

**Editorial: Life Cycle Management and Life Cycle Assessment in Japan\*****Yasunari Matsuno<sup>1</sup> and Matthias Finkbeiner<sup>2</sup>**

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The introduction of a section LCM/LCA in Japan within Gate to EHS highlights the important role that Japan is playing in the international LCA-community.

About two years ago, the Int J LCA published a Special Issue 'LCA in Japan', for which we had the honor to serve as editors. We tried to invite papers that allowed representative insights into the LCA activities at that time [1]. In our editorial, we stated that we expected more and important activities in the field of LCA in Japan in the next couple of years and foresee that Japan will become one of the leading countries in the international LCA community. In addition, we tried to encourage Japanese authors to submit their research results to future issues of Int J LCA.

Two years have passed since then and we like to take this opportunity to assess where we stand today. In general, there has been continuous great progress of LCA in Japan.

Concerning the publications in Int J LCA by Japanese authors, five papers have been published after the Special Issue. Mori et al. [2] and Fukushima et al. [3] contributed in developments of methodologies. Kakudate et al. [4], Nakaniwa et al. [5] and Narita et al. [6] presented their LCA related case studies. With regard to the amount of activity in Japan, this number of papers might appear small, however, most of them have been submitted within one year after the Special Issue and published quite recently. In addition, there are some papers by Japanese authors that are currently under review. So, we could say that the Special Issue succeeded in encouraging Japanese authors to submit papers to an international journal.

Apart from publications, there has been other substantial progress of LCA in Japan. The National LCA Project is close to its completion and developed methodologies and a database for LCA practitioners. A lot of Japanese industries are now actually using LCA in the development of their new products, for evaluating the environmental performance of their products. The 5th International Conference on EcoBalance was held in November 6–8, 2002, attracting more than 450 participants. The number of papers presented in the conference was more than 250, an substantial increase from the previous one [7].

Japan plays an important role in the SETAC/UNEP Life Cycle Initiative, because the Research Center for Life Cycle Assessment of AIST (National Institute of Advanced Industrial Science and Technology) is one of the partners, and Dr. Atsushi Inaba from AIST is co-chair of the International Life Cycle Panel, the highest authority of the

initiative. We cannot list all activities here, but the examples given may prove that Japan is already established as one of the leading countries in terms of LCA.

Based on this story, one may ask what the value of a section 'LCA/LCM in Japan' in Gate to EHS might actually be. The answer is, to our mind, two-fold. One aspect are the specific advantages of Gate to EHS in terms of publication speed, the option to provide papers that are too comprehensive for a printed journal, while an executive summary can appear in the printed medium. Apart from research articles, there is also the opportunity to publish magazine-like communications (practical-oriented information, general information, conference reports and topical news & views).

The second answer relates to Life Cycle Management in Japan. On the one hand, the term LCM is still not well recognized by the Japanese LCA society; there is no clear picture or understanding, what LCM actually is. On the other hand, we observe that LCA activities in Japan have recently been broadened and linked with other tools. Concepts such as Industrial Ecology, Integrated Product Policy, etc. have been gradually introduced in Japan. Also being discussed is the linkage of LCA with other tools including Eco Efficiency, Environmental Accounting, Environmental Reporting, Eco-Labeling, DfE, etc. These activities can be already seen as contributions to LCM, because Life Cycle Management is a broader approach, focuses on the application of and education on LCA and LC Thinking [8] and uses a toolbox (several methods besides LCA, e.g. LCC, DfE), rather than just one well-defined method, as is LCA [9].

On the international level, we observe a situation that at first sight might appear strange. LCM as a concept is getting more and more attention, e.g. there was a first international LCM-Conference in Copenhagen in 2001 with about 270 participants [10], an LCM-programme was included in the SETAC/UNEP-Life Cycle Initiative and given high priority within this endeavor and last, but not least, the International Journal of Life Cycle Assessment recently opened a new section for LCM [8]. However, the fact that LCM currently seems to appeal to everyone comes along with a multitude of views and understandings of what it actually means. The proposed definitions of LCM are a real softie, too.

On this background, we think that the Japanese LCA-community can provide a significant contribution to the

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concept of LCM. This section in Gate to EHS hopefully provides an interesting discussion forum on a Japanese perspective towards LCM.

We like to conclude with some personal views on LCM and hope they may serve as an input to the discussion around LCM: The popularity of LCM is not satisfactorily explained by its nebulous nature alone. There seems to be one thing, which is common understanding. LCM is the application of LCA or Life Cycle Thinking. We think, its popularity stems from the inherent promise, that all the good things that the LCA-community has been doing and still does, are getting finally applied, are getting finally relevant in public and private decision-making and that a contribution of this community to an improved environmental situation of our societies can finally be felt. In that sense, we confess to be believers, too.

But how can we get to the promised land? Believing only – whatever the problem is, LCM is gonna fix it – is probably not enough. If we try to take a sober view, LCM has been always there implicitly. The LCA-community always tried to get the methods and results applied. The new thing really is, that the focus has changed. In the past, the focus was method development. The LCA-community obviously followed the notion that if the tools and methods are good enough, then they will be applied almost automatically. Recently, the upcoming of LCM indicates a shift of the focus from 'how to do LCA' towards 'how to use LCA'. As we think that both is still important and relevant, the real merit of this development is to make application aspects explicit and to try to look at them in a systematic manner. We have to learn that LCA-science and LCA-application (LCM) are different kettle of fish.

There is both synergy, but also tension between the scientific development and the application of LCA-methodology. The point is that exactly the mixing of research and application often led to disappointment of the capabilities and usefulness of LCA in the past. We have to be very clear, what we are doing. Are we doing LCA-science or are we doing LCA-application? In the past, we always all pretended to do both at the same time. This time is over. The primary goals and the rules of the game are too different. To run with the hare and hunt with the hounds does no good.

On that background, the focus on methodological discussions has to be critically evaluated. Not necessarily the choice of the 'best' methodology is a crucial point for a successful project, but a meaningful *application* of LCA, which adapts pure methodology to the real world, copes with real industries, with real products, with real data, with conflicting interests and a large number of

stakeholders from government, industry and academia. Let's face it: you can reduce CO<sub>2</sub> with a 'bad' and scientifically poor LCA, if it is applied (albeit not in an optimal way), but you can NOT reduce CO<sub>2</sub> with a 'good' and scientifically brilliant LCA, if it is NOT applied.

The years of childhood of LCA are gone. LCA is mature enough to be already useful today. To grow up further, we have to get better in using LCA, which to our mind is all, what LCM is about. However, progress in LCA research remains important and necessary. It is the basis for application. And there is still a lot to do.

So, we are very happy to announce here that the section 'LCA/LCM in Japan' is being developed in Gate to EHS. We should like to encourage Japanese authors to submit their papers to this section.

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