

The Progress of the Impact Assessment Study Committee in the National LCA Project of Japan*

Norihiro Itsubo

JEMAI (Japan Environmental Management Association for Industry), Ueno 1-17-6, Taito-ku, Tokyo 110-8535, Japan; phone: +81-3-3832-0515, (fax:-2774); e-mail: itsubo@jemai.or.jp; website: <http://www.jemai.or.jp>

A national LCA Project has started in Japan beginning in October last year. The investigations of this project are performed by 3 committees (Inventory, Database and Impact assessment Committees). The detailed structure of this project has been shown previously (YANO, 1998).

Currently, in the field of impact assessment, studies concerned about the establishment of damage functions have been increased to improve the reliability. Such investigations are not enough to apply into impact assessment systematically, because a great number of types of damage (category endpoints) exist and the data which should be collected is huge.

In Japan, several methodologies for valuation have been proposed. However, these methodologies are different in many points such as the considered safeguard subjects and impact categories, the number of substances involved and even the basic ideas. It is difficult for an LCA practitioner to identify these above differences because they are not specialists in most cases. Consequently, it is quite important to provide some information for an LCA practitioner to select methodologies in accordance with their goals.

From these backgrounds, the impact assessment study committee (chairman: Atsushi Inaba, NIRE), has investigated the following 2 items:

1. The development of damage functions for respective category endpoints

This first year, we concentrated on collecting basic data to establish damage functions that are related with greenhouse effects, ozone layer depletion, human toxicity, ecotoxicity and the formation of photochemical oxidants. Based on this data, we tried to perform a continuous assessment that connects emission with the damage in these categories above.

In the investigation of greenhouse effects, the type of damage to the ecosystem, the estimation of submerged area via sea level rise and the decrease in plants via the emission of global warming gases has been carried out.

The investigations concern with ozone layer depletion concentrated on the assessment for the increased number and risk of skin cancer and cataracts via the emission of such ozone depletion substances as CFC-11.

In the investigation of human toxicity, ecotoxicity and photo-

chemical oxidant formation, surveyed basic epidemic and pathological data for the establishment of damage functions and a short case study that estimates the increase in patients and diseases via the emission and exposure of toxic substances have been performed.

There are many requirements for compatible assessment. A lot of substances should be involved in those systems. The data which should be collected is quite large and a lot of discussion should be carried out. Future goals of this research are to solve these requirements.

2. The comparison weighting methodologies proposed in Japan

To clarify the characteristics of impact assessment methodologies proposed in Japan, we applied the same inventory data table to Japanese methodologies and compared the results. 4 valuation methodologies have been compared in Japan (considering Local impact, Estimation consumption of time, Questionnaire, I-O integrated).

MATSUNO and INABA (NIRE) subdivided the geographical range of local impact categories like the formation of photochemical oxidants and consequently established the weighting factors in each area.

YASUI (University of Tokyo) proposed a method to estimate the time consumed by the definition of fatality and the time to meet an environmental crisis.

NAGATA (Waseda University) established the weighting factors that are defined by the results of the questionnaire. This questionnaire have been given by various groups.

ITSUBO (JEMAI) introduced the 2 types of simplified damage functions (input related and output related) to classify the environmental impacts into 2 parts. This procedure considers not only the comparison between impact categories but safeguard subjects.

The applied inventory data concerning copying machines is provided by PE/IKP. The results of impact assessment are quite different in dominant substances and impact category. These differences are dependent on the numbers of substances involved and the impact categories considered in methodologies.

Now, the results of this year are summarized. Some of them will be submitted to this journal.

* YANO, M. (1998): Int. J. LCA 3 (2) 69-70