



## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

The three world energy crises in 1973, 1976 and 1990 have created awareness for the need for energy saving in all sectors. Effort have also been directed to the utilization of alternative sources of energy. The world oil situation, however, has changed since the last oil crisis and oil prices are now at 28-31 US\$ (1990, during Iraq-Kuwait crisis) per barrel, this has brought back various efforts in the research and development on alternative sources of energy.

As Thailand is an agricultural country, having rice cultivation areas of 60.1 million rice rais and 39,740 rice mills (1980) a large amount of rice husk is produced every year. It used as a fuel in conventional boilers to produce steam utilized in local rice mills.

Fluidized bed combustion technology offers a number of advantage for application as a low grade and fuels and has been successfully applied on commercial scales. The advantages offered by FBC technology include uniform bed temperature, better heat transfer, lower combustion temperature and lower emission from combustion. Thailand's non-conventional energy resources include 1,300 million tons of lignite, 18,000 million tons of oil shale and 3.5 million tons of rice husk produce per annum and an unestimated quantity of other available biomass material.

A number of present power plants are using lignite as fuel for electricity generation. The possibility of using FBC technology in these new power plant is high and also is the applications of this technogy to other types of fuels. Such requiments and interest by the researchers concened has led to this study on FBC technology.

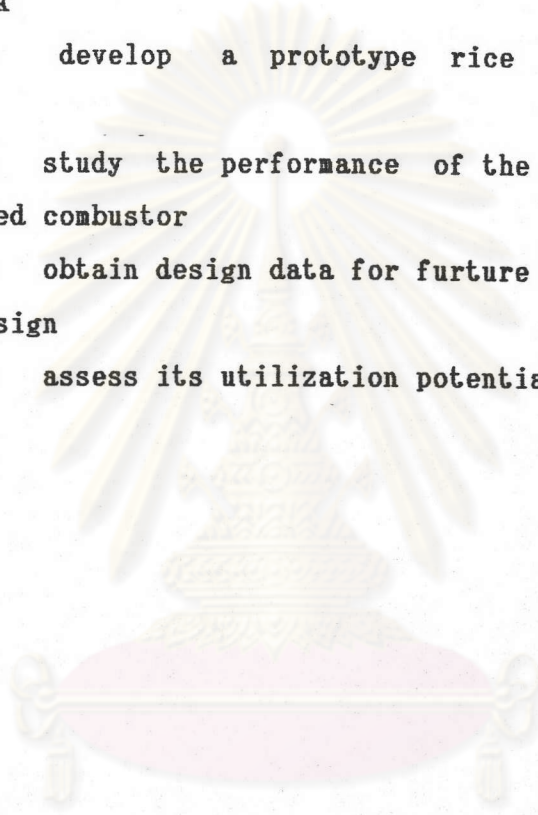


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## 1.2 Objectives

The objectives of this study are

- develop a technology for fluidized bed combustion of rice husk
- develop a prototype rice husk fluidized bed combustor
- study the performance of the prototype rice husk fluidized bed combustor
- obtain design data for future development work and scale up design
- assess its utilization potential



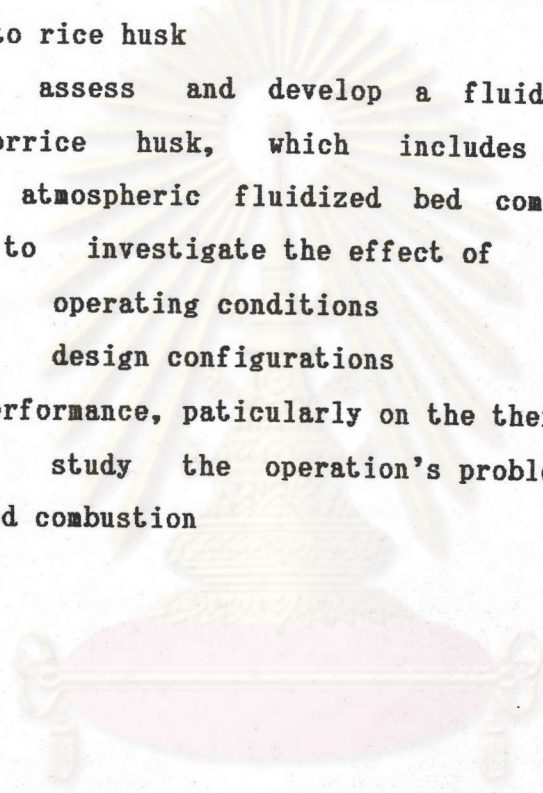
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1.3 Scope

With the above main objective, the scope of this thesis study is as follows;

- review fluidized bed combustion technology as applicable to rice husk
- assess and develop a fluidized bed combustion technology for rice husk, which includes the design of a pilot-scale atmospheric fluidized bed combustor and perform experiments to investigate the effect of
  - operating conditions
  - design configurations
 on system performance, particularly on the thermal efficiency
- study the operation's problem of pilot-scale fluidized bed combustion

  
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