

Book Reviews

ISO/TR 14049

DIN Deutsches Institut für Normung e.V. (Ed.): Environmental management – Life cycle assessment – Examples of application of ISO 14041 to goal and scope definition and inventory analysis (ISO/TR 14049:2000 in German and English) 1st edition. DIN Fachbericht 107, ISBN 3-410-15078-1, ISSN 0179-275X. Beuth Verlag Berlin Wien Zürich, 2001

The publication of a bilingual (German and English) edition of the Technical Report (TR) ISO 14049 offers the opportunity to direct the attention of the LCA community to this very useful report originating from the ISO standardization process [1–4]. Since the English version is identical with ISO TR 14049, my remarks are also relevant to those practitioners planning to acquire this document. With regard to the book, there is an additional short 'National Foreword' in the German part.

In order to understand this text, it is essential to remember that an ISO technical report is 'entirely informative', i.e. a TR is **not** a standard in itself but aims at facilitating the application of a norm. This aim is attempted by giving examples for the most important items of 14041, which are cited word by word in the sections 'context to the standard'. The examples do not belong to one specific LCA/LCI, they are rather chosen for didactic reasons and for the sake of illustration. For instance, in order to explain and illustrate the key issue 'functional unit', chapter 3 introduces the concepts of function, functional unit and reference flow. The sections of 14041 quoted are 5.3.2 and 6.4.4, i.e. scoping and inventory analysis are correctly not seen as separate parts. The painting of a wall is introduced as a simple example for a function. Other examples used are illumination by light bulbs, hand drying and the packaging of beverages. Chapter 4 'Examples of distinguishing functions of comparative systems' refers to 14041 §5.3.2. Special emphasis is given to explain the equivalence of reference flows for a specific functional unit.

Further chapters dealing with important notions in detail are:

- Examples of establishing inputs and outputs of unit processes and system boundaries (chapter 5)
- Examples of avoiding allocation (chapter 6)
- Examples of allocation (chapter 7)
- Example of applying allocation procedures for recycling (chapter 8)

As can be seen from the chapter headings, the most important and – in the case of allocation – also most controversial items are treated in this TR. The most extensive treatment can be found in chapter 8. Recycling is also treated in section 6.4 (Example of allocation avoidance by expanding the boundaries for comparison of systems with different outputs). The example given compares the disposal of 1 kg of plastic via material recycling with the disposal via energy recovery. In order to create a common output (0.8 kg of plastic film + 26 MJ of heat), equivalent processes are defined to be added to the inventories: conventional steam generation for the material recycling option, film production for the energy recovery option.

Allocation has to be applied, according to ISO 14041, if neither dividing the unit processes, nor expansion of system boundaries is feasible. The examples given in chapter 7 refer to 'purely physical relationships' and 'purely economic basis'. In the first case, the allocation between packaging and content for the transport of goods (e.g. beverages) has been chosen. As an example for economic allocation, the bitumen production (5% mass fraction during gasoline/kerosene/gas oil/fuel oil-production) is presented. There is no way of avoiding allocation in this case, since all products are obtained together in one process which cannot be divided, nor can the system be expanded. It is also explained why physical allocation cannot be applied in that case. The price ratio between bitumen and the average price of the other products (0.5) is therefore chosen as the weighting factor for the mass relation (allocation factor = $0.5 \times 0.05 = 0.025$). This clearly shows that the term 'purely economic' is, strictly speaking, not appropriate.

The last two chapters deal with data quality assessment and sensitivity analysis.

Summing up, it can be concluded that this technical report is a very useful help for interpreting and using the standard ISO 14041.

Walter Klöpffer, Editor-in-Chief
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- [1] ISO 14040: Int J LCA 2 (3) 121, 122-123 (1997)
- [2] ISO 14041: Int J LCA 3 (6) 301 (1998)
- [3] ISO 14042 and 14043: Int J LCA 4 (5) 245 (1999)
- [4] ISO/TR 14049 (2000), ISO/TR 14047 (2002), ISO/TS 14048 (2002): Int J LCA 7 (1) 1 (2002)

Further Literature on ISO in Int J LCA

- comparisons, 4 (5) 263-274 (1999), 6 (4) 211-218 (2001)
- EMS, environmental management systems, ISO 14001, 3 (3) 169-178 (1998)
- ISO 14 020, 2 (4) 242-249 (1997)
- ISO 14 024, 2 (4) 242-249 (1997)
- ISO 14 040, 2 (4) 242-249 (1997); 3 (3) 169-178 (1998); 4 (3) 127-132 (1999); 4 (4) 191-194 (1999); 5 (5) 287-290 (2000); 6 (3) 177-179 (2001)
- ISO 14000, 6 (5) 273-280 (2001)
- ISO 14001, 4 (3) 127-132 (1999)
- ISO 14040-series, 6 (6) 325-333 (2001)
- ISO 14042, 5 (6) 319-326 (2000); 6 (2) 114-117 (2001); 6 (5) 265-272 (2001)
- ISO standards, 2 (3) 144-153 (1997), 5 (5) 313-316 (2000)
- ISO, 1 (3) 168-170 (1996); 2 (1) 33-38 (1997); 4 (2) 81-86 (1999); 5 (6) 358-362 (2000)
- ISO, expert review, 1 (2) 113-115 (1996)
- ISO, standardization process, 1 (2) 113-115 (1996)
- ISO/DIS 14042, 4 (2) 75-80 (1999)