User Needs Analysis and Development of Priorities for Life Cycle Impact Assessment

Mary Stewart and Olivier Jolliet

1 Department of Chemical Engineering, University of Sydney, Sydney, NSW, 2006, Australia
2 Industrial Ecology & Life Cycle Systems Group, GECOS-Institute of Environmental Sciences and Technology, Ecole Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

*Corresponding author (olivier.jolliet@epfl.ch)

With contributions from Jane Bare, Alan Brent, Mark Goedkoop, Norihiro Itsubo, Ruedi Mueller-Wenk, Claudia Peña, Gerald Rebitzer, Rita Schenk, Helias Udo de Haes and Bo Weidema

Abstract

The development of the LCIA programme of the UNEP/SETAC Life Cycle Initiative started with a global survey of LCA practitioners. There were 91 LCIA-specific responses from all global regions. Respondents gave an indication of how they use LCA with respect to both the stage of LCA that they base decisions on (LCI, LCIA or a combination of both) as well as the types of decisions which they support with LCA information. The issues requiring immediate attention within the UNEP SETAC Life Cycle Initiative identified from this User Needs analysis are the need for transparency in the methodology, for scientific confidence and for scientific co-operation as well as the development of a recommended set of factors and methodologies. Of interest is the fact that results from the different regions highlighted the need for different impact categories. Based on this information proposals were made for new impact categories to be included in LCA (and thus LCIA).

The LCIA programme aims to enhance the availability of sound LCA data and methods and to deliver guidance on their use. More specifically, it aims to 1) make results and recommendations widely available for users through the creation of a worldwide accessible information system and 2) establish recommended characterisation factors and related methodologies for the different impact categories, possibly consisting of sets at both midpoint and damage level. The work of the LCIA programme of the UNEP/SETAC Life Cycle Initiative has been started within four task forces on 1) LCIA information system and framework, 2) natural resources and land use, 3) toxic impacts, and 4) transboundary impacts. All participants willing to contribute to these efforts are invited to contact the LCIA programme manager or to join the next LCIA workgroup meeting that will take place in at the world SETAC congress in Portland on Thursday 18 November 2004.

Introduction

The Life Cycle Impact Assessment (LCIA) Programme is one of the three programmes of the UNEP/SETAC Life Cycle Initiative. The over-arching aim of this programme is to enhance the availability of sound LCIA data and methods; and at to deliver guidance on their use. To initiate the process, UNEP/SETAC convened a Draft Author Team within a definition study to developing guidelines for the development of LCIA, aiming in a first step to:

1) identify user needs for LCIA,
2) identify the objectives and deliverables of the LCIA program appropriate to the needs and concerns of all LCA stakeholders and consistent with objectives identified in prior efforts.

The present programme builds on the ISO series of LCA standards, in particular ISO 14042, the LCIA standard, and its related Technical Specification, ISO 14047. Important predecessors of the present programme are the more than ten years of effort by SETAC in advancing LCA, in North America, Asia and Europe. More specifically, the working groups of SETAC Europe on LCIA established a crucial basis for the identification of best available practice in this field. Also, the initiative builds on the ongoing national projects on LCIA, e.g in Japan, Denmark, Holland, Switzerland, USA; and on multinational initiatives such as the OMNIITOX European project. The LCIA Programme complements and strengthens these important international initiatives. It is designed to avoid duplicating their goals and deliverables, addressing the remaining needs.

In order to meet its goals, the team developed, executed, and evaluated a user needs survey in order to enable worldwide participants to make proposals, suggestions and constructive criticism. The user needs survey provided input for setting priorities on both the information and approaches needed for LCIA. Complete results of this survey were included in a final User Needs Analysis report (Stewart and Goedkoop 2003). The report authors also collected input from workshops. This paper summarises the results of this user needs analysis, the update of the LCIA programme aims and briefly describes present task forces working on LCIA. Further publications will describe the new LCIA framework and ongoing work in more detail.

1 User Need Survey
1.1 Description of the user need survey

The needs analysis provided input to the UNEP SETAC LCIA definition study about issues, categories, values, and priorities for LCIA. The needs analysis was based on responses to
a survey which was circulated globally. The complete needs analysis report can be found on the UNEP SETAC Life Cycle Initiative's web page; this report details:

- **A background to the survey respondents** which includes an indication of the regions from which surveys were received, a breakdown of the industrial sectors in which respondents work, details of the departments (marketing, Research and Development etc) in which the respondents work, the manner in which they use LCA, and the confidence which they place in the information delivered by LCA.
- **Selection and Prioritisation of Issues in LCIA** in which specific issues in LCA were presented and respondents' agreement and/or concerns with these issues gauged.
- **Impact Categories to be included in LCA** which investigated the perceived significance that respondents placed on both existing and potential new impact categories. This section of the report contrasts differences in perception between the entire respondent group, and those responses received from resource extraction (or non-traditional LCA) countries
- **Environmental Values** highlighting the end-points which are of concern to the respondents
- **Specific Requirements of LCIA** that discuss requirements of specific industrial sectors and global regions
- **Conclusions** including remarks on the potential limitations of the survey results, as well as the expectations that respondents have of UNEP SETAC Life Cycle Initiative.

The intention of this paper is to outline and summarise the information presented in the needs analysis report and to demonstrate how information from respondents to the survey has been used to develop the terms of reference for the next stage of the UNEP SETAC LCIA project. This illustrates the manner in which the needs of the broader LCA are being addressed and demonstrates the transparency of the process.

### 1.2 Respondents provenance

Table 1 details the breakdown of the regions from which the 91 completed surveys were received.

<table>
<thead>
<tr>
<th>UN Region</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>5</td>
</tr>
<tr>
<td>Asia and the Pacific</td>
<td>7</td>
</tr>
<tr>
<td>Europe</td>
<td>61</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>5</td>
</tr>
<tr>
<td>North America</td>
<td>11</td>
</tr>
<tr>
<td>Not specified</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>91</strong></td>
</tr>
</tbody>
</table>

The survey results are obviously be dominated by responses received from Europe. This reflects to some extent the fact that a significant amount of global LCA activity is centred in Europe. Notable in their absence are responses from Japan.

**Fig. 1:** Breakdown of sectors in which respondents work

Fig. 1 gives an indication of the sectors in which respondents work. Survey results are dominated by those received from academia; however, the spread of sectors from which responses were received is relatively wide.

In order to avoid results being biased by the Europe or Academia dominating participation, answers were analysed separately for non-traditional LCA regions and for non-academia respondents and compared with all respondents.

### 1.3 How is LCA information used?

Fig. 2 has been included to highlight the manner in which the respondents use LCA information. This information has the potential to inform the link between the LCI, LCIA and LCM elements of the UNEP SETAC Life Cycle Initiative. Fig. 2 demonstrates that, aside from developing LCA software, the majority of respondents either conduct LCAs in order to deliver a baseline assessment of a system, or use LCAs to support decision making processes. The largest class of decisions supported using LCA information are industry decisions.

**Fig. 2:** Breakdown of how respondents use LCA, with further resolution on decisions supported