CHAPTER I INTRODUCTION

I.1 Background

PT. X is a subsidiary of PT. Pertamina in the upstream sector. As an oil and gas company, PT. X has a function to support the national energy supply. In order to fulfill that function, PT. X need to have the reservoir reserves as many as possible in their working area. Those reservoir later will be developed to become the source of gas and oil well and distributed to customers or some certain area that need it. In this case, the reservoir that will be developed is XX field in north sea java. The development of some field is usually triggered by the demand by some companies.

The price index of natural petroleum and gas based on several standardization. Despite of those many, there are two of the standard that commonly used, which are Brent Crude and West Tax Intermediate Crude Oil. UK Brent Oil is sourced from the North Ocean and it is utilized to value 66% of the worlds globally exchanged crude oil supplies. The product has dates consistently and it is valued in dollars, with every agreement likening to 1,000 barrels and brokers working on the Intercontinental Trade (ICE). On the other side, WTI is refined for the most part in the Midwest and Bay Drift locales in the U.S., since it is fantastic fuel and is created inside the nation that standardized by International Trade called Nymex.

Both of those standard has slightly differences in between and growth at different rate. The narrowing of the spread is upheld by a few variables that have Brought down Brent (North Ocean) costs since Brent-quality rough imports into North America have been dislodged by expanded U.S. light sweet unrefined generation, lessening Brent-quality rough request and Raised WTI (Cushing, Oklahoma) costs in light of the fact that the framework restrictions that had brought down WTI costs are decreasing.

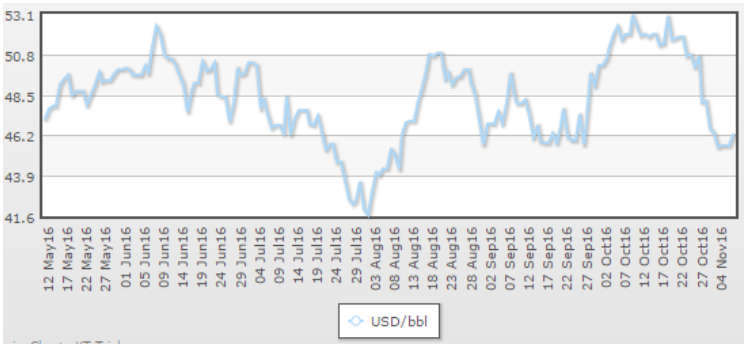

FIGURE I.1 Brent Crude Oil Price for the last 6 Months ("Harga Minyak Dunia Hari Ini".http://hargaminyak.net Retrieved 07 November 2016.)

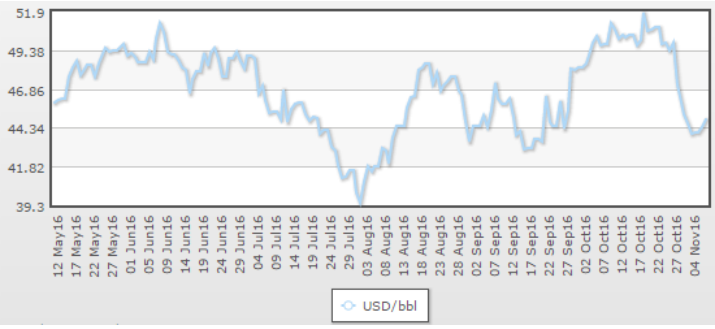

FIGURE I.2 WTI Crude Oil Price for the last 6 Months ("Harga Minyak Dunia Hari Ini".http://hargaminyak.net/ Retrieved 07 November 2016.)

Based on Figure I.1 and I.2 it can be seen the difference between the price of oil is based on standard WTI and Brent. Despite the differences between the two standards, graphically it can be seen that the decrease and fluctuation in the growth of crude oil prices. In this unstable condition the oil and gas industry globally and locally require a more efficient cost than the normal condition for the company so they can survive on the threshold of a crisis. Techno-economy analysis is one of the most suitable method to solve this problem.

Investment in oil and gas projects is a complex sequential order. At each stage, the company gather information to decide whether the project is feasible forwarded to the next stage with the risk of financial loss if one phase fails to achieve its objectives (Couët, 2003). To take a decision on a project that is most financially feasible when compared to some project options available, it is necessary techno-economy analysis.

PT. X as one of the biggest oil and gas company in Indonesia realize these condition as threat. In order to survive in that condition, they started to do efficiency program for all of their projects. Their projects are vary started from drillling, exploring, etc. One of their latest project is building the facility to do lifting process. Lifting, is a process to lift the gas and the oil from the upper crust of the earth to the surface of the sea. There are several techniques that used for execute the lifting process started from the manual and artificial lift. Nowadays most of the oil and gas company use the artificial lift as their method of the lifting process and so do PT. X.

Artificial lift is a process that use pressure or other method to get the oil and gas. There are many of the artificial lift method, one of the most used is gas lift. Gas lift is a method of artificial lift that uses an external source of high-pressure gas for supplementing formation gas to lift the resevoir fluids. The principle of gas lift is that gas injected into the tubing reduces the density of the fluids in the tubing, and the bubbles have a "scrubbing" action on the liquids. Both factors act to lower the flowing bottom hole pressure (BHP) at the bottom of the tubing. The whole process in general described on FIGURE I.3.

