

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 BACKGROUND**

In the world of competitive economies, electricity plays a significant role in the country's social and economic development. It is an important fuel for economic development and quality of life. The cost of electricity is likely to be one of the important elements assisting the country to achieve its economic goals. In general, people have a better quality of life through electricity, which increases domestic comforts, industrial competitiveness, job creation and revenues. As conventional electricity technologies of thermal power plants need to employ massive amount of fossil fuels, which are non-renewable and will be finished in the near future if substitution energies are not employed or electricity demand continues to increase, energy efficiency in use should be planned.

Unfortunately, due to the situation in the Middle East, the world is now facing an oil crisis. Alternative fuels, for instance, gasohol and natural gas, are now top of the government's agenda. Consequently, both alternative fuels such as non-fossil resources or renewable energy and energy saving are likely to be come more essential to achieve economic goals. However, according to the Office of the National Economic and Social Development Board (Electricity Generating Authority of Thailand, 2006, pp.13), the Thai economy is forecast to grow at a slower pace of 4.0-5.0 percent in 2007 as a result of the slowdown trend of the world economy which will lead to limited potential for Thailand's export growth, the Thai Baht currency appreciation, and the recovery of private investment which is not expected to be fully realized due to the uncertain political situation. It can be said that electricity generation in Thailand has not been in a stage of serious shortage yet. According to the new load forecast, electricity peak generation requirements for 2007-2008 are projected to grow by 7.14 percent and 6.40 percent whereas energy generation requirements will increase by 6.37 percent and 5.52 percent respectively. Therefore, an electricity energy saving program was initially implemented to attain sustainable development in electricity.

The demand for energy has continued across the world to support economic development and population increases. Asia has a much higher growth rate of energy consumption than other parts of the world due to its economic expansion and the rapid growth of urban communities. Like in other Asian countries, in Thailand over the next 15 years the demand for electricity is predicted to increase 5 - 6 percent per year which is close to economic growth (Electricity Generating Authority of Thailand, 2006, pp.6).

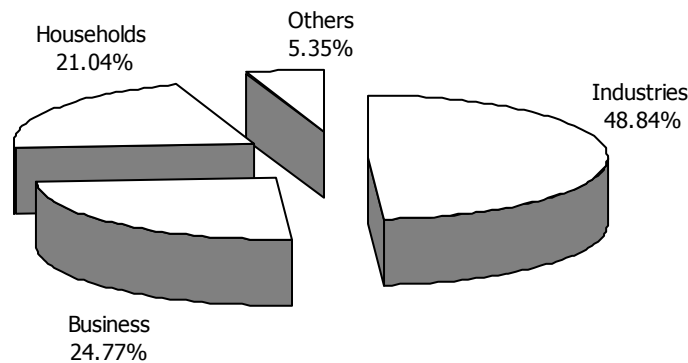
Since electricity is a vital factor driving economic and social development, the Electricity Generating Authority of Thailand (EGAT) produces electricity for the country and distributes electricity for Thai people through Provincial Electricity Authority (PEA) and the Metropolitan Electricity Authority (MEA).

The electricity peak generation requirement of the country rose to 21,064.00 MW on May 4, 2006 at 13.30 hours, higher than the preceding year by 526.50 MW or 2.56 percent. Energy generation requirement throughout the year 2006 grew in line with the economic growth rate, amounting to 141,947.58 million kWh of which 47.78 percent was produced by EGAT's power plants and 52.22 percent was the energy purchased from private power producers.

At the end of December 2006, the country's installed generating capacity totaled 27,107.21 MW, of which 58.27 percent was from EGAT's power plants. The remaining 41.73 percent was the generation capacity of private power producers comprising 31.76 percent from IPPs, 7.61 percent from SPPs, and 2.36 percent from neighboring countries.

Electricity consumption increased 5.52 percent from the prior year to 127,930.30 million kWh. The industrial sector is the biggest consumer, accounting for 48.84 percent of the country's total electricity consumption, followed by the business or commercial sector (24.77 percent), residential sector (21.04 percent), and other sectors (5.35 percent). Compared with the prior year, consumption in the industrial and business sectors grew at the slower rates of 4.77 percent and 6.76 percent respectively while residential and other sectors have consumption growth rates of 5.61 and 6.41 percent (Electricity Generating Authority of Thailand, 2006, pp. 10-11).

### 2006 Electricity Consumption by Sectors



The increase in electricity production to support unlimited demand not only results in environment impacts such as the release of carbon dioxide into the atmosphere but also adds to the cost of electricity because the country's limited energy resources are continuously used. The increased electricity production must depend on fuel from other countries which has unstable prices and the resulting increase in the electricity price decreases the competitive capability of Thai products in the world market. Therefore, the effective management in electricity use could slow down the growth in demand and decrease the cost of domestic products and services.

From this situation, the use of electricity in Thailand has a tendency to increase year by year because electricity is vital to the country's development in all aspects. To accommodate the fast growing electrical demand, the country has to use price sensitive imported fuel from neighboring countries and to invest in constructing new power plants. If Thai people use electricity efficiently, the electrical demand could decrease and the construction of new power plants might not be necessary. As the researcher is an employee of EGAT, the findings about knowledge of electrical energy saving of Thammasat University students will serve as a guideline for EGAT to run further campaigns for Thai students to participate in efficient use of energy.

## 1.2 STATEMENT OF THE PROBLEM

The study is conducted to answer the following questions:

### *Main question*

- What are the knowledge levels of electricity energy saving of Thammasat University students ?

### *Sub-questions*

1. Is there any relationship between students' personal factors and their knowledge levels of electricity energy saving ?

