\_\_\_\_

Reliability of Service \_\_\_\_\_

Financial Strength of Company \_\_\_\_\_

Other \_\_\_\_\_

17. Have you ever thought about aggregating phone services? Yes \_\_\_\_\_ No \_\_\_\_\_

18. Did you know that on January 1, 1998 you will be able to choose who you purchase electricity from? Yes \_\_\_\_\_ No \_\_\_\_\_

19. Knowing that you can "shop around" by yourself or with others for electricity in 1998, what would it take for you to aggregate?

20. What would you hope to get out of it?

21. If you could create an extra saving of 10% on your electricity bill for your organization would you shop around with other non-profits? Yes \_\_\_\_\_ No \_\_\_\_\_

22. Knowing that you can shop around for electricity, how would you organize to receive the discount?

Seek more information about electricity aggregation \_\_\_\_\_

Talk to other non-profits about bulk buying \_\_\_\_\_

Contact a umbrella organization, for example the United Way about coordinating this effort \_\_\_\_\_

22. How would you rank ("1" being the highest and "3" being the lowest) the relative importance of each of the following factors in your decision of who you would purchase electricity from?

Companies \_\_\_\_\_

Reliability \_\_\_\_\_

Reputation and Experience of the Aggregator \_\_\_\_\_

23. Would you pay more for "green" electricity e.g. electricity generated by solar, wind or geothermal? Yes \_\_\_\_\_ No \_\_\_\_\_

24. Can I contact you again if I have any further questions? Yes \_\_\_\_\_ No \_\_\_\_\_

**THANK YOU!!!!**