

# Communicating LCA results: Pragmatic tools and methods

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# This presentation

- Part 1: Impact assessment
  - The Eco-indicator 99, benefits of endpoint modeling
  - Different aggregation levels and their application
- Part 2: Software tools
  - Implementation: define goal and scope first
  - Audiences, users and their requirements
  - Tools for non LCA experts

# LCIA methods

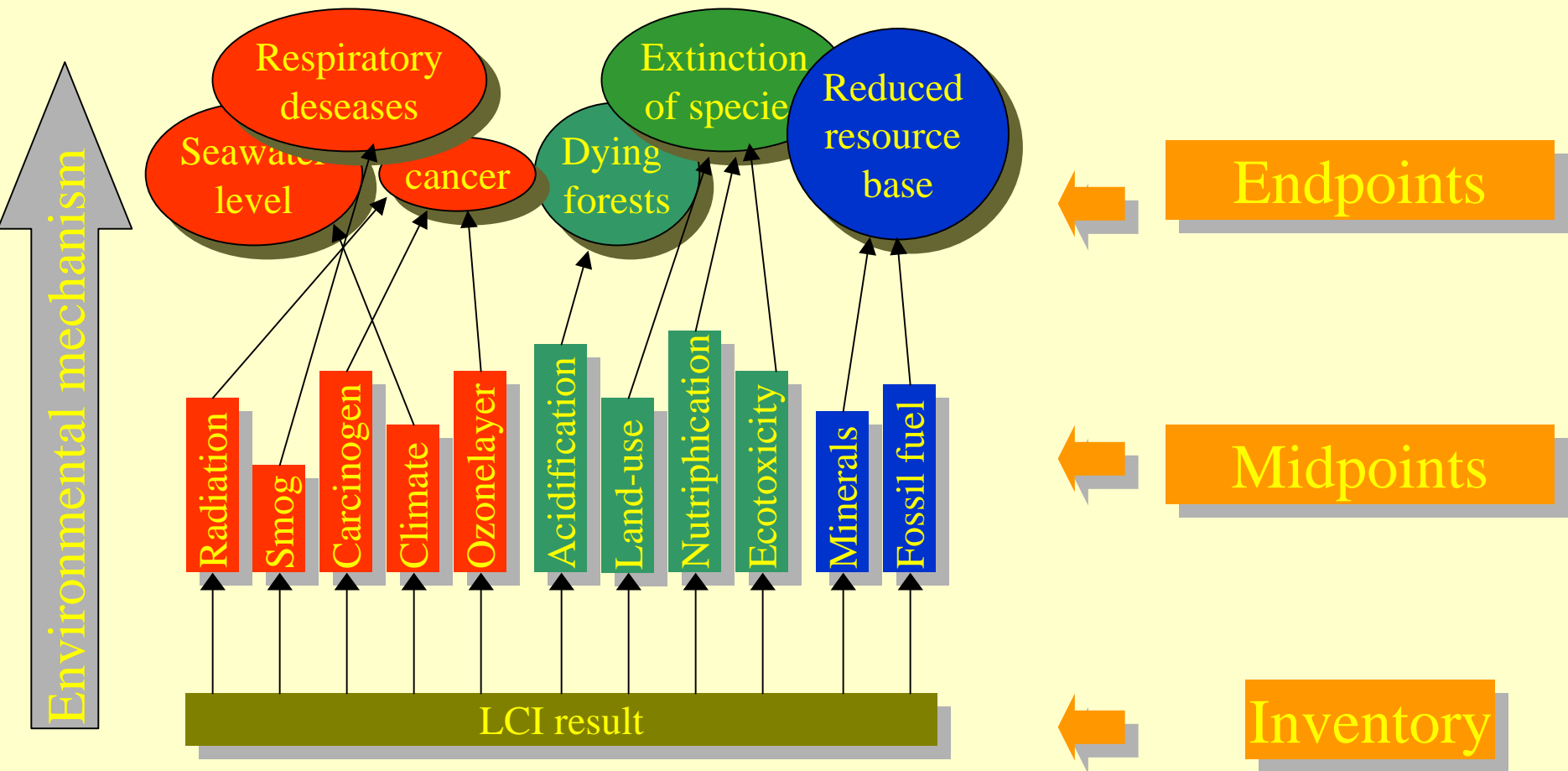
## Eco-indicator 99

- Category indicators at endpoint level
- Focus on interpretation and weighting
- Top down

