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Environmental management — Material flow cost accounting — Guidance for practical implementation in a supply chain

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 207, *Environmental management*.

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Introduction

The aim of this document is to provide guidance for the practical application of material flow cost accounting (MFCA) in supply chains. MFCA is an environmental management accounting tool that assists organizations in creating a better understanding of their material and energy uses, the losses and the associated costs caused by material inefficiencies. The application of MFCA within an organization is explained in ISO 14051. Extending the scope of MFCA to multiple organizations in a supply chain will enable them to develop an integrated approach to more efficient use of materials and energy. This can result in various economic and environmental benefits for different organizations in the supply chain. These include reducing total material losses (main materials, energy and auxiliary materials) and thereby providing common opportunities to reduce costs, enhance environmental performance (e.g. GHG reduction and higher material/energy efficiency) and increase trust, collaboration, and fruitful business relationships. A trusted relationship between the different organizations in the supply chain and the increased common understanding of their own situation promotes collaboration. This can also be an incentive for long-term contracts through mutual MFCA-cooperation.

In order to achieve the benefits of an MFCA project extended to the supply chain for all organizations, it is a precondition that the collaborating organizations are committed to share information on processes and related material and energy flows to create a comprehensive understanding of the production system for the effective implementation of MFCA.

When applied in the supply chain, MFCA can improve existing supply chain management information sharing, communication mechanisms and management practices between suppliers and the purchasing department of organizations, which is the key connector between suppliers and customers. MFCA can complement existing environmental management and management accounting practices.

In addition, a thorough assessment of the material flows and energy use along all stages of the supply chain can also serve as a basis for comprehensive sustainability management. For example, MFCA information can be used for monitoring environmental indicators, or help in identifying and mitigating risks in the supply chain.

This document provides guidance on the following topics:

— the significance of integrating MFCA between organizations;

— a general approach for enhancing material and energy efficiency in the supply chain;

— steps for implementing MFCA in the supply chain.

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Environmental management — Material flow cost accounting — Guidance for practical implementation in a supply chain

1 Scope

This document provides guidance for the practical implementation of material flow cost accounting (MFCA) in a supply chain. MFCA fundamentally traces the flows and stocks of materials within an organization, quantifies these material flows in physical units (e.g. mass, volume) and evaluates the costs associated with material flows and energy uses. MFCA is applicable to any organization that uses materials and energy, regardless of its products, services, size, structure, location, and existing management and accounting systems. In principle, MFCA can be applied as an environmental management accounting tool in the supply chain, both upstream and downstream, and can help to develop an integrated approach for improving material and energy efficiency in the supply chain.

This document is based on the principles and general framework for MFCA described in ISO 14051.

The MFCA framework presented in this document includes scenarios for improving material and energy efficiency in a supply chain, principles for successful application of MFCA in a supply chain, information sharing, and practical steps for the implementation of MFCA in a supply chain.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14050, *Environmental management — Vocabulary*

ISO 14051, *Environmental management — Material flow cost accounting — General framework*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14050, ISO 14051 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
energy efficiency
ratio or other quantitative relationship between an output of performance, service, goods or energy, and an input of energy

3.2
initiating organization
organization in the supply chain that introduces the MFCA process to its supplier(s) and/or customer(s) for the purpose of having a collaboration in reduction of material and energy losses

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3.3
material efficiency
ratio or other quantitative relationship between an output of performance, products or service and an input of material

3.4
supply chain
sequence of activities or parties that provides products or services to the organization

Note 1 to entry: For the purposes of this document, a supply chain consists of at least two organizations, of which one organization purchases a material, a part or an intermediate product from a supplier or sells products to a customer.

[SOURCE: ISO 26000:2010, 2.22, modified — Original Note to entry has been deleted and new Note to entry has been added.]

4 Material and energy efficiency in a supply chain

4.1 Roles of an initiating organization in a supply chain

For the purposes of this document, an initiating organization will start the process of applying MFCA in its supply chain. This can be done by jointly analysing MFCA opportunities with suppliers, by discussing MFCA-related improvement opportunities with customers, or by simultaneously addressing MFCA-related improvement opportunities with one or several suppliers and/or one or several customers.

4.2 Generation of material losses from the viewpoint of a supply chain

The main objective of MFCA is to enhance material and energy efficiency. This can be achieved by reducing material and energy losses and by reducing the material use in products. In many cases, this can be achieved within an organization without reference to other organizations. In other cases, collaboration between two or more organizations in a supply chain can achieve even more reduction of total material losses throughout the supply chain. Figure 1 illustrates material losses in the supply chain.

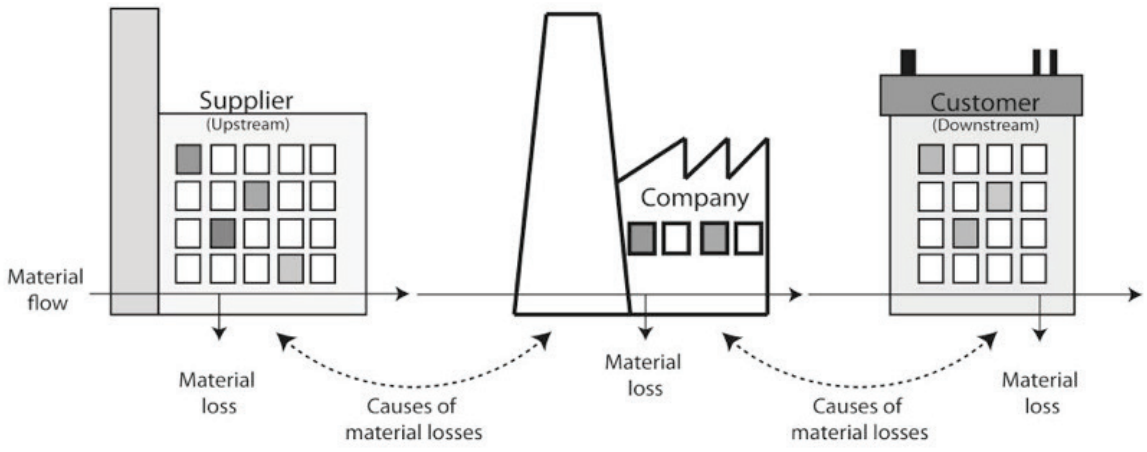


Figure 1 — Understanding material losses in the supply chain

In an upstream process in the supply chain, material losses may be due to various causes (e.g. dimensions or variations in quality of supplied materials). In a downstream process, an excessive degree of precision (design and specifications) or an excessive standard of quality required by the customer may also lead to material losses.

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