

background information. Keyword searches by topic and author are possible for both publication forms in one combined database.

Table 1 lists the content we envisage in the area of LCC for the LCM section, though this is doubtless to change and expand in response to user, and author, input.

Table 1: Scope LCC topics

Principle Themes for Peer-Reviewed Publications	Specific Current Topics	Alternative Forms
Indicators	Updates on Intern. Working Groups	Editorials
Input/Output	EU Project Updates	Literature
Methodologies	National Project Updates	Reviews
Activity Based Costing	University/ Laboratory Profiles	Case Studies
Life Cycle Costing	Conference Reports	Commentaries
Total Cost Assessment	Theses	Terminology
Full Cost Accounting (related to external costs)		Internet Links
Relation to other LCM Tools		

We believe that the LCM toolbox, of which LCC is an important part, will be required in new product development, product introduction, supply chain negotiation, environmental product declarations, and cost reduction. A full accounting of the indirect costs which often dominate businesses is good for the bottom line, provides competitive advantages, lowers credit risks, and enhances image. With this vision we would like to invite you to share your expertise, your experiences, but also your views on these topics in this journal.

References

- Blanchard B, Fabrycky WJ (1998): *Systems Engineering and Analysis*. Prentice Hall, Upper Saddle River, New Jersey, USA, p 560
- Brankamp K (1996): *Produktplanung – Produktentstehung*. In: Eversheim W, Schuh G (eds): *Produktion und Management – Betriebs-hütte*, part 1, 7th edition, Springer, Berlin, Germany
- Ehrenfeld JR (2003): *Industrial Ecology and LCM: Chicken and Egg?* Editorial. *Int J LCA* 8 (2) 59–60
- Ehrlenspiel K (1985): *Kostengünstig Konstruieren – Kostenwissen, Kosteneinflüsse, Kostensenkung*. Springer, Berlin, Germany, p 2
- Fussler C (1996): *Driving Eco Innovation*. Pitman Publishing, London, UK
- Heinrich AB, Klöpffer W (2002): *LCM – Integrating a New Section in Int J LCA* (Editorial). *Int J LCA* 7 (6) 315–316
- Hunkeler D, Biswas G (2000): *Return on Environment*. *Int J LCA* (5) 358–362
- Hunkeler D, Saur K, Stranddorf H, Rebitzer G, Schmidt W.-P, Jensen AA, Christiansen K (2003): *Life Cycle Management*. SETAC, in review (to be published in 2003)
- ISO 14040 (1997): *Environmental Management – Life Cycle Assessment – Principles and Framework*. International Standard 14040. International Standards Organization (ISO), Geneva, Switzerland
- Keoleian GA (1996): *Life-Cycle Design*. In: Curran, M. A.: *Environmental Life-Cycle Assessment*. McGraw-Hill, New York, USA, p 6.32
- Rebitzer G (2002): *Integrating Life Cycle Costing and Life Cycle Assessment for Managing Costs and Environmental Impacts in Supply Chains*. In: Seuring S, Goldbach M (eds): *Cost Management in Supply Chains*. Heidelberg: Physica-Verlag, p 128–146
- Rebitzer G, Seuring S (2003): *Methodology and Application of Life Cycle Costing: A New SETAC Europe Working Group*. *Int J LCA* 8 (2) 110–111
- Rowledge LR, Barton RS, Brady KS (1999): *Mapping the Journey*. Greenleaf Publishing, Aizlewood's Mill, UK, p 179

Life Cycle Costing: A New SETAC Europe Working Group

Methodology and Application of Life Cycle Costing

Gerald Rebitzer^{1*} and Stefan Seuring²

¹Swiss Federal Institute of Technology, ENAC-GECOS, CH-1015 Lausanne, Switzerland

²Carl von Ossietzky University Oldenburg, Institute of Business Administration, D-26111 Oldenburg, Germany

*Corresponding author (Gerald.Rebitzer@epfl.ch)

1 Background

Life cycle management (LCM) is a business driven approach including both environmental and economic aspects (Hunkeler et al. 2003). Furthermore, deliberations of the previous SETAC Working Group on LCM, and others, have shown that conventional cost accounting and management has its limits when assessing costs and revenues over the life cycle of a product. Therefore, methods are necessary that can integrate existing financial data and specifically cost information with metrics in life cycle approaches (in the following such methods are summarized under the term life cycle costing – LCC). At present, there is neither scientific nor procedural agreement between the various stakeholders

regarding terminology, methodology, data formats, reporting, etc (James 2002). Therefore, there is a need to develop the methodological background of and application procedures for LCC. In addition, LCA and LCC, when carried out in an integrated manner and from a systems perspective (as in Rebitzer 2002), have a high potential for moving industrial practice towards sustainable development. For further background on the motivation for and potentials of life cycle costing methodology and practice as well as what is encompassed by this concept (see Hunkeler and Rebitzer 2003).

To tackle the aforementioned challenges, a new SETAC Europe Working (WG) on the topic of life cycle costing was launched at the end of 2002.