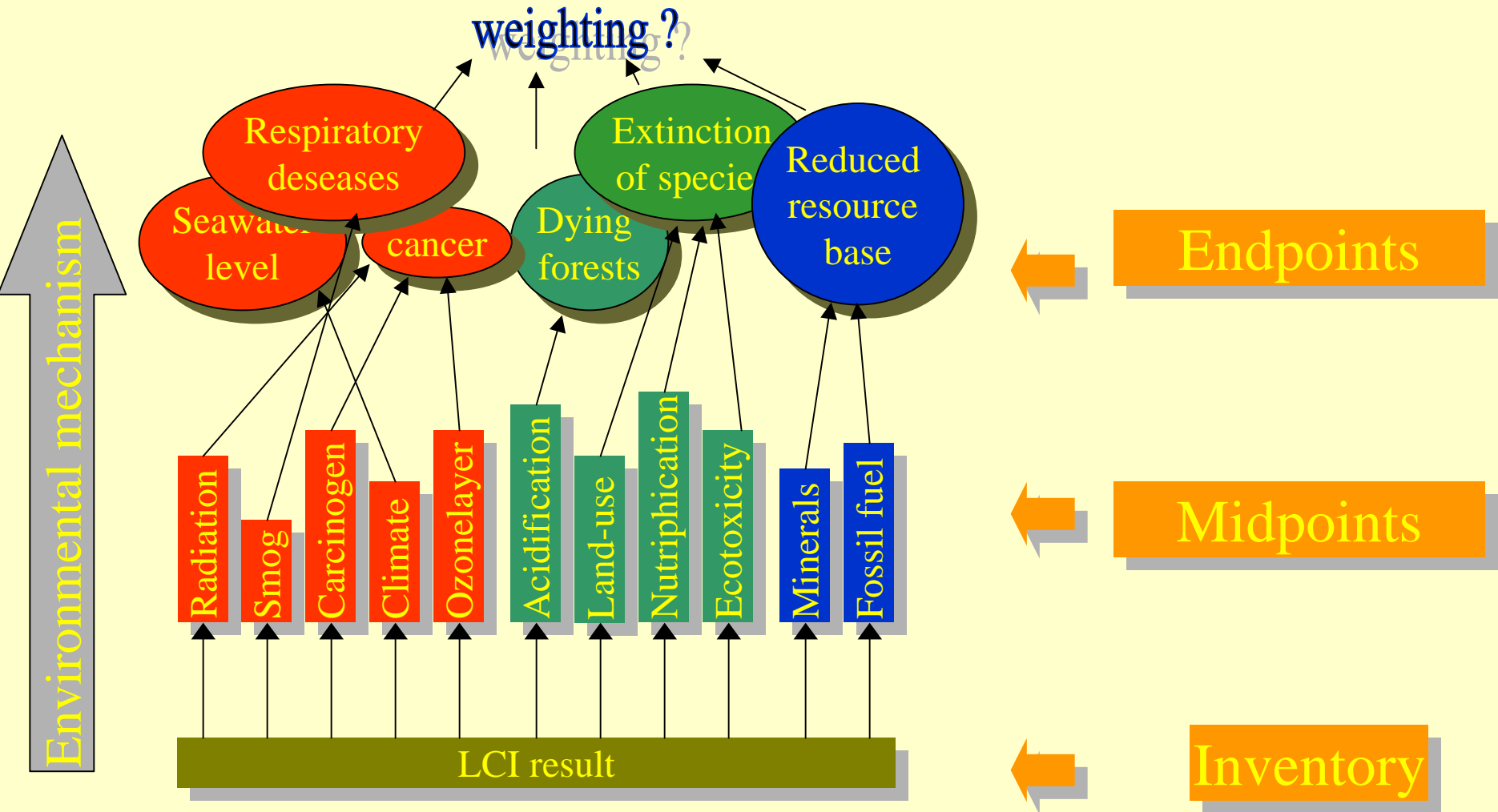
## “Traditional” LCIA

- Category indicators at Midpoint level
- Focus on Characterization models
- Bottom up

