1. Introduction

As diverse activities including participation in international conferences and cooperation with expert institutions in other countries were carried out under governmental leadership, LCA drew much attention from both industry and academia in the mid-90's. A domestic framework for performing LCA was set up through continuous methodology development and advances in relevant databases, and based on such progress, interest in LCA has been accelerating at a rapid pace in the various sectors of Korea. Along with the dynamic activities of government, industry, and academia with respect to LCA, the Korean Society for Life Cycle Assessment (KSLCA) was established in 1997 and has since become the conduit for distributing LCA to different sectors of society and for reporting its research activities, contributing significantly to the strengthening of the Korean LCA infrastructure. In the followings, the current activities of LCA in Korea are briefly explained.

2. Methodology development

Research on methodology development may be largely divided into the two areas of Life Cycle Inventory Analysis (LCI) and Life Cycle Impact Assessment (LCIA). There is a universal understanding on the framework of LCI based on that proposed by ISO and this framework is being utilized here. Therefore, most of research related to LCI has centered on technical issues such as allocation, data quality and data format. On the other hand, the researches and activities related with LCIA are still rather weak in Korea. There have been several fundamental researches on the weighting methodology and the generation of weighting factors that reflect the characteristics of the Korean situation as a part of the national LCA project. Distance-to-target approach was used to calculate the reduction factor for each impact categories and for the weighting factors Delphi-like panel method and AHP method were combined to generate them. For the characterization step in LCIA, so far, most of the studies have
dealt with the characterization models and their indicators at the emission or mid-point level and, thus, the normalization reference values for those indicators which reflect Korean situation are prepared based on the emission or mid-point level characterization models. Now, few attempts have been made to deal with the characterization models and indicators based on the end-point level.

A full LCA study can be very detailed, expensive and time-consuming. If less time, money, and staff are available, as in the cases of many short-lived products and small & medium sized enterprises (S&MEs) products, the development of faster, less precise and more selective LCA methodology is desirable. In an attempt to make LCA more user friendly there have been many attempts to develop simplified LCA methodologies and related software tools. The simplified LCA methodology can be also utilized in the product development by integrating environmental aspects efficiently. The importance of LCA and its role in Design for Environment (DfE) is recognized by both government and industries. Several DfE projects which are supported by the government are carried out to develop both general and product-specific DfE guidelines, to identify the linkage of LCA and DfE, and to develop easy-to-use DfE softwares. In addition, much effort has been made to develop and apply simplified LCA(or checklists, matrix) methodologies which can be used to effectively identify significant environmental aspects associated with a product’s system.

3. Database construction

The government has been making specific efforts to support the development of public databases. In 1998, the Ministry of Commerce, Industry & Energy(MOCIE) undertook a 5-year national research project (1998-2003) for about 100 modules of representative raw materials, energy, processes, transport, and waste treatments. Meanwhile, the Ministry of Environment (MOE) has completed a LCI database construction project over 3 years (1999-2001). The purpose of this endeavor is to build and provide databases that companies can use to build the environmental information of their own products for Type III Environmental Declaration Program. During the first four years of the two national LCA projects (MOE and MOCIE), LCI databases of about 180 representative modules which include raw materials, energy, process, transportation, and waste treatment have been constructed. For next year, the LCI databases of about 20 modules will be added.
4. Policy

In 2000, the MOE incorporated Type III Environmental Declaration Program into the law ‘Development of environmental techniques and related systems’ since there was an increasing demand for the continuous improvement of the environmental aspects of products. The MOE believed that the implementation of the Type III Environmental Declaration Program with LCA information is essential in order to increase a product’s environmental friendliness through green procurement. The administration body, certification body, and training body were designated and the first eight target product groups selected for the certification include automobile oil filter, gasoline, glass, monitor, paper towel, PDP TV, refrigerator, and tire. Now, the product specific guideline for each product group has been developed and the first 33 qualified auditors who completed the training course and passed the qualification examination are authorized. The first certification of the Korean Type III program was awarded in May 2002 and so far six products groups are certified.

5. Case studies

Buoyed by the numerous efforts of government and the KSLCA to promote LCA, the industrial sectors in Korea carried out LCA practices for their own products to evaluate potential environmental impacts associated with their products, and to use LCA results for DfE and the type III environmental declaration program. So far, many of the case studies have been carried out for home electronics and automobiles. That is, most of the case studies are for assembling products rather than material production or material products. This is most likely due to the fact that most of the assembling products are export items and the demand for environmental data is relatively higher than in the domestic market. However, research into material products such as steel, petroleum chemical products, etc. and disposable products such as detergents, packaging materials, etc. clearly show the recent trend of expanding scope of LCA studies in Korea.

S&MEs are beginning to perform LCA even though they are not as active as the conglomerates. Because of the strong requests from big assembling companies several S&MEs which mainly produce parts, components or modules for the final products start to carry out LCA studies. They are also training experts in their own way by participating in LCA-related education programs and workshops sponsored by the
Korean Society for LCA (KSLCA). In addition, the importance of developing LCA guidelines more specific to S&MEs are recognized since in Korea most companies fall into this group. Therefore, the pressure has been put on government, KSLCA, and other relevant institutions to develop LCA guidelines, education programs and easy-to-use software for S&MEs.

6. Summary

LCA in Korea is at the stage of implementing the methodologies already developed abroad and also trying to develop appropriate methodologies. The government has been making specific efforts to induce more active participation and interest from domestic industry, encouraging companies to include the LCA concept and methodology in their environmental policies. Next year will be very crucial for the dissemination and stabilization of LCA in Korea since the 5-year national LCA project will be completed by this time next year, providing methodologies, data format, software and the databases of about 200 modules.

Industries in Korea are not only interested in carrying out LCA studies for their products but also beginning to make efforts to integrate LCA results into the decision making process in order to actually develop more environmentally-friendly products. As more pressure is put on industries to produce green products in the marketplace, there will be more persistent efforts to utilize the LCA results with other environmental management tools such as EMS, EL and DfE. Therefore, it is expected that LCA will continue to gain growing importance within all areas of Korea.