CHAPTER 1

INTRODUCTION

1.1 PROJECT SYNOPSIS

1.1.1 General Project Synopsis

The concept will be little bit different with the others current designs or concept of biogas digesters. In producing the new design of mini biogas digester, there are including with the process of generating concept, design the concept and fabrication.

The mini biogas digester is just equipped with all the required materials that are square, welding, riveting and fastening method to joint all the part. This mini biogas digester also equipped with rollers to make it more portability and make it to be friendlier to the user. The rollers are sheet, and hollow steel, rubber sheet and plywood with the manufacturing skills process such as join at the base of the digester and be likely as a trolley that seen more flexible to move. The body of this mini biogas digester is designed to decrease it weight as light as possible to increase its portability characteristic and its volume of the body also designed to get the bigger size as possible but still suit with it characteristic of portability and the mini size.

The digester is designed mostly like the large size digester that commonly use to run the fermentation of materials that can produce methane gas and contain of higher content of ammonia for example cow manure, but it will be develop to be in mini size. Even though it is in mini size, the process stills same as the larger size digester which is
to produce methane gas to be used to replace cooking gas as the example, and all the function still can operate like usual but the volume is limited. The process of developing this digester is still considering the suitable to the user and its ergonomic factor.

1.1.2 Specific Project Synopsis

The project involves the developing and analysis of the body shape of the digester to make it more efficient to produce methane gas and also will concern about the structure strength, durability, ergonomic factor, and convenience. The new concept of this digester is also being more focused on the strength of its body. All the specifications must be verified to avoid materials and fund wasting. Overall process to design, develop, and fabricate this digester required the skills of designing and fabrication and used all the basics knowledge of Static, Industrial Design, and Manufacturing Technology.

1.2 PROBLEM STATEMENT

Usually all the biogas digesters are used to produce methane gas and the size of the digesters are commonly bigger in size. Some users who live in poor conditions who know the uses and advantages of using methane gas wanted to have a biogas digester at home and wanted to use the methane gas for replacing the cooking gas and to generate electricity, because they cannot afford to buy cooking gas and pay the monthly electric fee.

So, because of that they wanted to have a biogas digester, but according to their affordability, they still cannot have the biogas digester which is usually bigger in size. The only solution for them to solve this problem is to produce a mini biogas digester that has same function with the bigger digester.
1.3 PROJECT’S OBJECTIVE

The objective for this project is:

i) To design a portable mini biogas digester.
ii) To fabricate a portable mini biogas digester.

1.4 PROJECT’S SCOPE

Usually, the biogas digesters are bigger in size that commonly use for the fermentation of waste products to produce methane gas for generating electricity as the example. By this project, the biogas digester is design and be fabricated to be in smaller scale with the dimension of 59cm x 59cm x 90cm. The materials use is mild steel because of it better characteristics. The design is visualize by using SolidWorks software.

1.5 THE PROJECT PLANNING

By following to the planning Gantt chart shown by Table 1.1, the project started with getting the problem statement, scope and the objective for the project. This process include with the getting the project title, first meeting with the supervisor, getting the information that regarding to this project through internet and the other sources for literature review. This planning is from week 1 until week 4.

Then, the designing stage start at studying the Morphological chart, verify the product design specifications, generate new concept, use method of screening process and select the final concept. At this stage, the new concepts is sketched and designed by using the Morphological chart, which is by pairing one concept to the other one concept. The concept screening is run on all the concepts that generated and the best concept is selected as the final concept that will continue with designing the concept by using SolidWork software and the fabrication process. This planning is running in week 3 to week 6.