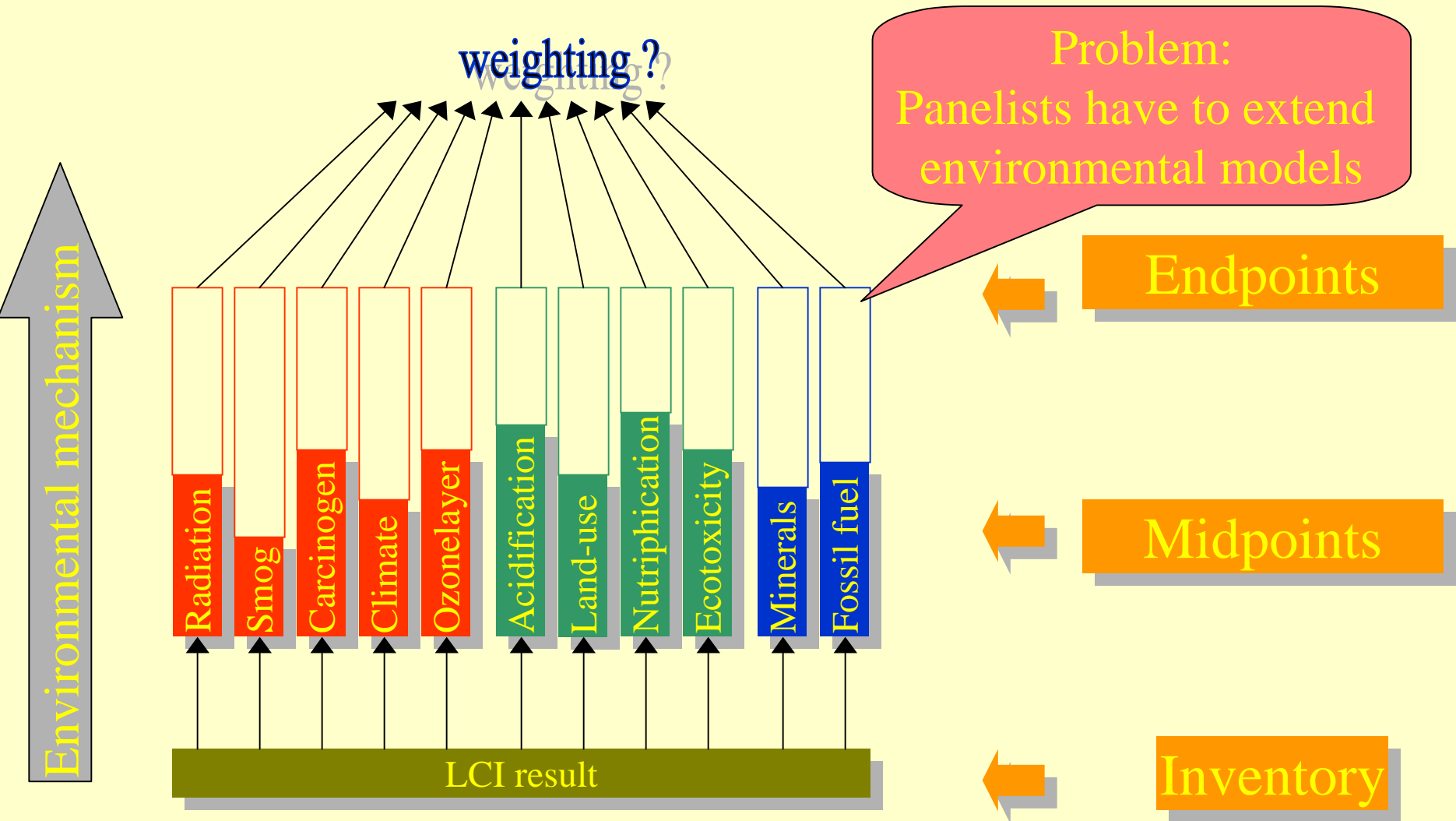
# Endpoints, Midpoints and