CHAPTER 1
INTRODUCTION

POTENTIAL REDUCTION OF CO EMISSION INWASTE POWER PLANTS

1.1 Background

Electric energy is an energy that is much needed for society in this modern era, the demand for electrical energy in a city will show significant economic growthSirte is a city in Libya. This city is located in the north. Precisely in the District of Sirte. In 2010, the city had a population of 75,358 persons. The city empties into the Gulf of Sidra and has a height of 28 m[1], [2].Growth in energy demand Electricity in a city will show significant economic growth. Likewise in the Libyan city of Sirte, economic growth per year is around 6% and with a population growth rate of around 2% per year, the city is struggling to get ahead.

The mistake that occurs is the number of population in Libya every year is around 2.2%, causing waste production to increase every year[3], while the need for electrical energy is around 5% per year following the per capita income of the population[4]. This Caused The Garbage That Piled Up Just Left. Of these problems, waste management is not properly organized, environmental sanitation around the trash becomes very bad, communal health is a major problem in local governments and developing countries.

The solution to this problem is to use the planned waste from a garbage power plant to meet the demand for electrical energy in a city. With the process of all municipal waste (MSW) burned using an incenerator. An incenerator that has a combustion temperature of msw 850°c[5]. by applying a thermodynamic model and generating 40 MW of electricity in a waste power plant. so that the incinerator has the advantage in a short time to convert waste into electricity. in this study, groups of materials based on the type of waste, namely using metal, plastic, and paper waste for processing through thermal combustion using an incinerator, from the results of combustion of waste will produce co2 which is very dangerous for the survival of the earth, for that we need a system to mitigate co2 emissions from waste power plants using lca analysis.

Increasing with the development of computer technology, artificial intelligence is added to a computer system that can adapt on a computer machine so that it can work like the human brain. with one is fuzzy logic. Fuzzy logic in research is used to control CO2 from the results of waste combustion based on the above background, a feasibility study analysis is needed to analyze the potential for reducing carbon emissions (co2) in pltu waste plants with fuzzy mamdani logic and life cycle analysis.

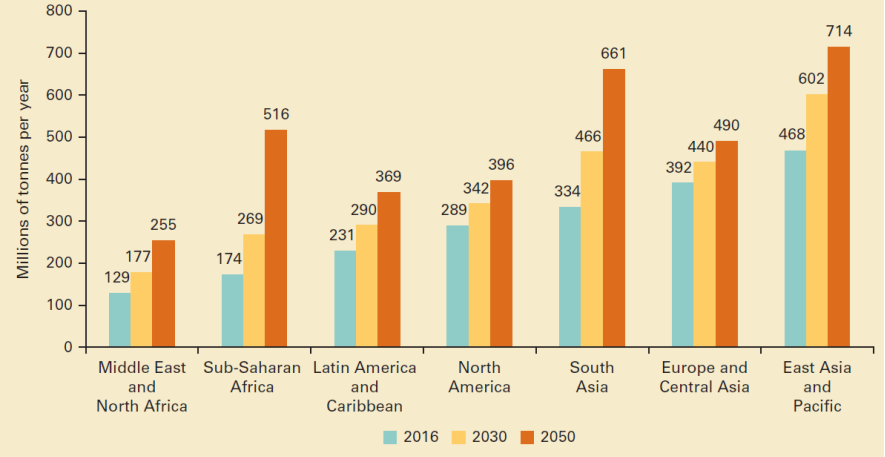

Figure 2.1. Projections of landfill by region (millions of tons / year) [6]

While the projected largest pile of garbage in 2050 is estimated to be produced by East Asian countries, including China and India, which have the largest population in theworld.If the projected pile of garbage is not managed properly, it will have an impact on global warming and the health of the world's population. According to the World Bank, this garbage heap is the impact of rising levels of income and the welfare of people around the world. As noted in Figure 2, the World Bank states that an increase in revenue contributes to the world's garbage production which accounts for 96%[6].

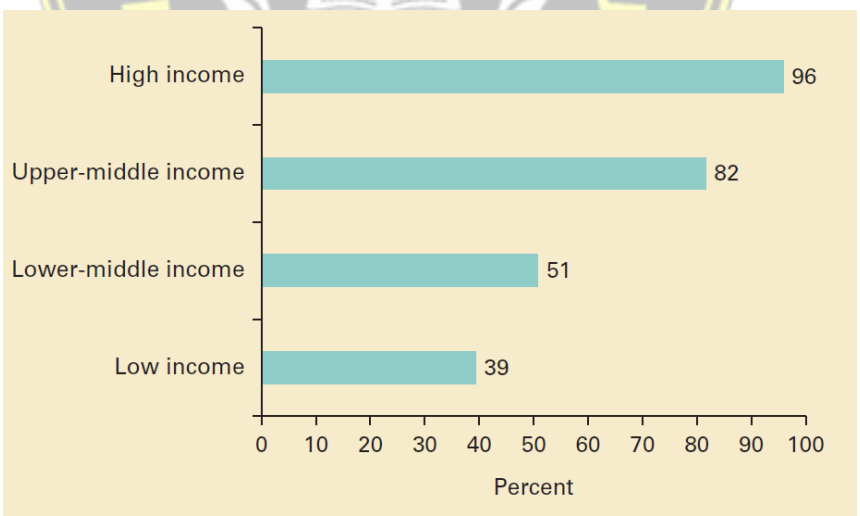

Figure 1. 2. The level of waste collection, based on the level of income (percent) [7]

