

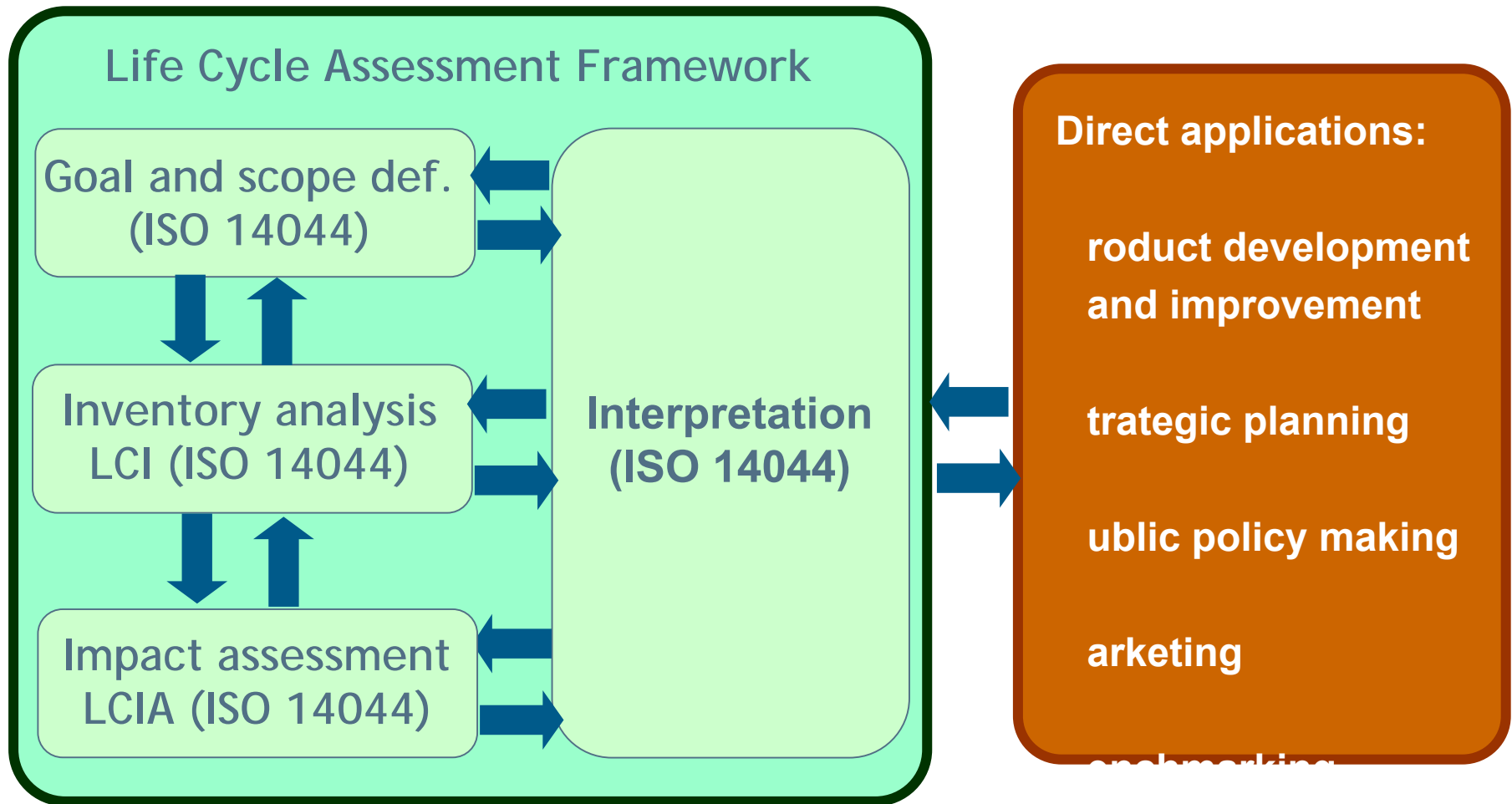


# MODELLING PRINCIPLES FOR THE COLLECTION OF CONSISTENT AND COMPREHENSIVE LCI DATA

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1. Life Cycle Assessment
2. Introduction / Aim
3. EcoSpold
4. Data Collection and Modelling Principles
5. Conclusion

LCA identifies and assesses existing and potential environmental impacts associated with services/products delivered to societies



- All LCA studies conducted in New Zealand include overseas Life Cycle Inventory (LCI) data
- Mid- to longer-term solution: New Zealand LCI database (combined with Australia?)
- Widespread LCI data Format: EcoSpold

