CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND

Thailand is the second largest energy consumer in South East Asia, while being a net oil importer. This imbalance of energy imports has been a great burden to the country's economy, as well as making it unreliable and unsteady. The country spends over 10 percent of GDP for energy imports and the transport sector accounts for 36 percent of total final energy consumption of which 50 percent is diesel. That reflects diesel's huge impact on the nation's economy. A solution to the above problem is to seek alternative energy sources. Biomass is one of the most promising, since it is renewable, locally available and cleaner than fossil fuels. Among biomass sources, biodiesel is an attractive renewable fuel, because it is environmentally friendly and can be synthesized from edible to non-edible oils.

His Majesty The King was a pioneer of alternative fuels in Thailand. Dating back to 1985, His Majesty had Prince of Songkla University establish a small palm - oil extraction plant at Ao Leuk Community Cooperative, Krabi Province, as well as instructing that a small palm-oil extraction plant with a capacity of 110 liters/day should be built at the Pikul Thong Royally Initiated Project Development Study Center, Narathiwat Province. In 2002, His Majesty's Personal Affairs Division conducted an experiment in which palm diesel was used for diesel vehicles at Klaikangwon Palace, Prachuap Khirikhan Province. Above all, His Majesty was awarded by Brussels Eureka 2001 for the 50th World Exhibition of Innovation, Research and New Technology in Belgium for his innovation of the use of palm oil to make biodiesel.

In response to His Majesty The King's initiative, the Royal Thai Navy started its biodiesel production and demonstration project in 2001, which was conducted by the Department of Naval Dockyards aiming to find an alternative to diesel fuel. In 2004, its prototype biodiesel pilot plant of 2,000 liters per day was built to serve the Royal Chitralada Project (RCP). Used cooking oil from the RCP canteen was used as a raw material for biodiesel.

The state policies on biodiesel production :

The Thai cabinet resolution of 28 January 2005, set a target to initiate commercial biodiesel distribution in the country in 2006. The biodiesel development strategy was to replace 10 percent of petro-diesel in the transport sector by 2012 as well as planning to increase the use of biodiesel from 365 million liters in 2007 to 3,100 million liters by 2012. Many biodiesel projects launched in Thailand to serve the government policies both at a small scale for community development and at an industrial scale, using local feedstock such as palm oil, used vegetable oils, lard, used lard, and jatropha oil. In addition, the Energy Policy Statement delivered by Prime Minister Abhisit Vejjajiva to the National Assembly on 29 December 2008, stated that *"4.4.2 Set alternative energy usage as national agenda by encouraging the production and usage of alternative energy, particularly biofuel and biomass such as gasohol (E10,E20 and E85)* ***biodiesel,*** *solid waste to enhance energy security, reduce pollution, and for the benefit of the farmers by encouraging the production and usage of renewable energy and* ***at community level*** *under appropriate incentive; encourage the usage of natural gas in the transportation sector by expanding natural gas distribution system nationwide; rigorously and continuously promote research and development of all forms of renewable energy."*

The state implementation of biodiesel production at the community level:

In line with the previous state policies, the Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, which is directly responsible for seeking alternative energy for the country, has been cooperating with seven organizations in the government sector in the research, development and demonstration of biodiesel. The DEDE project of "Community Biodiesel Research, Development and Demonstration" was launched in 2004 at San Sai District, Chiangmai Province, to provide prototypes for biodiesel production at the community level. The project was successful in establishing the system of community-level biodiesel production, demonstrations of biodiesel use in vehicles, studies on economic and environmental impacts as well as public relations of educational campaign for local people. Production trial started in April 2005 using feedstock of oil crops, used cooking oil and animal fats, while aiming to produce 2,000 liters of biodiesel per day through the transesterification process. At first stage, two percent of biodiesel was blended with 98 percent of regular diesel and the blending ratio was raised to five percent of biodiesel with 95 percent of conventional diesel four months later.

However, DEDE had to tackle the problem of public participation; only 15 taxi pickup truck drivers, out of the target of 100, used the newly-introduced fuel, due to lack of product reliability. Realizing the public perception problems, DEDE eventually filled the gap by giving consumers more product knowledge and understanding.

