LCA – Goal and scoping

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Definition and purpose of LCA

- ISO 14040: Compilation and evaluation of the inputs and outputs and the potential environmental impacts of a product system throughout its life cycle

- Weidema: The purpose of life cycle studies is to assess the environmental impacts of potential product substitutions (the choice of one product instead of another)

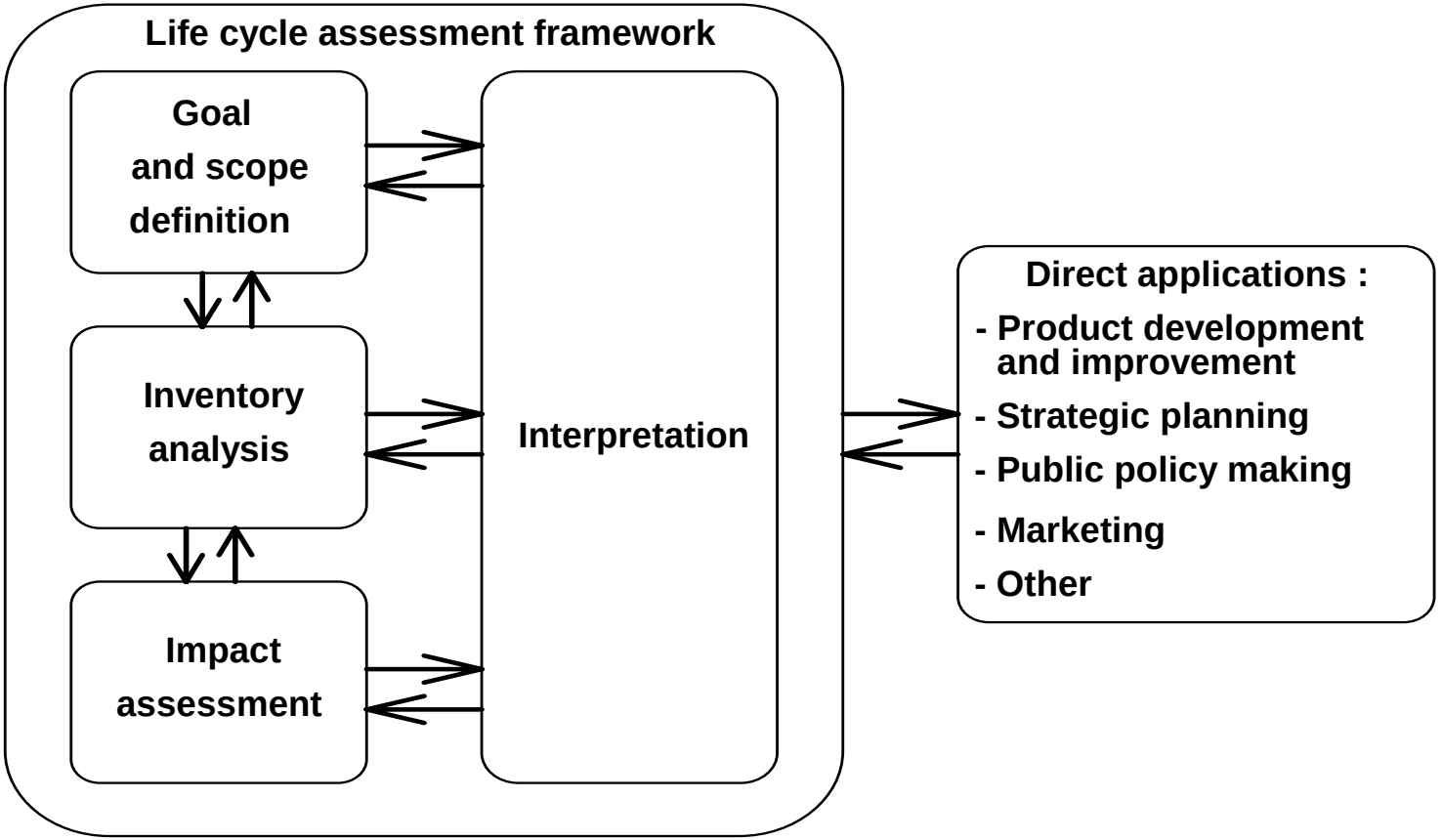
LCA
One tool – many applications

- Eco-design
- Environmental Product Declarations
- Eco-labelling criteria
- Green procurement
- Guidance for sector policies (incl. waste management)

Guidelines and standards

- Reports from SETAC Workshops/Working groups
- Dutch guideline (CML 1992; 2001)
- Nordic guidelines (1995; DK 2003)
- Swiss impact assessment methods (Critical volume, Eco-scarcity, IMPACT 2002+)
- Swiss databases (ETH; Ecoinvent)
- ISO 14040 and 14044

Overview of the LCA procedure



Definition of goal and scope

- Addressing the right issues for decision-making
- Getting the system boundaries right
- Selecting what impacts to consider

