[2]Development of environmental performance evaluation tool for EPD of railway vehicle

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Introduction

Request for objective environmental performance of the product is being increased because quality of life is better than the past. Furthermore, strong requirement of the green growth and sustainable development over the world including environmental regulation and standard, ISO 14064, EuP, WEEE and so on, are also another reason. Under these current situations, Railway industry cannot stay and sustain its better position any more than other transportation industry. Most of the industry except Railway industry is struggling to develop its product more environmentally friendly and get the 3rd party certification like Eco-labelling and Carbon footprint. Although Railway vehicles are more complicate than other product, advanced railway manufacturer, Bombardier, Siemens and so on, did get the certification yet. To get environmental certification, LCA method has to be applied because life cycle approach is needed to respond current environmental requirement. The purpose of this project is to facilitate railway vehicle manufacturer obtaining the environmental certification termed Korea EPD. By doing so, the environmental performance evaluation tool would be developed and modeled within the LCA framework and therefore applied especially for rail vehicle. In order to conduct this project systematically, involvement parties i.e. certified body, LCA research team, rail manufacture and rail institute are collaborated. The period of this project is scheduled to 2011 from 2009.

Methodology

As part interview and discussion among stakeholders, two main current problems are discovered. Firstly, railway vehicle is much more complicate than other general products. Secondly, most product designer and other workers don't have environmental concept and knowledge. As a result, rail vehicle products are manufactured in the absence of environmental analysis. To encourage use of LCA method into railway vehicle, it is needed to make more simplified method. Hence, increasing awareness of making more environmentally friendly railway vehicle, more simplifying method seems to be the best solution. Even this system intends to be simplified; it should satisfy the condition of environment performance evaluation. For the vital perspective, the existing format, procedures including indicators have been gathered and further applied for Korea EPD.

Results

W did simplify procedure of LCA evaluation and suggest uncomplicated structure of railway vehicle. The concept of work is presented in the figure 1. In frame of first year implementation, simplified and uncomplicated LCA system is designed in order to provide an adequate environmental performance evaluation for all interested party of railway vehicle particularly for designer. Its main

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feature is for obtaining the Korean EPD but not limited for covering the international environment standard of ISO 14044, ISO 14025 and so on. The expected results of s-LCA analysis can be shown as the typical environment categories for instant global warming potential, resource depletion, acidification, ozone layer depletion etc, which are required for the certification.

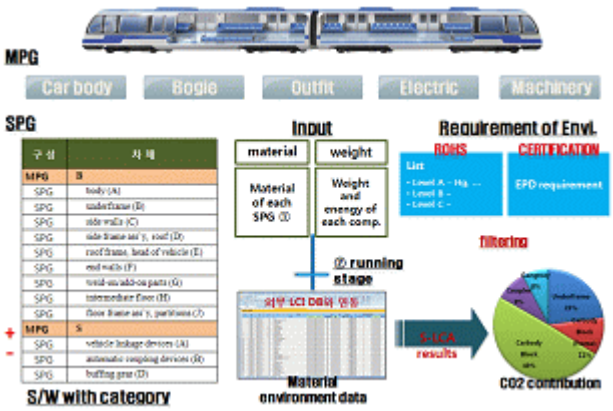

Fig.1 Concept of s-LCA for railway vehicle

There are a number of ways that displays the responsibility on sustainable development, among those LCA results and Korean EPD certification are selected as the key environmental parameter of railway vehicle manufacturer. Generally, LCA and EPD are published as shown in the figure 2.

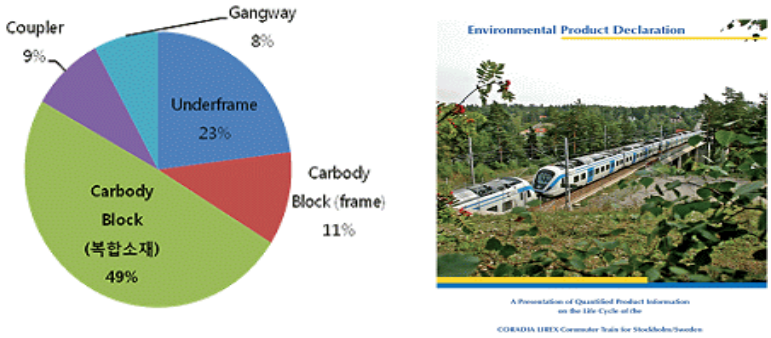

Fig.2 Example of the results of LCA and EPD of railway vehicle

Conclusion

Environmentally sustainable development and green growth can be achieved through providing easy and simple tool for the product designer who is dealing natural resource at first. In this study, objective evaluation procedure and logic is suggested only for complicated product of railway vehicle with the concept of life cycle assessment. And, with the result, railway vehicle can get the environmental certification after not much data treatment. The applicable product of this tool made from current project is just railway vehicle because the s/w contains the general structure of railway vehicle; car body, bogie, interior and so on. Of course, the designer easily can add and remove the

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components if it is not general. With this concept, the evaluation and enhancement of the environmental performance of railway vehicle at the design stage can be easier for designer who is not expert in the LCA field than the past.

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