



Life Cycle Assessment
A product-oriented method
for sustainability analysis

UNEP LCA Training Kit
Module c – Goal and scope definition



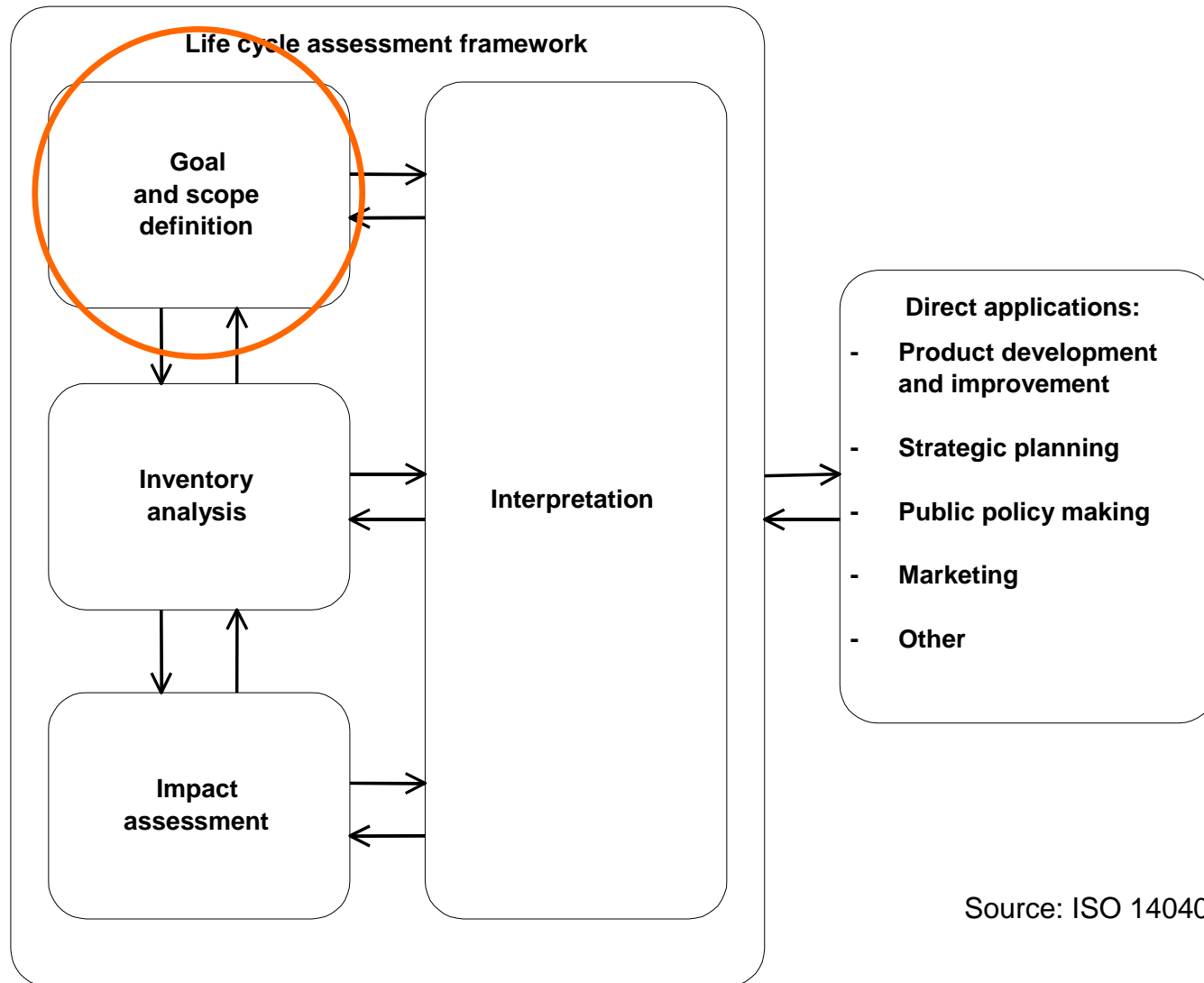
UNEP

Life Cycle



Initiative

ISO 14040 framework



Life cycle goal and scope definition

- **Goal and Scope definition** is the LCA phase in which the aim of the study, and in relation to that, the breadth and depth of the study is established.
 - International Standard ISO 14044
 - Technical Report ISO/TR 14049
- **It is the first phase of an LCA.**



Contents

- **Purpose of LCA**
- **Goal of the study**
- **Scope of the study**
 - **function, functional unit and reference flow**
 - **initial choices** (system boundaries, data categories, inputs and outputs, data quality, critical review)
 - **critical review and other procedural aspects**

Purpose of LCA

- **The purpose of LCA is to compile and evaluate the environmental consequences of options for fulfilling a certain function.**
 - descriptive mode of LCA
 - change-oriented mode of LCA ←

Purpose of LCA

- **Questions asked in descriptive LCA:**
 - Which environmental problems can be attributed to a certain product?
 - What is the share of a certain product in the world's environmental problems?