In addition, DEDE started two more pilot projects of community-level biodiesel in 2005, providing training of know-how for those interested in biodiesel production. Potential communities with at least 20 households and demand of at least 175 liters per day together with at least seven persons in charge of managing the project, could be provided with the establishment of biodiesel production system including equipments and trainings. The participating communities had to find raw materials and plant locations, to operate the plants and to manage the projects.

Currently, community-level biodiesel systems are being established nationwide, so that people in rural areas can generate more income, develop sustainable green alternative fuel, and reduce imbalance of oil imports . DEDE aims to establish the system in 70 communities with a capacity of 200 liters per day, while 46 were approved and 17 already set up. Most of the feedstock uses cooking oil and jatropha oil and the rest are palm oil and coconut oil. There were over 7,000 communities nationwide, each of which uses about 200 liters of diesel per day. If each community could produce its own biodiesel for its own consumption that would save the community money and would generate supplemental income from sale of the product and byproducts. Above all, its usage can greatly contribute to reduce global warming.

Mae Klong Samakki Karnkaset Group, Samut Songkram Province :

Mae Klong Samakki Karnkaset Group, Samut Songkram Province, is considered a model of the biodiesel-usage communities in Thailand, located at 115, Moo 9, Tawanjak Road, Laadyai, Muang District, Samut Songkram Province . For over two years, the community biodiesel (B100) project has been successfully driven by 800 group members living in the three districts of Amphur Muang (Mae Klong), Ampawa and Bang Khonthi, Samut Songkram Province, who have been suffering from poverty and a heavy debt burden of 1,738 million Baht in total for almost two decades. They found that community biodiesel (B100) with the capacity of 2,500-3,000 liters per day, produced from their used vegetable oil, lard and mainly palm oil, is the possible solution to their economic problems. Apart from other types of

feedstock, the oil palm plantation of the community group which covers about 3,000 Rai, will give a good yield of 4,000 liters per day for the years to come. The community members can use their locally-made green biodiesel as a substitute for regular diesel at a cheaper price of two Baht per liter. Additionally, their high-quality and fuel-economy biodiesel can be run in both high and low performance vehicles ranging from pickup trucks with commonrail, brand new cars to farm tractors and other agricultural machines. The byproducts (glycerol) from biodiesel production can also be sold to make soap, solid fuel and fertilizer.

1.2 STATEMENT OF THE PROBLEM

This study was conducted to find out the factors contributing to the users' satisfaction with community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province, as well as to seek users's suggestions for further improvement. This study aims to answer the following questions:

1.2.1 To what degree are the users satisfied with community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province?

1.2.2 How much do the users know and understand about community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province?

1.2.3 What are the users'problems in using community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province, as well as suggestions to solve the problems?

1.2.4 What are strengths and weaknesses in using community biodiesel (B100) at Mae Klong Samakki Karnkaset group, Samut Songkram Province?

1.3 OBJECTIVES OF THE STUDY

The objectives of this study are the following:

1.3.1 Main Objective

To identify factors contributing to the users' satisfaction with community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province.

1.3.2 Sub-Objectives

1. To examine the degrees of the users'satisfaction with community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province

2. To measure the users' levels of knowledge and understanding about community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province

3. To identify existing problems, if any, in order to recommend to the core team of possible ways to improve the efficiency of managing community biodiesels (B100) production at Mae Klong Samakki Karnkaset Group, Samut Songkram Province

4. To point out the strengths and weaknesses in using community biodiesel (B100) at Mae Klong Smakki Karnkaset Group, Samut Songkram Province

1.4 DEFINITIONS OF TERMS / VARIABLES AND DEFINITIONS

The definitions of the terms of this study are as follows:

1.4.1 Community biodiesel (B100): 100 percent biodiesel produced and used by Members of Mae Klong Samakki Karnkaset Group,Samut Songkram Province, with its feedstock derived from used vegetable oil, lard, used lard, and mainly palm oil, which are available in the neighboring areas of Mae Klong Samakki Karnkaset Group.

