

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

In this study, LCA software “LCSoft” was developed by VBA in Microsoft Office Excel. The software can be used with PROII simulation program to evaluate environmental impact of the design process. LCSoft contains the total of 34 calculation models for calculation of different LCA-items. The output of this software consists of inventory data covering thirteen emission substances, energy and fuel consumption, carbon footprint and life cycle impact assessment for eight impact categories. In addition, LCSoft also provide preliminary database for users such that the users can flexibly change or add the value by themselves upon the situation. The program LCSoft was validated by using two models case study which are acetaldehyde and bio-ethanol process then compared to the results obtained from handed-calculation and a commercial software, SimaPro. When compared with hand-calculation the results showed that LCSoft has worked properly to give the final results. In comparison with SimaPro, the results show that two impact indicators which are GWP and ODP obtained from LCSoft are identical with the results from SimaPro. However, other six impact indicators are still different because these two programs have different set of database sources.

Thus, this LCSoft software can help user to save time used to perform life cycle assessment, this program is simple, easy to use and cheap suit for individual user or student. The environmental impact results obtained from LCSoft can be used for improving the design of process to be more environmental friendly.

Based on the results, several recommendations can be offered as follows:

1. More relevant databases should be included in LCSoft.
2. The LCSoft should have more options for energy for example alternative fuel.
3. Energy and cost allocation should be included in LCSoft
4. Properties prediction model should be added to LCSoft in order to provide more database for environmental impact assessment.