CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, we have successfully conducted Life-Cycle Material Flow Analysis on PVC products in Thailand covering the entire life cycle of the target products which are pipe, fitting, cable, floor tile, floor covering, shoes and hose. The results of this study indicated that PVC products have been released to post consumption phase every year. Moreover, the rate of releasing is increasing every year depending on increasing of PVC product consumption. If we do not have a proper waste management on PVC wastes, they will cause considerable quantity of wastes which is discharged into the environment up to eight million tons in the coming decades, and it can have serious consequences on human life and environment. Four scenarios of PVC end-of-life management were created by varying the ratios of waste managements (recycle, landfill, and incineration). From all end-of-life management scenarios studied, the results indicated that the recycle process had a significant role in reducing PVC waste emission and accumulation in Thailand. From landfill site visits, we went to collect the data from landfill sites covering every region in Thailand. Some of target PVC products such as pipe, profile, and floor tile have not been found so far. PVC cable and hose have been found, but they have a relatively small amount at landfill site. The other places which PVC outflow can be found are recycle shops. Based on 2013 data, it was found that major PVC products such as pipe and hose had been recycled as much as 95% and 63%, respectively. In contrast, not much recycled amount were found from the model for other PVC products such as profile, floor tile, and floor covering.

5.2 Recommendations

Although the Life-Cycle Material Flow Analysis was successfully conducted for on PVC products in Thailand, several recommendations are proposed as follows:

5.2.1 Recommendations for improvement of an accuracy of LC-MFA model

The materials flow into the PVC product metabolism should be the product consumption, not the product production as we used in this study because the product being produced, might not be necessary to be totally consumed in the use phase. In case of using production as an input, it would be better if we used the actual data from the production of the target products instead of the calculation from resin consumption. For the average service lifetime and service lifetime distribution of PVC products, they should be obtained from actual observation in a long period of time.

5.2.2 Recommendations for Improvement of PVC environmental friendly

From the waste management scenario results, it can be seen that mechanical recycling process still plays important role in reducing PVC waste emission and accumulation in environment. Therefore, if the government or industrial associations have a policy to encourage using PVC recycle, it would be pretty good for PVC products in term of environmental friendly.

5.2.3 Recommendations for Improvement of identifying mismatch amount between LC-MFA result and actual result from site visits

From LC-MFA model results and actual site visit results, we can see that a large number of PVC waste are missing from LC-MFA model when it was compared with actual site visit result. Therefore it is imperative to identify that mismatched quantity. Many assumption could be applied to explain this situation. And it would be better if we could obtain the data from actual site visits.

5.2.4 Recommendations for using LC-MFA models to predict the PVC waste in the future

If we plan to extend our study to cover the situation of PVC waste in the future, these LC-MFA model can be used as a tool to predict the incoming waste in nearly future. It would be pretty nice, if AVC or any industrial associations could give the forecast of the amount of production or consumption of PVC products in the future. The foresee result from LC-MFA models will help people see the situation of PVC waste in the future and know how to handle it.