Relevance



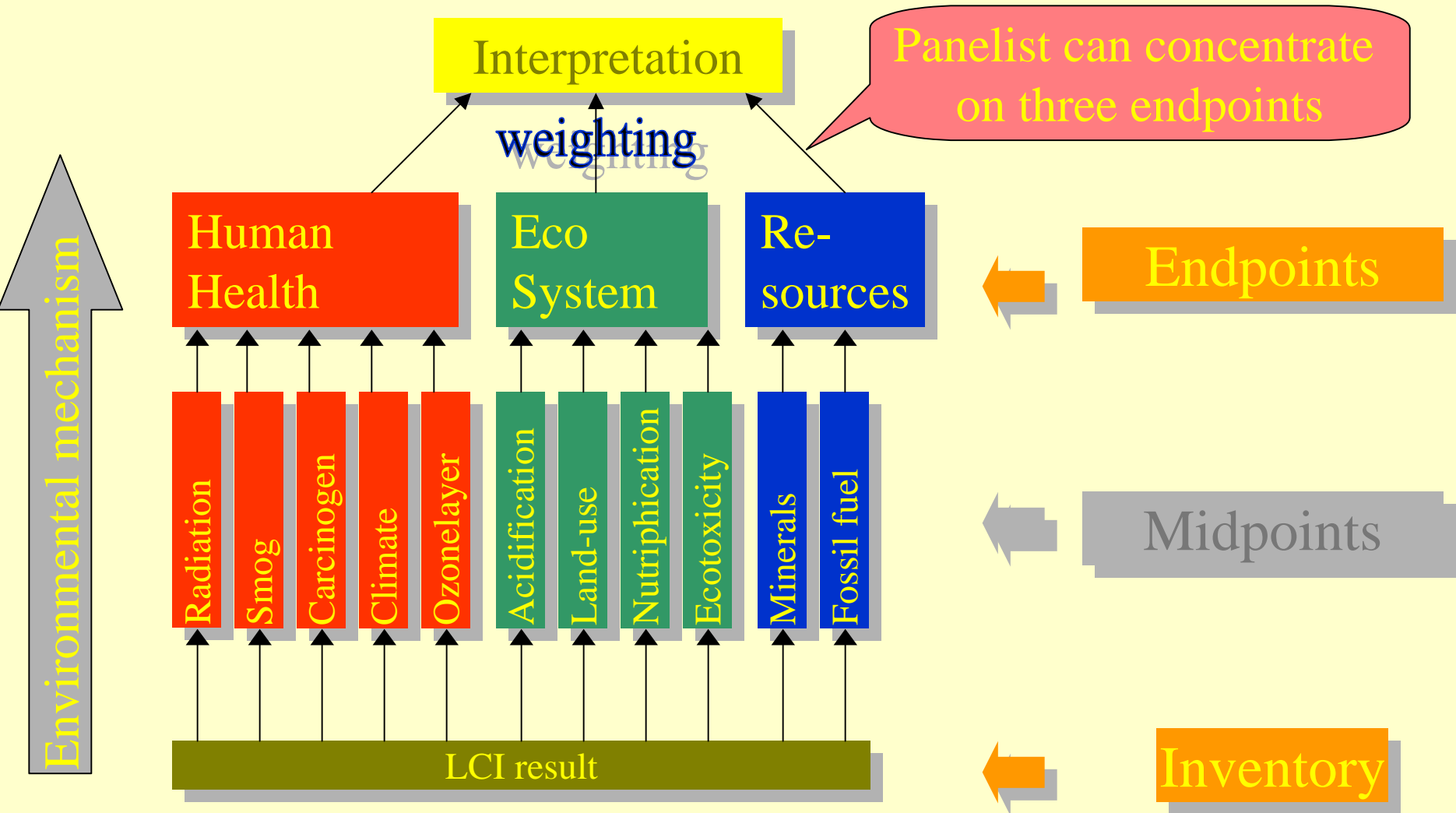
# Weighting?