1.4.2 B100 Users: the Mae Klong Samakki Karnkaset Group Members, who are farmers, orchardmen, fishermen, and others using community biodiesel (B100) produced by the community itself

1.4.3 Occupation: four groups of occupations which are farmers, orchardmen, fishermen and others

1.4.4 Educational level: educational level of the B100 users, which are primary school, secondary school, bachelor degree ,and others

1.4.5 Household income/month: the average amount of income earned per month for each household belonging to the Mae Klong Samakki Karnkaset Group

1.4.6 Type of vehicle used: type of vehicles, such as cars, pickup trucks, trucks , tractors, boats, and others that use B100

1.4.7 Background knowledge and understanding about community biodiesel (B100): The knowledge and understanding that the B100 users gained before using B100, in terms of product quality, how to use products, and so on

1.4.8 Opportunity to generate higher household income: an opportunity for B100 users to earn more income or to save more money in producing or using B100

1.4.9 Managing efficiency of the core team of Mae Klong Samakki Karnkaset Group, Samut Songkram Province : The efficiency of the core team in managing the project business

1.4.10 Product: a good, service, place, idea, person-whatever is offered to customers for sale in the exchange including good design or packaging, and its features and related services such as free delivery

1.4.11 Price: the assignment of value or the price that the consumer must pay in exchange for the offered products. To determine the price of something based on what a product actually cost to develop plus a profit is not that simple

1.4.12 Place: the product availability to the customer at the desired time and location and also known as the *channels of distribution*, which are the companies that work together to get a product from a producer to a customer

1.4.13 Promotion: the activities that the marketers conduct to inform consumers or organizations about their products, and to encourage potential consumers to buy the products. These strategies can take many forms, including personal selling, TV/radio advertising, store coupons, billboards, magazine ads, and publicity releases

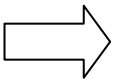
1.4.14 Users'satisfaction with B100: the degree of users'satisfaction with B100 i.e. opportunity, managing efficiency, and Marketing Mix (4Ps)

1.5 SCOPE OF THE STUDY

This research mainly focuses on factors contributing to the users'satisfaction with community biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province. The sampling unit of the study is 245 household heads from the approximately 400 households using B100 in the districts of Amphur Muang (Mae Klong), Ampawa and Bang Khonthi, Samut Songkram Province. The sampling unit was taken from each household member of the group. The study excludes factors contributing to the users' satisfaction with no other different blends of biodiesel such as B5, B10, B20 and B 85. The period of collecting data from the sampling unit was from December 2008 to the end of January 2009.

1.5.1 The factors included in this study are analyzed from the following variables.

Independent Variables
1. Demographic Data
Gender
Age
Occupation
Educational level
Household income/month
Type of vehicles used
2. Background knowledge and understanding about community biodiesel(B100)



Dependent Variables
3. The degree of users' satisfaction with community biodiesel (B100), which was divided into 3 aspects :

3.1 Opportunity to generate higher household income
3.2 Managing efficiency of the core team at Mae Klong Samakki Karnkaset Group, Samut Songkram Province
3.3 Marketing Mix (4 Ps) :
- Product
- Price
- Place
- Promotion

1.6 SIGNIFICANCE OF THE STUDY

The research findings will serve as a guideline to recommend to the core team of possible ways to improve the efficiency of managing community biodiesel (B100) production at Mae Klong Samakki Karnkaset Group, Samut Songkram Province in order to meet the users' requirements and expectations from using community biodiesel (B100).

1.7 ORGANIZATION OF THE STUDY

The study of Factors Contributing to the Users'Satisfaction with Community Biodiesel (B100) at Mae Klong Samakki Karnkaset Group, Samut Songkram Province in this paper is divided into five chapters.

1.7.1 Chapter One introduces the background of the study, the statement of the problem, objectives, scope of the study, definition of terms, and significance of the study.

1.7.2 Chapter Two defines the main supporting theories and reviews previous literature and research.

1.7.3 Chapter Three describes the research methodology aspects, subjects, and material used in the study as well as the procedures of data collection and data analysis.

1.7.4 Chapter Four covers the study findings.

1.7.5 Chapter Five includes a study summary, discussions, conclusions and recommendations for further study.