

CHAPTER I

INTRODUCTION

As environmental awareness increases, industries and businesses have started to become aware and try to assess how their activities affect the environment. Society has also increasingly concerned about the issues of natural resource depletion and environmental degradation. Thus, many businesses have responded to this awareness by providing “greener” products and using “greener” or “cleaner” processes. The environmental performance of products and processes has become a key issue, which is why some companies are investigating ways to minimize their effects on the environment. Many companies have found the advantageous to explore ways of moving beyond compliance using pollution prevention strategies and environmental management systems to improve their environmental performance.

There are many techniques to analyze the effect on the environment. How do we know what techniques will give the most relevant results? For example, comparison between hydrogen-fuel vehicle and gasoline-fuel vehicle, most people tend to believe that hydrogen-fuel vehicles have less emission because they focus on the use stage. But, in fact, most commercial hydrogen has currently been produced from oil. Consequently, there might be more emissions as compared with conventional gasoline. So if we are to compare emissions between hydrogen-fuel vehicle and gasoline vehicle we need to take into account all processes, from resource extraction to the vehicle final disposal. One of the techniques is Life Cycle Assessment technique (LCA). This technique will calculate environmental effect, raw materials and energy consumption throughout product's life (Cradle to Grave). The main development of this method has taken place in the 1990s and it has been standardized in ISO standards no. 14040 to 14043. At present, LCA is widely used by many industries to develop the environmental performance of product.

In Thailand, natural gas industry is very important because of two major reasons. First, natural gas is a major energy source in Thailand since it is used to generate 60% of electricity in Thailand. Second, natural gas is used as feedstock for petrochemical industry that has an annual value of over 200,000 million baths. Therefore this research focuses on identifying and quantifying the environmental

impact of natural gas production by using life cycle assessment approach. The scope of the study includes raw materials, production processes, utilities, energy and materials used in three gas separation plants (GSPs) of PTT PLC. For the analytical, SimaPro 7.0 software is used to assess the environmental impact based on the life cycle inventory of natural gas production PTT complex, Map-ta-put, Rayong. In this research, impacts on global warming, stratospheric ozone depletion, and acidification are quantified.