2 Goals and First Steps of Work

The kick-off meeting of this new WG, organized by the authors of this article, took place on the 5th of December 2002, directly after the SETAC Case Study Symposium and the Meeting of the Society of Industrial Ecology (see Rebitzer et al. 2003). The goal of this meeting was to define the specific objectives of the WG in this broad field and to identify focal areas. The following objectives for the three-year mandate were agreed upon:

- Define state of the art in LCC methodology (survey of existing approaches, definitions, and applications). This will involve contacts and cooperation with communities and experts (research, consultancy, and industry) in Total Cost Accounting (TCA), Supply Chain Costing (SCC), Total Cost of Ownership (TCO), Activity Based Costing (ABC), Value Chain Analysis (VCA), etc.
- Collection and analysis of LCC case studies (if possible, also with inputs/presentations of non-working group members in industry, research, and consultancy). For this, representation from corporate partners in the WG will be critical.
- Analysis of methodological challenges in LCC and LCA integration (e.g., system boundaries, allocation, data definitions and formats, interaction with life cycle inventory analysis (LCI) and life cycle impact assessment (LCIA)).
- Development of an LCC data concept for life cycle management (LCM).
- Development of an LCC Code of Practice/Guideline in the form of a SETAC publication (overall deliverable of WG).

It is also on the agenda to integrate these efforts in the SETAC/UNEP Life Cycle Initiative, where a work program for LCM is being developed at the moment (see Sonnemann 2003 a,b). The chairs of the WG are currently discussing the possibilities of cooperation with the Initiative.

A first outline of single issues and work packages that seem most pressing in the field of LCC was developed during the meeting in Barcelona. These issues can be grouped into:

- Life Cycle Costing Methodology (definitions; goals of LCC; methodological framework; cost indicators; relationship of LCC to cost-benefit analysis, conventional cost management, eco-efficiency concepts, environmental accounting and LCIA, total cost assessment/accounting; aspects of hidden costs; required detail of cost data; uncertainty of future costs; discounting; allocation in LCC).
- Life Cycle Costing in Business (LCC and product-service-systems, role of LCC in LCM; perspectives and actors in the value chain; integration of LCC and life cycle thinking into business practice; integration of LCC into the organizational structure of companies; applications of LCC; waste management and LCC; dealing with confidential cost data).
- Life Cycle Costing and its Link to Life Cycle Inventory Analysis (relation of LCC to LCI; system boundaries and system elements; cost elements and data availability; consistency of data reporting).
- Life Cycle Costing and its Link to Sustainability and Externalities (LCC and sustainability; linkage of LCC to social aspects; relation between LCC and external costs; international developments in internalizing external costs).

The work on some of the aforementioned tasks has already begun; others will follow, though it will probably not be possible to cover the complete areas, and others might still be added. Essentially, the single issues to be dealt with will be determined by the interest of the individuals and their organizations in the international working group. Currently, the WG has 79 members (active and agenda members) from 19 countries from Africa, Asia, Australia, Europe (East and West), and North America. Stakeholders from industry, academia, government, and consultancy are represented in the group.

3 Organization of the Working Group

In addition to intensive work by Email and other forms of electronic communication, it is planned to have two regular meetings a year, in conjunction with the SETAC Annual Meeting (usually in spring) and with the (annual) SETAC Case Study Symposium (usually at end of November/beginning of December). Working meetings on specific issues can be organized in addition.

The group is chaired by David Hunkeler (AQUA+TECH, Switzerland), together with the Vice Chairs Kerstin Lichtenwort (Technical University Berlin, Germany) and one of the authors of this article, Gerald Rebitzer. For further information, please contact one of the chairs directly, preferable via Email (see contact details below).

Contact: David Hunkeler, AQUA+TECH Specialties SA, Chemin du chalet du bac 4, CH-1283 La Plaine CP 28, Geneva, Switzerland (David.Hunkeler@aquaplustech.ch)
 Kerstin Lichtenwort, Technical University Berlin, KF 6, Strasse des 17. Juni 135, D-10623 Berlin, Germany (Kerstin.Lichtenwort@tu-berlin.de)
 Gerald Rebitzer (Gerald.Rebitzer@epfl.ch, see author information above)

References

- Hunkeler D, Rebitzer G (2003): Life Cycle Costing – Paving the Road to Sustainable Development? (Editorial). *Int J LCA* 8 (2) 109–110
- Hunkeler D, Saur K, Stranddorf H, Rebitzer G, Schmidt W-P, Jensen AA, Christiansen K (2003): Life Cycle Management. SETAC, in review (to be published in 2003)
- James K (2002): Making Environmental Costs More Visible and Relevant – How Can It Be Done? Paper presented at Packaging Clean and Green 2002, Australian Institute of Packaging, Melbourne, Australia, March 21–22, 2002
- Rebitzer G (2002): Integrating Life Cycle Costing and Life Cycle Assessment for Managing Costs and Environmental Impacts in Supply Chains. In: Seuring S, Golbach M (eds): *Cost Management in Supply Chains*. Physica-Verlag, Heidelberg, Germany, p 127–146
- Rebitzer G, Fullana P, Jolliet O (2003): Recycling, Close-Loop Economy, Secondary Resources. Report from SETAC's 10th LCA Case Study Symposium, Barcelona, Spain, December 2–3, 2002. *Int J LCA* 8 (2) 106–108
- Sonnemann G (2003 a): Looking ahead to 2003. Corner: UNEP/SETAC Life Cycle Initiative. *Int J LCA* 8 (1) 48
- Sonnemann G (2003 b): International Life Cycle Panel: Decisions for 2003. Corner: UNEP/SETAC Life Cycle Initiative. *Int J LCA* 8 (2) 61