

ABSTRACT

As industry has grown and taken an increasingly large role on the global competition, put most of the manufacturers are facing the urge to seek more in adapting new strategies in order to gain more supports for sustainability measures. These penetrate the manufacturer to respond to the market and customer's demand for sustainable products. In this present study is aimed to assess and evaluate the environmental impact of PET bottle simultaneously to improve the productivity in concerning to ecological and economical aspects. Two methods were used to conduct the whole study; life cycle assessment (LCA) and Eco-efficiency as the improvement approach used in proposed alternative. Software of OpenLCA was generated to run the LCA result supported by commercial databases of Ecoinvent. The system boundaries adopted cradle-to-grave. The result of LCA showed that among 11 impact categories, the highest contribution was addressed to marine aquatic ecotoxicity as 404648013747,487 kg 1,4-dichlorobenzene eq. The process contribution to result occurred as activities from absorption chiller. Therefore, the proposed alternative on heating, ventilating and air conditioning (HVAC) system in building was being concerned. The proposed alternative has designed the centralized-chiller instalation to reduce the energy consumption and cost. Using the Eco-efficiency approach, this method provided ratio of 50,3%. To summarize, this proposed alternative recorded net saving within 2 different period – March and May- resulted to the the energy consumption and cost was reduced as much as 38%.

Keyword : Sustainability, Productivity, PET bottle, Life Cycle Assessment, Eco-efficiency, Net saving