## Aim of Presentation:

Giving an overview on modelling principles used in the **current Swiss ecoinvent** and the **planned future Australian LCI database** as starting point for a **future NZ LCI database** discussion

- LCI data exchange format
- Derived and simplified from SPOLD 97/99
- Adapted to ISO 14048 data documentation Format
- Independent of LCA software tools
- EcoSpold Software is open source Software

## Ecoinvent data documentation process

### Meta information

Process information

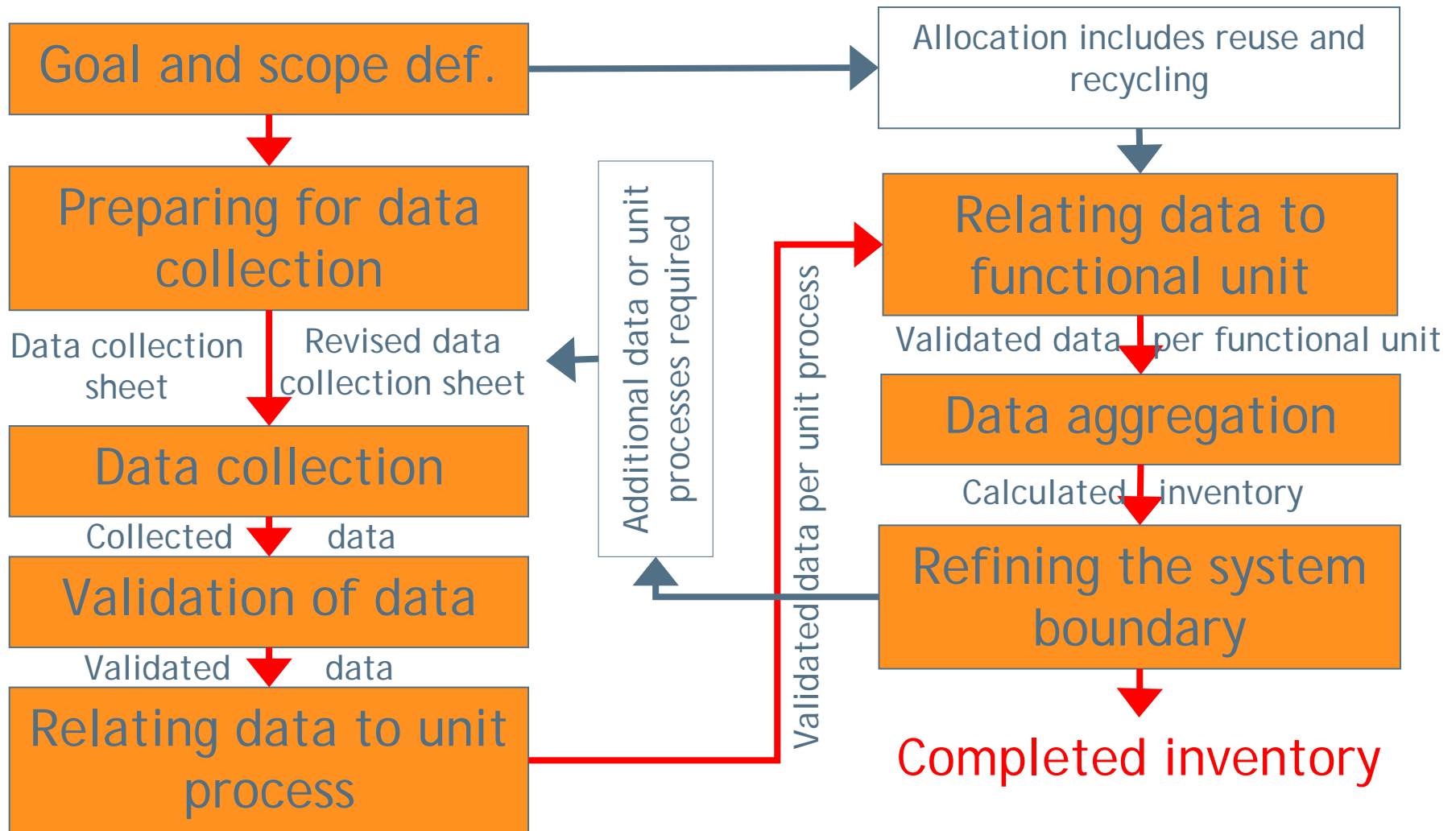
Modelling and  