- Example on system boundaries:
  - APEAL study on packaging waste collection
- Example on impact categories:
  - Gross list to choose from, with indication of importance

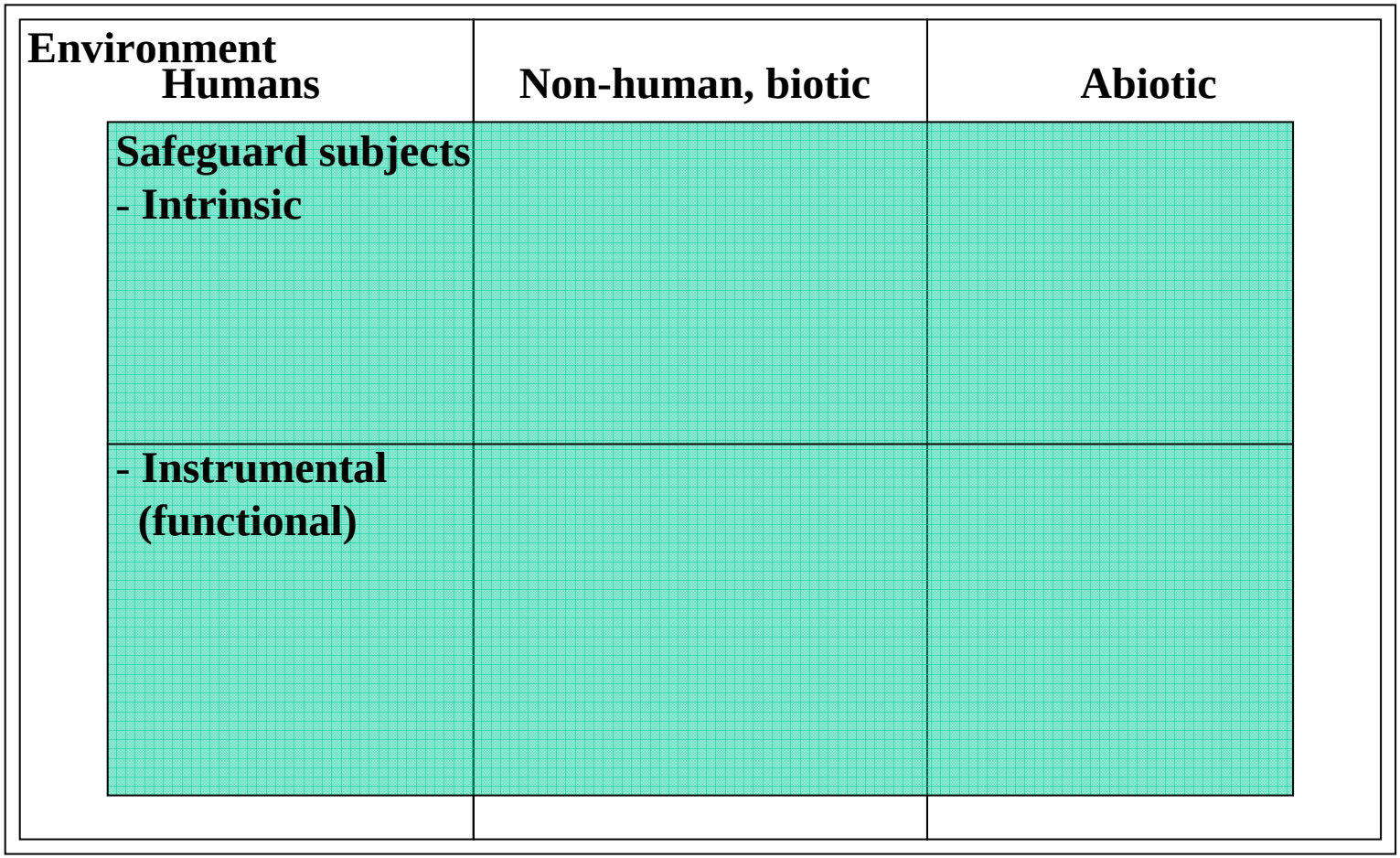
Example: APEAL study on packaging waste collection

- Comparing deposit systems with multi-material kerb-side collection
- Conclusion:
  - Deposits systems should “not be implemented under any circumstances”
- Critical assumptions:
  - Introduction of deposit system does not change total amount of packaging collected
  - Retailer’s space for take-back calculated as sales loss
  - Extra car trips for returning packaging to shops (45% of total global warming impact)

