

ABSTRACT

Urea fertilizer product 1A is one of the products made by PT Pupuk Kujang specifically at factory 1A. The main raw materials used in the production process of Urea 1A fertilizer are carbon dioxide and ammonia. The process of making Urea 1A fertilizer requires a very large use of energy and chemical raw materials so that it has the potential to cause a large environmental impact as well. Therefore Life Cycle Assessment is used with the aim of analyzing what environmental impacts resulting from the production process of Urea 1A fertilizer. In addition, the Life Cycle Cost method is used to be a parameter whether the environmental impact produced exceeds the reasonable limit or not by looking at the comparison of internal and external costs. Based on data processing the Life Cycle Assessment method using Simapro 7 software, Marine aquatic ecotoxicity, Acidification, and Global warming with values of 497304.45 kg 1.4-DB eq, 40.99840 kg Sb eq, and 2294.19776 kg CO₂ eq. The component that produces the most environmental impacts is the use of energy steam and natural gas. The results of the Life Cycle Cost method show that the total external cost is Rp5,544,467.73 (57%) greater than the total internal cost of Rp4,106,217.95 (43%). Therefore it is evident that the environmental impact resulting from the production process of Urea 1A fertilizer products is more than the reasonable limit if selected from the cost parameters produced. The results of the sensitivity analysis prove that the reduction of emissions and energy is the best alternative to reduce the environmental impact resulting from the production process of Urea 1A fertilizer.

Keywords : life cycle assesment, life cycle cost, sensitivity analysis, internal cost, external cost.