Purpose of LCA

- **Questions asked in change-oriented LCA:**
 - What changes in environmental problems occur if option B is replaced by option A?
 - What are the environmental problems of choosing option A rather than option B for fulfilling a certain function?


Purpose of LCA

- **Variety of change-oriented questions:**
 - **Occasional choices**
 - Take train or plane for business meeting next week?
 - **Structural choices**
 - Take train or plane for weekly business meetings? ←
 - **Strategic choices**
 - Invest in rail infrastructure or airports?

Purpose of LCA

- **The LCA method and even its scientific basis will depend on the purpose of the LCA.**
 - **Descriptive LCA**
 - based on “logic”: axioms, definition, theorems
 - **Change-oriented LCA**
 - based on “science”: empirically established models, inductive

Types of LCA study

- **Descriptive mode** → attribution problem
- **Change-oriented mode**
 - occasional choices → LP/OR-models
 - structural choices → mainstream LCA ← 
 - strategic choices → scenario analyses

Goal definition

- **Intended application**
 - product development and improvement
 - strategic planning
 - public decision making
 - marketing
 - other
- **An LCA's final application may differ from intended application.**

Goal definition

- **Goal, application, decision to be supported**
- **Parties involved:**
 - researcher(s)
 - commissioner(s)
 - target audience(s)
 - steering/supervising committee
 - expert reviewer(s)

Goal definition

- **ISO’s “comparative assertion disclosed to the public”**
ISO 14044 defines as an “environmental claim regarding the superiority or equivalence of one product versus a competing product which performs the same function.”
- ISO 14044 specifies nine evaluation steps required for “comparative assertions” that are made to the public.

Goal definition

- **Is LCA the most appropriate tool to solve the problem?**

Scope definition

- Change-oriented, structural decision(s)
- Detailed LCA
- Temporal coverage
- Geographical coverage
- Technology coverage
- Coverage of processes
- Coverage of interventions and impacts

Scope definition

System qualities to identify:

- Identification of system function
- Identification of functional unit
- Selection of alternatives
- Determination of reference flow for each alternative

Scope definition

- **Example:**
 - Function: lighting a room
 - Functional unit: 1000 hours of 1250 lumen light
 - Alternatives: incandescent, fluorescent and compact fluorescent



Scope definition

- **Example** (continued)
 - **Reference flows**
 - 1000 hours fluorescent tube 1250 lumen light
 - 1000 hours compact fluorescent 1250 lumen light
 - 1000 hours incandescent 1250 lumen light



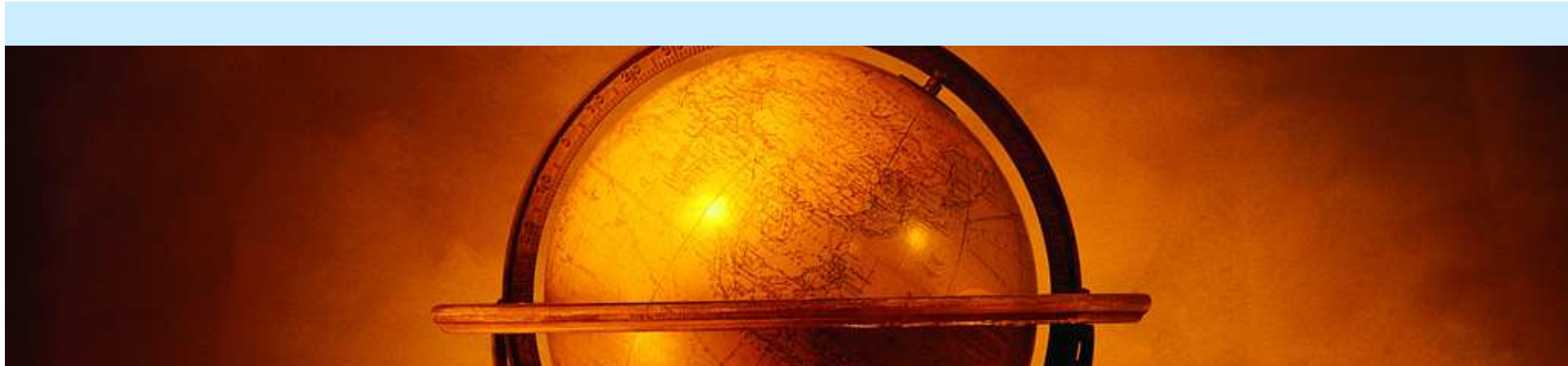
Scope definition

- **Functional unit:** exercises
 - **electricity** (coal, oil, wind)
 - **beverage containers** (one-way, reusable)
 - **potatoes** (traditional, organic)
 - **paint** (alkyd, acryl)
 - **TV** (normal, plasma)
 - **communication** (paper, telephone, e-mail)



Are there segments you wish to review from this module?

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This is an overview of the remaining modules in the toolkit.

Module	contents
d	Inventory analysis
e	Impact assessment
f	LCA interpretation
g	Allocation in LCA
h	LCA mathematics
i	LCIA mathematics
j	Life cycle costing
k	Uncertainty in LCA
l	Carbon footprint