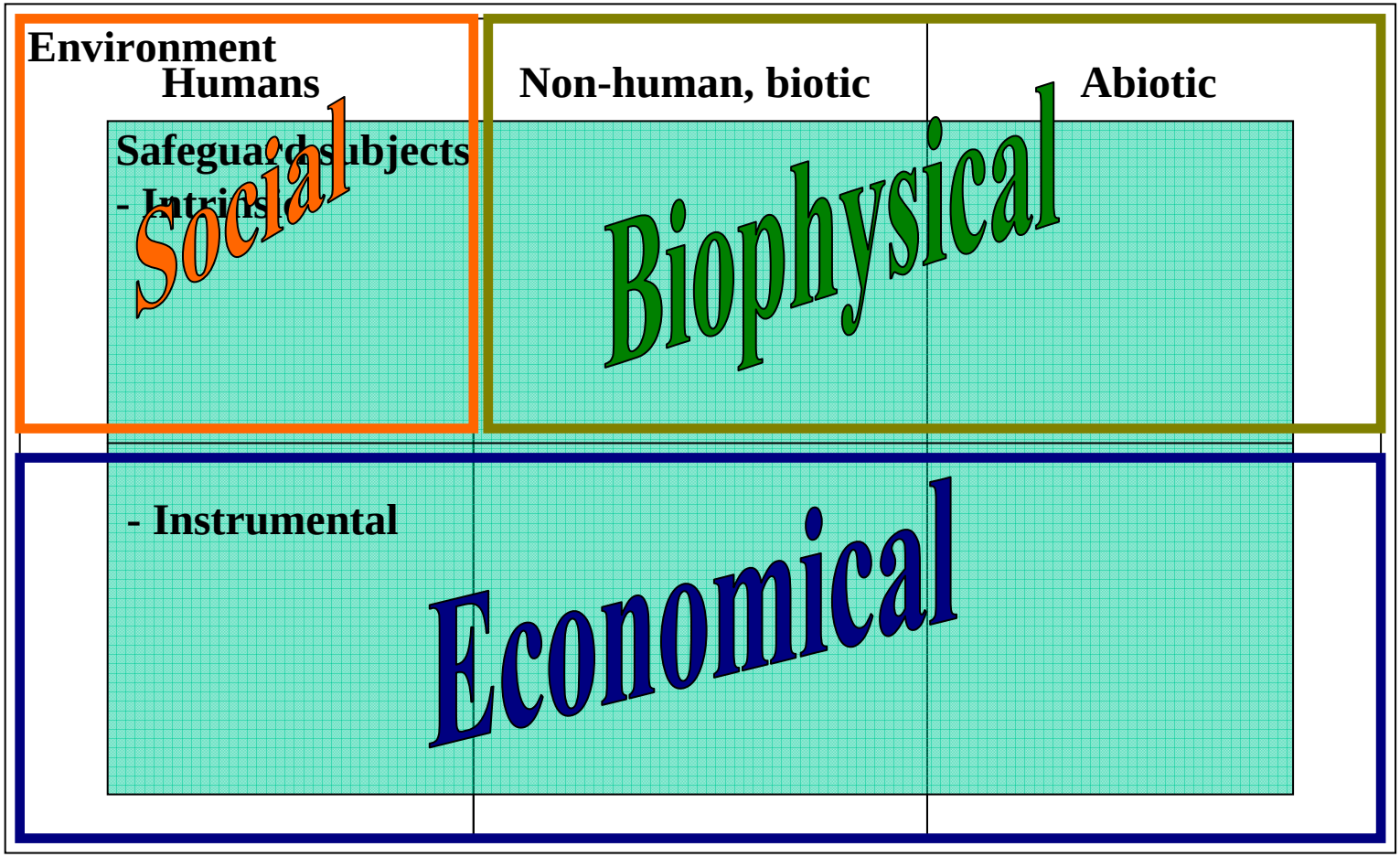
Definition of goal and scope: Impact categories to consider

Environment Humans	Non-human, biotic	Abiotic

Safeguard subjects



Safeguard subjects related to the three areas of sustainability



What contributes to impacts on human health?

- Poverty-related diseases (50 DALY/1000 capita)
- Accidents (14)
- Occupational health (7)
- Respiratory inorganics (6)
- Noise (2)
- Human toxicity (0.3)
- Food-borne diseases (0.3)
- Global warming (0.2)
- Ionising radiation (0.1)
- Ozone-layer depletion (0.2)

Non-health contributions to impacts on human well-being

- Political exclusion (39 QALY / 1000 capita)
- Child labour (38)
- Infringement on freedom of expression (38)
- Excessive work (32)
- Inequity in opportunities (26)
- Inadequate access to health care (23)
- Violation of worker's rights (22)
- Unwanted pregnancies (16)

What contributes to impacts on biodiversity?

- Nature occupation (26% of global area)
- Global warming (20)
- Invasive alien species (9)
- Nutrification (4)
- Acidification (2)
- Photochemical ozone (1)
- Ecotoxicity (1)
- Overexploitation of biotic resources (?)

What contributes to impacts on the economy?

- Production costs (17000 $USD_{2000PPS}$/cap.)
- Loss of education (9700)
- Loss of social infrastructure (5900)
- Health and other work-disabling impact (5800)
- Trade barriers (5200)
- Loss of physical infrastructure (4500)
- Loss of biotic production (2000)
- Unemployment and underemployment (960)
- Depletion of mineral deposits (2)