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TECHNICAL REFERENCE

Environmental management – Life cycle assessment – Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis

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The Working Group on Greenhouse Gas Management and Product Lifecycle Assessment, appointed by the Technical Committee, to assist in the preparation of this standard, comprises the following experts who contribute in their *individual capacity*:

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Ernst & Young LLP
National Climate Change Secretariat
National Environment Agency
Ramboll Environ
Singapore Institute of Manufacturing Technology
TUV SUD PSB Pte Ltd

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National Foreword

This Technical Reference (TR) was prepared by the Working Group on Greenhouse Gas Management and Product Lifecycle Assessment appointed by the Technical Committee on Environmental Management under the direction of the Environment and Resources Standards Committee.

This TR is identical with ISO/TR 14049:2012 published by the International Organization for Standardization.

This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

Where appropriate, the words "Technical Report" shall be read as "Technical Reference". The references to International Standards shall be replaced by the following Singapore Standards:

International Standard	Corresponding Singapore Standard
ISO 14040	SS ISO 14040
ISO/TR 14049	TR ISO/TR 14049

The comma has been used throughout as a decimal marker whereas in Singapore Standards it is a practice to use a full point on the baseline as the decimal maker.

Attention is drawn to the possibility that some of the elements of this Technical Reference may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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ISO/TR 14049 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 5, *Life cycle assessment*.

This second edition cancels and replaces the first edition (ISO/TR 14049:2000), which has been technically revised.

Introduction

The heightened awareness of the importance of environmental protection, and the possible impacts associated with products manufactured and consumed, has increased the interest in the development of methods to better comprehend and reduce these impacts. One of the techniques being developed for this purpose is Life Cycle Assessment (LCA). To facilitate a harmonized approach, a family of standards on life cycle assessment (LCA), including ISO 14040, ISO 14044 and this Technical Report, is being developed by ISO. These International Standards describe principles of conducting and reporting LCA studies with certain minimal requirements.

This Technical Report provides supplemental information to ISO 14044:2006, based on several examples on key areas of ISO 14044 in order to enhance the understanding of the requirements of ISO 14044.

With respect to the various phases of LCA, methodological requirements for conducting LCA studies are provided in ISO 14040 and ISO 14044.

Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis

1 Scope

This Technical Report provides examples about practices in carrying out a life cycle inventory analysis (LCI) as a means of satisfying certain provisions of ISO 14044:2006. These examples are only a sample of the possible cases satisfying the provisions of ISO 14044. They offer “a way” or “ways” rather than the “unique way” for the application of ISO 14044. These examples reflect only portions of a complete LCI study.

2 General

The examples focus on six key areas of ISO 14044:2006 as indicated in Table 1.

In some key areas there is more than one example. The reason is that in many cases more than one practice exists. The decision about the application of one or the other practices is goal dependent and can vary e.g. from the product system under investigation or in the stages over the life cycle. The examples are described in the context of the corresponding provisions of ISO 14044 and with the specific use.

In the description of the different cases, whenever possible, the following structure has been adopted:

— context of ISO 14044;

— overview;

— description of the examples.