validation

Administrative  
information

### Flow data

Exchanges

Allocation

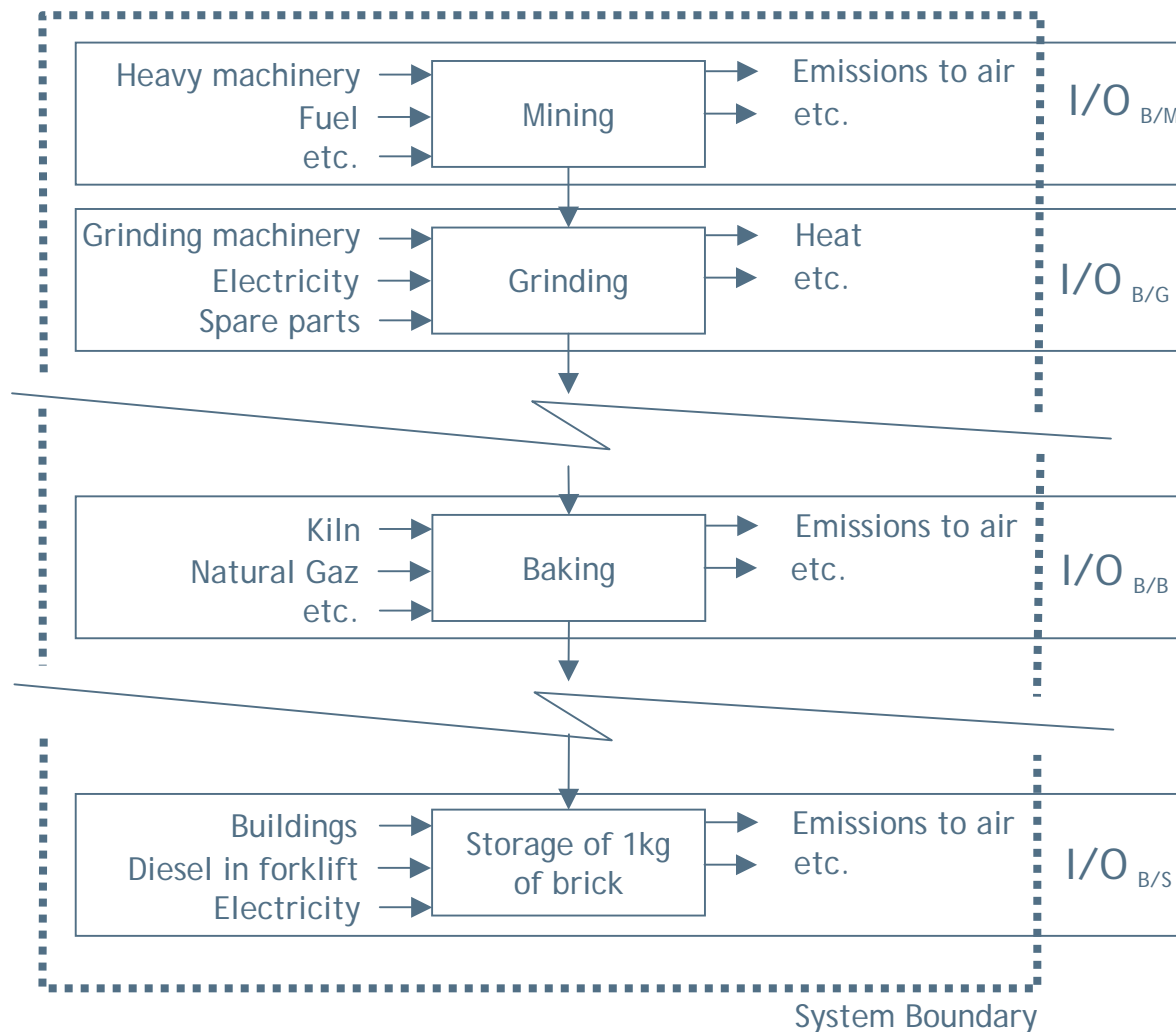


## INTRODUCTION

- Possible data types:
  - ▶ Primary data from specific facilities
  - ▶ Secondary data from published sources

→ Study concentrates on primary data

UNIT PROCESS RAW DATA



## GEOGRAPHICAL SCOPE

- Important for NZ because market is infiltrated by imported products
- Ecoinvent: Goods and services described at the level of economic regions (e.g. cement)
- AUSLCI: Non-domestic products should be modelled as Australian products

