

CHAPTER I

INTRODUCTION

1.1. Background

Bandung Regency is a Regency which has an area of 1.768 Km² where Bandung City is also the Capital of West Java Province, Indonesia. Based on data from the Bandung Regency Central Statistics Agency, the population in Bandung Regency in 2019 reached 3.775.724 people, of which 1.911.189 people were male and 1.864.090 women. The potential for waste generated will certainly be very abundant, therefore that we need good waste management. Waste management is one of the crucial things to make a better environment. Good waste management is needed for overloaded waste in Bandung Regency with the concept of waste to energy to process waste into electrical energy. The electricity can be used in the Bandung area, in cities closer to Bandung or for company operations itself which is can help provide electricity needs in Indonesia [1].

Currently, Bandung is one of the economic centres in West Java with a total income of 103 million rupiah per capita. Of all the problems in Bandung, the only concern is waste management. Waste management in Bandung is currently very bad where the waste is almost piled up in every TPS location. Trash cans in the form of automatic trucks placed at TPS points are not able to accommodate the waste. The trash can is full, while the amount of waste outside the tub is 7 times the amount of garbage in the trash. To reduce this problem, it can be burned and the heat can be used to generate turbines in incinerators [1].

Therefore, resources are easy to obtain because waste is something that people throw away every day, making waste an ideal item to be processed into renewable energy [3]. with the heat generated from burning waste, which will spin a turbine that will produce electrical energy. The concept is very simple and reversible, where when the turbine is given electrical energy it will produce

rotational energy. otherwise, rotational energy will produce electrical energy. In addition, gas emissions will be tested and data were taken for gas emission testing [2].

1.2. Problem Identification

From some of the descriptions presented in the background, the following problems can be identified:

1. Waste management in Bandung Regency is overloaded, which is the potential can be utilized for waste power plant.
2. The feasibility of using waste to fuel power plants in Bandung Regency has not been tested for feasibility, where the utilization has the potential to be of economic value.

1.3. Scope and Delimitations

Limitations of the problems of this study are:

1. The research location of the feasibility of building a waste power plant is carried out at the Sarimukti Final Disposal Site in Bandung Regency.
2. Technical specifications adapted from the schematic of the Bantargebang Waste Power Plant, Bekasi.
3. Generator technology uses a turbine generator as a power generator.
4. Technical feasibility parameters are measured from the potential power generated from burning waste.
5. Economic feasibility parameters are measured from Net Present Value, Internal Rate of Return, Payback Period, and Levelized Cost of Electricity.

1.4. Problem Formulation

From some of the descriptions that the author put forward in the background section, the author can formulate the problem as follows:

1. How is the feasibility of building a waste power plant for the waste of Sarimukti landfill, West Bandung Regency.

2. How is the economic potential of the construction of a waste power plant in West Bandung Regency.

1.5. Objective

Based on the formulation of the problem, it can be seen that the research objectives are as follows:

1. To find out the feasibility of building a waste power plant at the Sarimukti landfill, West Bandung Regency.
2. To find out the economic potential of the construction of a waste power plant in West Bandung Regency.
3. To Accelerate the Construction of Waste Processing Installations into Electrical Energy Based on Environmentally Friendly Technology according to Presidential Decree No. 35/2018.

1.6. Hypothesis

This research will examine the feasibility of constructing a waste power plant at Sarimukti landfill, West Bandung Regency for the utilization and processing of waste so that it can be optimized as fuel for a waste power plant to drive a turbine as a generator from the power plant. The technical specifications of the power plant are adapted from the Bantargebang Bekasi waste power plant. The parameters of the feasibility study for the construction of the waste power plant are assessed from the power potential and economic potential of the waste power plant. The calculation of these parameters is generated from the calculation of data obtained from the location of the Sarimukti landfill, West Bandung Regency.

1.7. Research Methods

This thesis will use fundamental studies and experiments. The methodology in this study is as follows:

1. Study of Literature

Research, collect literature and studies related to the problems in this thesis in the form of reference books, articles, or journals related to the feasibility study of the construction of a waste power plant.

2. Method Selection

The selection of the proposed method is a parameter of the feasibility of building a waste power plant to be built from waste in the Sarimukti landfill, West Bandung Regency. In this study, the parameters used are power estimation, and economic potential using the NPV, IRR, BCR, Payback Period and Levelized Cost Of Energy methods..

3. Calculation Process

Calculations will be made by calculating from obtained data. The calculation includes power potential and economic potential with the chosen method.

4. Analysis of Calculation Results

The calculation results will be analyzed by taking parameters related to the feasibility of the construction of a waste power plant to be built.