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THE CRITICAL REVIEW ACCORDING TO ISO 14040+44 - HOW AND WHY IT CAME ABOUT.

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ABSTRACT

The revision of the ISO standards in 2006 brought changes to the critical review process of the older series (1997-2000). A peer review for LCA-studies was first proposed in the earlier SETAC document (1993). The ISO 14040 standard (1997) took up this proposition and described three types of "Critical review" which are optional in general, but mandatory "for LCA studies used to make a comparative assertion that is disclosed to the public". This strong prescription was further reinforced in the revised standards and stricter, unambiguous formulations were added. The main reasons for introducing the critical review are the improvement of LCA studies, especially if they contain comparative assertions, and the high potential misuse of LCA studies in marketing.

INTRODUCTION

The pioneering "proto-LCA" work, which started around 1970 in the United States, was soon followed by Europe. There was not much growth in the first 15 years, but by the end of the 1980s an unexpected boom occurred. It soon became clear that the new method had a very high potential of misuse, above all in marketing. SETAC recognized the problem and organized workshops, and published frameworks and guidelines. After a few years, the LCA Code of Practice appeared (SETAC 1993; Klöpffer 2006). A Peer review (the term "Critical review" was introduced later by ISO) was suggested to improve the quality and credibility of LCA studies. Although SETAC had proposed an interactive review process, ISO also allows a critical review at the end of the study ("a posteriori"). The ISO standardization process started immediately after the Code had been published. It served as a kind of blue print, but it took seven years (1997 – 2000) to finish the first series of LCA standards 14040-14043 (Marsmann 1997, 2000). The standards were revised only once, in 2006 (Finkbeiner et al. 2006).The only significant change was a tightening of the critical review process. The critical review has not received much attention in the scientific literature, although it plays an important role in the quality assurance of LCA studies (Klöpffer 1997, 2005, 2012; Fava and Pomper 1997; Koffler 2013).

METHODS

The new ISO framework standard (2006) is again called 14040. It cannot be used alone for a full LCA study, since there is one "shall" requirement saying that ISO 14044 shall be used if an actual LCA is done according to the standards. This excludes the possibility that the relatively open standard 14040 is used to invent a less rigorous LCA method "in the spirit of ISO", at least not for public use.

The critical review is defined in the international standard as a "process intended to ensure consistency between an LCA and the principles (14040) and requirements (14044) of the International Standards in life cycle assessment". This reads simply, but is often very difficult to fulfil in practice.

There is a very convenient list of criteria to be used in each critical review. It can serve as a kind of backbone for the review report:

"The critical review process shall ensure that:

- the methods used to carry out the LCA are consistent with this International Standard;
- the methods used to carry out the LCA are scientifically and technically valid;
- the data used are appropriate and reasonable in relation to the goal of the study;
- the interpretations reflect the limitations identified and the goal of the study; and
- the study report is transparent and consistent."

The emphasis is on consistency with the standard. The report should not include unreasonable claims of absolute truth and precision, which can hardly be fulfilled in any study.

The revised definition (2006) for the panel method reads:

"LCA intended to be used for a comparative assertion intended to be disclosed to the public."

This is a very difficult requirement to meet. Alone the intention to derive comparative assertions and the intention to disclose them to the public is sufficient to require the panel method with at least three reviewers (including the chairperson).

The less demanding version of the critical review can now be done by an independent expert, internal or external, who is familiar with LCA and have scientific and technical expertise. Actually, LCAs reviewed according to this requirement are not necessarily small and there may be more than one expert, frequently two (e.g. an LCA expert and a technology and data expert). This version can be used if there are no comparative assertions "intended".

There exists an inconsistency between the title "Panel of interested parties" (14040: 2006 7.3.3) and the text:

"An external independent expert is selected by the original study commissioner to act as chairperson of a review panel of at least 3 members. Based on goal, scope and budget available for the review, the chairperson selects other independent qualified reviewers.

This panel may also include other interested parties affected by the conclusions drawn from the LCA such as government agencies, non-governmental groups, competitors and affected industries."

The discrepancy between the title and the content is the same as in the original version of 1997.

RESULTS

The original claim by SETAC – enhance the quality and thus the credibility – can be achieved by a critical review.

A careful critical review always improves the quality of the LCA study report. Since the results of the review are documented in the review report, the arguments can be checked by the readers. If there is dissent between the critical review panel (or independent expert(s)), the practitioner and/or commissioner can write their position(s) which are also included in the study report.

Due to this transparency, it is hardly possible to make wrong claims using LCA studies – or at least it is much more difficult compared to the time before SETAC and ISO harmonisation and standardisation of LCA.

One element not yet mentioned is the interplay between Commissioner, Practitioner and the Critical review panel (or independent expert). There should be good communication between the three actor groups and especially between the chair of the panel, the leader of the LCA team and the project leader of the commissioner. One or two face-to-face meetings help to create a good climate. A data expert in the review panel may directly communicate with the experts of the practitioner and the commissioner, within the "critical review triangle" (Klöpffer 2005, 2012). Clearly, the triangle collapses if the commissioner does not actively cooperate in the review process. In this case, the critical review process is a dialogue between the independent expert or the review panel and the practitioner. This arrangement often works well, but there are instances where problems arise (Klöpffer 2005).

DISCUSSION AND CONCLUSIONS

The description of the critical review process in ISO 14040 and 14044 (2006) is relatively short and partially inconsistent. This should be improved in the next update of the standard. An important step into this direction is the elaboration of a "Technical specification (ISO TS 14071)" on Critical review processes and reviewer competencies - Additional requirements and guidelines to ISO14044:2006 (ISO 2013), presently (May 2013) at the stage of the third working draft (WD3). The proposed TS gives detailed requirements about many aspects of the Critical review process without changing its original aim and goal.

Although primarily designed for ISO 14044, the TS 14071 could become the basis for improving the review process of other life cycle based standards, e.g. ISO 14046, ISO 14067 and ISO 14025, referring to ISO 14040ff as the base standard.

Particularly in the verification process of Environmental Product Declarations (EPD) according to ISO 14025 the role of the Critical Review needs some clarification. Basis of an EPD is, beside other product specific information, an LCA according to ISO 14040/44. ISO 14025 only addresses the verification of the EPD according to the LCA and respective Product Category Rules. The quality assurance of the underlying LCA is not explicitly addressed in ISO 14025 but in the spirit of ISO 14040/44, the reference document in ISO 14025, it should be a Critical Review (Grahl and Schmincke 2011). Because an EPD is a declaration for only one product and thus a comparative assertion of competing products of different producers is not included, in ISO 14025 a panel for EPD verification is not foreseen and it is usually conducted by one expert. Nevertheless comparison of different EPDs is intended. The application of ISO TS 14071 to the procedure included in ISO 14025 could result in some clarification.

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