## TEMPORAL SCOPE

- Target a certain year of validity for the whole database → increases transparency and facilitates future updates
- If no data available for that year, the published date must be declared
- Emissions inecoinvent are included without temporal boundary

## TECHNICAL SCOPE

- Technology presented in the dataset should be clearly defined
- Ecoinvent: average technology in operation in the year 2000

## CUT-OFF RULES

- Criteria: mass, energy and environmental relevance
- Ecoinvent: no rules; expert judgement
- AUSLCI:
  - ▶ Mass or energy flow  $< 1\%$  may be excluded
  - ▶ Total exclusion not more than 5%
  - ▶ Items with significant impact must be included

→ **Expert knowledge in any case very important**

## CAPITAL GOODS (one possible Definition)

“the basic facilities, equipment, and installations needed to provide the utility products and services crucial for the growth and functioning of an economy, community or organisation”

Frischknecht et. al (2007), The Environmental Relevance of Capital Goods in LCA of Products and Services, Int. J. of LCA

## CAPITAL GOODS

- Depending on the definition, infrastructure can be the driver of certain impacts (e.g. wind power)
- Materials: impact from infrastructure usually make < 10% of total impact
- Ecoinvent: includes capital goods
- AUSLCI: estimates of infrastructure are to be included

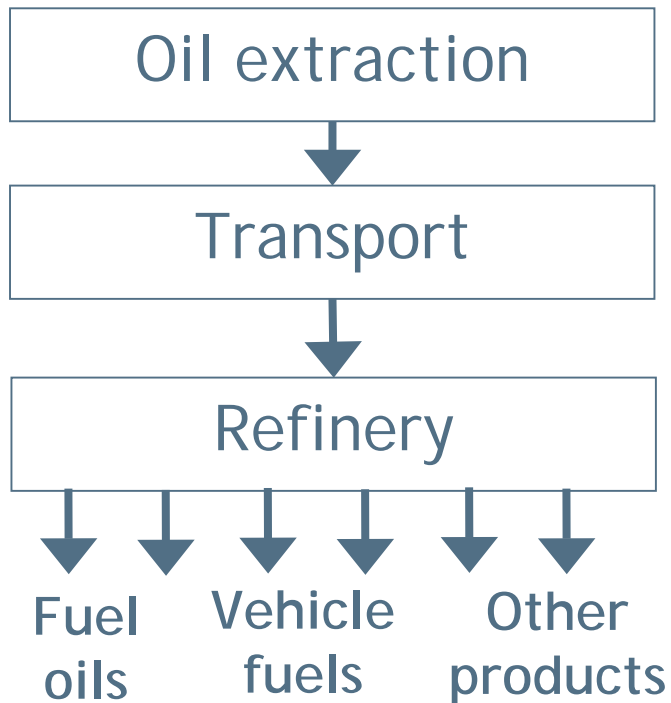
## TRANSPORT

- Ecoinvent: offer generic transport datasets for air, rail, road and water transportation (reference unit: 1tkm)
- AUSLCI: plans a standard unit available for average transport modules to be used by all other inventories unless
  - ▶ it's a significant input
  - ▶ likely to be different from the average mix

## WASTE TREATMENT

- Ecoinvent: Waste treatment is a technical system and therefore modelled like a process
- For NZ: Disposal options are very limited (mainly Landfilling)
- Therefore a default disposal dataset would be very useful

## ALLOCATION AND MULTI-OUTPUT PROCESS



### Allocation:

Partitioning the input or output flows of a unit process to the product system under study

## ISO ALLOCATION PROCEDURE (ISO 14044)

1. Whenever possible allocation should be avoided by
  - ▶ Increased level of detail of the model
  - ▶ System expansion
2. Where allocation cannot be avoided the environmental loads should be partitioned between the system's different functions based on underlying physical relationship.
3. Where physical relationships alone cannot be established or used, allocation may be based on **another relationship** such as economic value of products.

## ALLOCATION AND MULTI-OUTPUT PROCESSES

- Ecoinvent: Multi-output unit processes are entered into the database before allocation. Allocation factors defined and attributed separately
- AUSLCI: Multi-output processes shall be documented in an unallocated form, with the allocation factors for individual product streams specified

The following modelling principles need clarification before data is collected:

- Land-use
- Uncertainty consideration
- Recycling

- New Zealand must soon start a serious discussion on an appropriate future strategy
- To avoid a long and cost intensive process it is recommended to follow the Australian example and to represent New Zealand's interests within that database

**The End**

**Thank you for your attention**