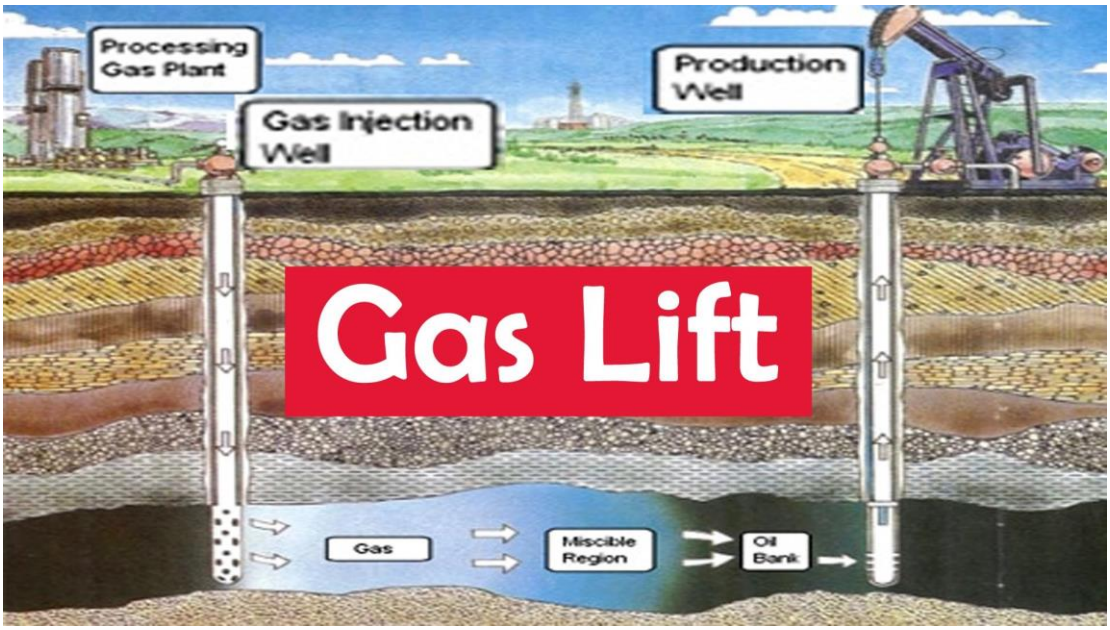

FIGURE I.3 Oil Production by Gas Lift (Oil & Gas Videos, 2014).

In a context of build a project, PT.X usually make several alternatives that will be decided later. These alternatives will be generated through several meeting with all divisions that related to the project. Decision making is basically a procedure of selecting the best alternative given the accessible data for correlation of qualities and shortcomings of every alternatives. The decisions are made by recognizing the option with the most income or the minimum cost. In order to decide that, the techno-economy analysis will be used to solve that.

In this case, XX field have three alternatives development. First is building the new ORF (Onshore Receiving Facility) near the existing office branch in Cirebon. The second is do the manual lifting by rent a ship to deliver it to the customer or in the simplest it could be called shipping and docking. And the last alternative is making an agreement to use the

facility that owned by PT. PEP and this process is called joint lifting. Those three alternatives has one place to deliver which is the main station in Cilamaya before it could be delivered to the customers.

Techno-economy assessment in principle is a cost-benefit comparison between alternatives using different methods. These assessments are used for tasks such as evaluating the economic feasibility of a specific project, investigate cash flows over the lifetime, Evaluate the likelihood of different technology scales and applications, and Compare the economic quality of different technology applications providing the same service. In this research Techno-economic assesment and analysis will be used to determine which alternative that the most feasible one in between several project alternatives to build the lifting facilities in northern java island field who will be build by PT.X.

I.2 Problem Formulation

There are several problem formulation that is needed:

1. How is the comparison between alternatives from technical aspect?
2. How is the cost and benefit for every alternatives?
3. What is the best alternative for lifting the gas from XX field?

I.3 Objectives

Based on the formulation of the problems mentioned above, purposes of this research are:

1. Designing technical aspects with comparing the advantages and disadvantages on each alternative.
2. Determining costs and benefit of each alternative.
3. Determining the best alternative based on the result of techno economy analysis.

I.4 Research Benefit

The expected benefits of this research are:

1. PT X can determine the factors related in determining the most efficient project options on XX field condensate lifting facility project.
2. PT.X can determine the most efficient option to build projects.

I.5 Problem Limitation

Limitation of problems in the implementation of this thesis is as follows:

1. The research is conducted in the division Commercial & Finance in PT. X. For data that could not obtained in the company's will be use the data from national standard.

I.6 Writing System

Here is a systematic used in the study

CHAPTER I Introduction

This chapter contains the background of the research, formulation of research problems, research objectives, limitation of the study, the benefits of research and writing systematics.

CHAPTER II Theoretical basis

This chapter contains literature that related to problems studied and discussed in previous research.

CHAPTER III Research Methodology

This chapter contains the steps in conduct research stage start from formulating problem, formulating research objectives and benefit, developing research models, processing research data, and designing data processing analysis use techno economy analysis method.

CHAPTER IV Data Collecting and Processing

This chapter contains all of data that needed and calculation process in techno-economy assesment.

CHAPTER V Analysis

This chapter contains the analysis of techno-economy assesment.

CHAPTER VI Conclusion and Suggestion

This chapter contains the conclusion of this research and the suggestion for further research.