In Figure 2, the World Bank states that waste management is a very important step in waste management based on income levels. Poor countries only contribute 48% of the solid waste in their cities, but outside urban areas it has fallen to 26%. The African and sub-Saharan regions only collect 44% of the waste while Europe, North America and Central Asia produce 90% of the waste[7].

The level of waste composition from countries varies greatly, the World Bank stated in its research that the largest composition of waste from developed countries is 32 percent of the total waste where dry and recyclable garbage dominates such as; plastic, cardboard, paper, and metal which account for around 51% of the total waste. Whereas organic waste and food from developed countries are only a few. Then 53% of waste is produced by middle-income countries with 57% of it can be organic waste and food. Then poor countries produce 50% of waste with 20% of which can be recycled[7].

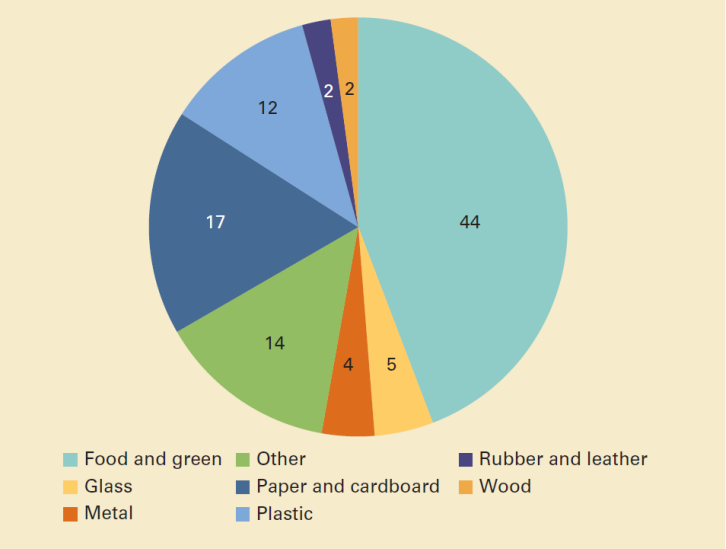

Figure 1. 3. Composition of World Waste by type of waste[7]

While [8] have conducted research on waste arising from the conflict in Libya which is estimated at up to 82 million tons, so that it has a profound impact on the Libya people. To solve this problem, recycling and integrated waste management are carried out to manage waste caused by conflict are proposes. Moreover, Life Cycle Analysis (LCA) has been used to compare possible alternative scenarios and evaluations in which different environmental parameters are reported in waste management[9], [10]. The aim of this work is to compare the environmental impacts of four different scenarios that have been analyzed for the technological and economic aspects of the previous work.

Often there is a misunderstanding that states that technology is an effective solution to overcome unmanaged waste. As evidence, developed countries manage their waste and waste well so that it can minimize the impact of using waste management technology. They do not openly dispose of waste but rather manage it perfectly in some form of processed waste. Separation of types of waste contributes to the economic potential for local governments to manage organized waste. In general, 37% of waste is disposed of in landfills, 8% of which

are disposed of in organic form and put into sanitary machines that produce gas. While disposal to open areas around the world includes about 31% of waste with 19% recycled through composting and 11% burned at final disposal[7].

1.2 Problem Formulation

a. How to analysis material that are suitable for waste power plant incenerator
b. How to reduce CO emision by applying sorting and selection materials of the incenerator using LCA analysis

1.3 Purpose of the study

a. To analyze the materials that are suitable for incenerator reactor in waste power plant using fuzzy logic.
b. To mitigate CO emision of waste power plant using LCA analysis and fuzzy logic.

1.4 Writing system

a. Chapter I: Introduction:

   Background Issues, Formulation Of The Problem, Research Objectives & Benefits, Authenticity Of Research, And Writing System

b. Chapter II: Litereature Review & Basic Theory:

   The development of research results that have been carried out by other researchers (from journal reports, procedings, papers, seminars or other reference). Write down the strengths and weaknesses of each. Basic theory used.

c. Chapter III : Metodology

   Research Model, Tools and materials used, Research procedure, Methodology, Software/ Hardware used, and Research Flow Stages

d. Chapter IV: Result And Discussion

   This chapter will describe the result and discussion.

e. Chapter V: Conclusion And Recommendation

   This last chapter including the conclusion and recommendation.