2. What are students' suggestions for further improvement of the electricity energy saving program ?

## 1.3 OBJECTIVES OF THE STUDY

The Objectives of this survey are as follows:

### *Main objective:*

- To evaluate the knowledge levels of electricity energy saving of Thammasat University students.

### *Sub-Objectives:*

1. To find out the knowledge of electricity energy saving of Thammasat University students regarding 1) the situation of electricity in Thailand 2) Demand Side Management program (DSM) 3) unit of electricity and electrical equipment 4) the way to choose, use, and maintain electrical equipment.

2. To identify the relationship between the students' personal factors and their knowledge levels of electricity energy saving.

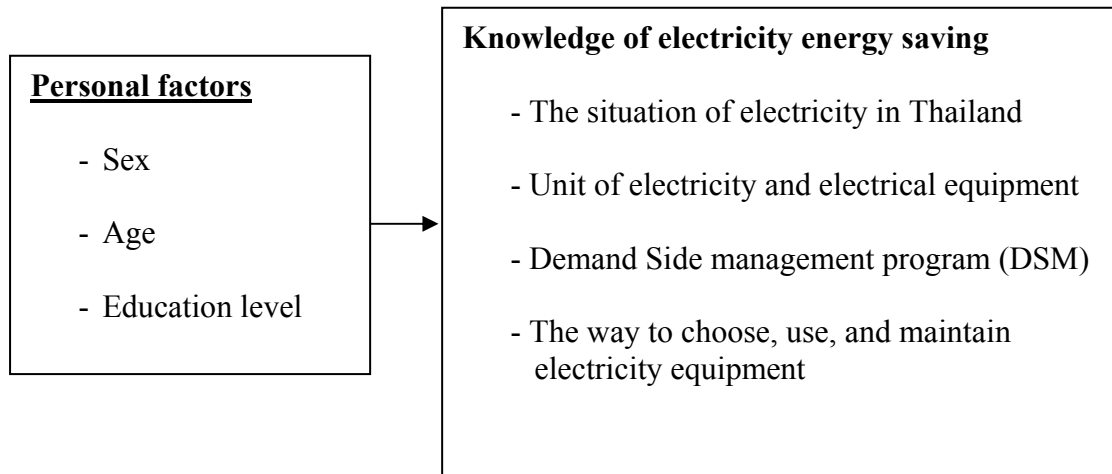
3. To seek the students' suggestions on how to improve the electricity energy saving program.

## 1.4 DEFINITIONS OF TERMS

### 1.4.1 Variables

#### Independent Variables

#### Dependent Variables



### 1.4.2 Definitions

In order to understand the terms used in this survey, the researcher provided the definitions of terms as follows:

#### **Knowledge of electricity energy saving**

The level of understanding of information on a subject which has been obtained by experience or study.

Consequently, the knowledge of electricity energy saving refers to the knowledge of the following aspects:

- Knowledge of electricity situation in Thailand
- Knowledge of Demand Side management program (DSM)
- Knowledge of units of electricity and electrical equipment
- Knowledge of the way to choose, use, and maintain electrical equipment

The knowledge of these mentioned aspects was measured by using Mean and Standard Deviation.

### **Demand Side Management (DSM)**

This government-initiated project was undertaken by the Electricity Generating Authority of Thailand (EGAT) to encourage efficient use of electricity in Thailand.

The knowledge of this aspect was measured by using Mean and Standard Deviation.

### **Students**

Male and female students who are studying at Thammasat University in 2007 at different levels including Bachelor's degree, Master's degree, Doctoral degree and Diploma. The number in each group was presented in Percentage and Frequency.

#### **1.4.3 Research Hypotheses**

The hypotheses in this survey are as follows:

Hypothesis 1: *There is a relationship between personal factors and knowledge of electricity energy saving.*

Hypothesis 1.1: Male and female students have different knowledge of electricity energy saving.

Hypothesis 1.2: Students of different ages have different levels of knowledge of electricity energy saving.

Hypothesis 1.3: Students with different education levels have different levels of knowledge of electricity energy saving.

### **1.5 SCOPE OF THE STUDY**

The study focused only on the knowledge of the students who are studying in Thammasat University in year 2007 including Bachelor's degree, Graduate Diploma, Master's degree, and Doctor's degree. The results of the study revealed the levels of knowledge of electricity energy saving, and the students' suggestions for further campaign improvement.

## **1.6 SIGNIFICANCE OF THE STUDY**

EGAT's energy conservation effort will expand further in 2007 under a participatory campaign "Love Our Father of the Nation, Use Energy Wisely". This year a long campaign will be implemented both in-house and outside EGAT to encourage EGAT employee and public participation in efficient use of energy and energy saving. The study's results on students' knowledge of electricity energy saving will provide helpful information for EGAT to improve current programs and create further beneficial programs. Other objectives of the study are also as follows:

- To present the knowledge levels of electricity energy saving of Thammasat University students.
- To create a better understanding of the relationship between personal factors and knowledge.
- To be a guideline for the development of electricity energy saving programs for EGAT.
- To be a guideline for other people who are going to conduct further research on energy saving in Thailand.

## **1.7 ORGANIZATION OF THE STUDY**

The survey of Thammasat University students' knowledge of electricity energy saving is divided into five chapters. Chapter one includes the background of electricity in Thailand and statement of the problem, which led to the objectives, the scope of the study, the definition of terms, and the significance of the study, respectively. Chapter two is designed to review the related literature concerning the knowledge of electricity energy saving. Chapter three provides a descriptive picture of procedures concerning subjects, materials, procedures, and data analysis. Chapter four presents the findings of the survey. Chapter five includes a summary of the survey, its findings, discussions, conclusions, and recommendations for further study. In the Appendix, the questionnaire, which was used for data collection from the sample group, is presented.