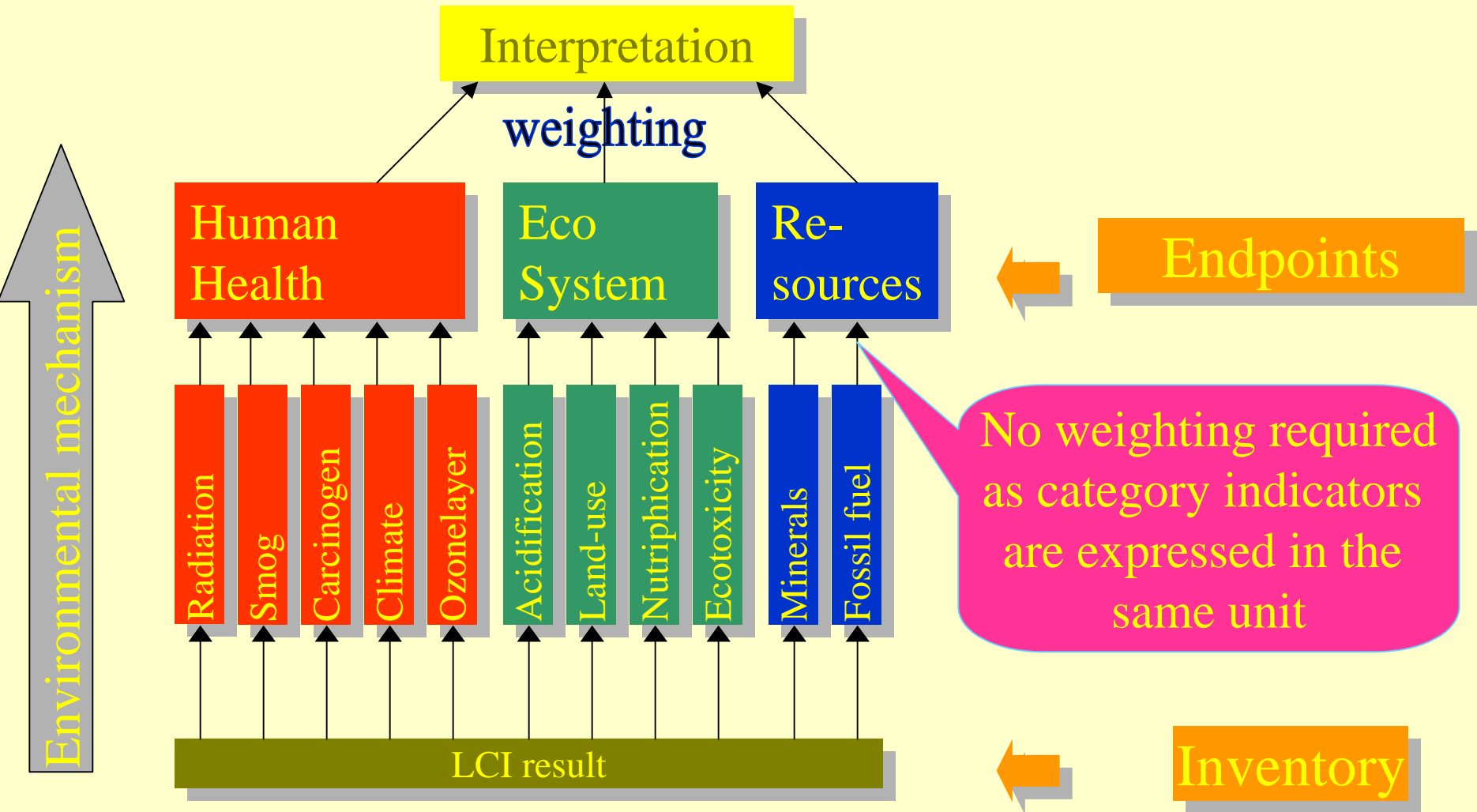
# The problem: weighting Midpoints



# Category indicators at endpoint level



# Easier interpretation and weighting



# Example Human Health

- All category indicators relating to Human Health have the unit DALY (Disability Adjusted Life Years)
- Requires four steps:
  - Fate analysis, exposure analysis, effect analysis, damage analysis
- Requires weighting of disabilities
- Widely in use WHO, Worldbank etc.

# Management of subjective choices

- Some subjective choices are unavoidable
- Three different versions are developed, each with a consistent set of choices

	Time perspective	Manageability	Required level of evidence
H (Hierarchist):	Balance between short and long term	Proper policy can avoid many problems	Inclusion based on consensus
I (Individualist):	Short time	Technology can avoid many problems	Only proven effects
E (Egalitarian):	Very long term	Problems can lead to catastrophe	All possible effects

# Conclusions LCIA

- Endpoint modeling requires more complex environmental models (and possibly greater uncertainties)
- Mid point modeling is simpler, but midpoints are very difficult to interpret
- With Eco-indicator 99 method results can be presented at three levels: 11 indicators, 3 endpoints or a single score

# Part 2: Software tools

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# Part 2 of this presentation

- Part 1: Impact assessment
  - The Eco-indicator 99, benefits of endpoint modeling
  - Different aggregation levels and their application
- Part 2: Software tools
  - Implementation: define goal and scope first
  - Communication: Audiences, users and their requirements;
  - Tools for non LCA experts

# LCA Implementation in a company

- LCA implementation goes through different stages.
- Start with learning by doing
- End with a definition of the exact role of LCA
- Do not start LCA..... Without an implementation plan

# Communication, the critical issue

- Select audiences and define information needs:
  - Management: Supporting strategic choices
  - Designers: Support routine decisions
  - Environmental managers: detailed information
  - Marketing managers: The key issues
- Communicate LCA results on the proper level:
  - Understandable to the audience
  - Clear information on reliability

# LCA implementation plan

Implementation  
plan for of LCA



Goal: Why use LCA ?



Scope:

- Which applications?
- How are results reported, and to who?
- Who will do it

Interface with your organization

# Define applications and audiences

Implementation  
plan for of LCA



Goal: Why use LCA ?



Scope:

- Which applications?
- How are results reported, and to who?
- Who will do it

Interface with your organization



Ecodesign



Strategy  
development



Product  
declarations



Benchmarking  
EMS, process  
improvement



LCC

# Select methods and tools

Implementation  
plan for of LCA



Goal: Why use LCA ?



Scope:

- Which applications?
- How are results reported, and to who?
- Who will do it

Interface with your organization



Ecodesign



Strategy  
development



Product  
declarations



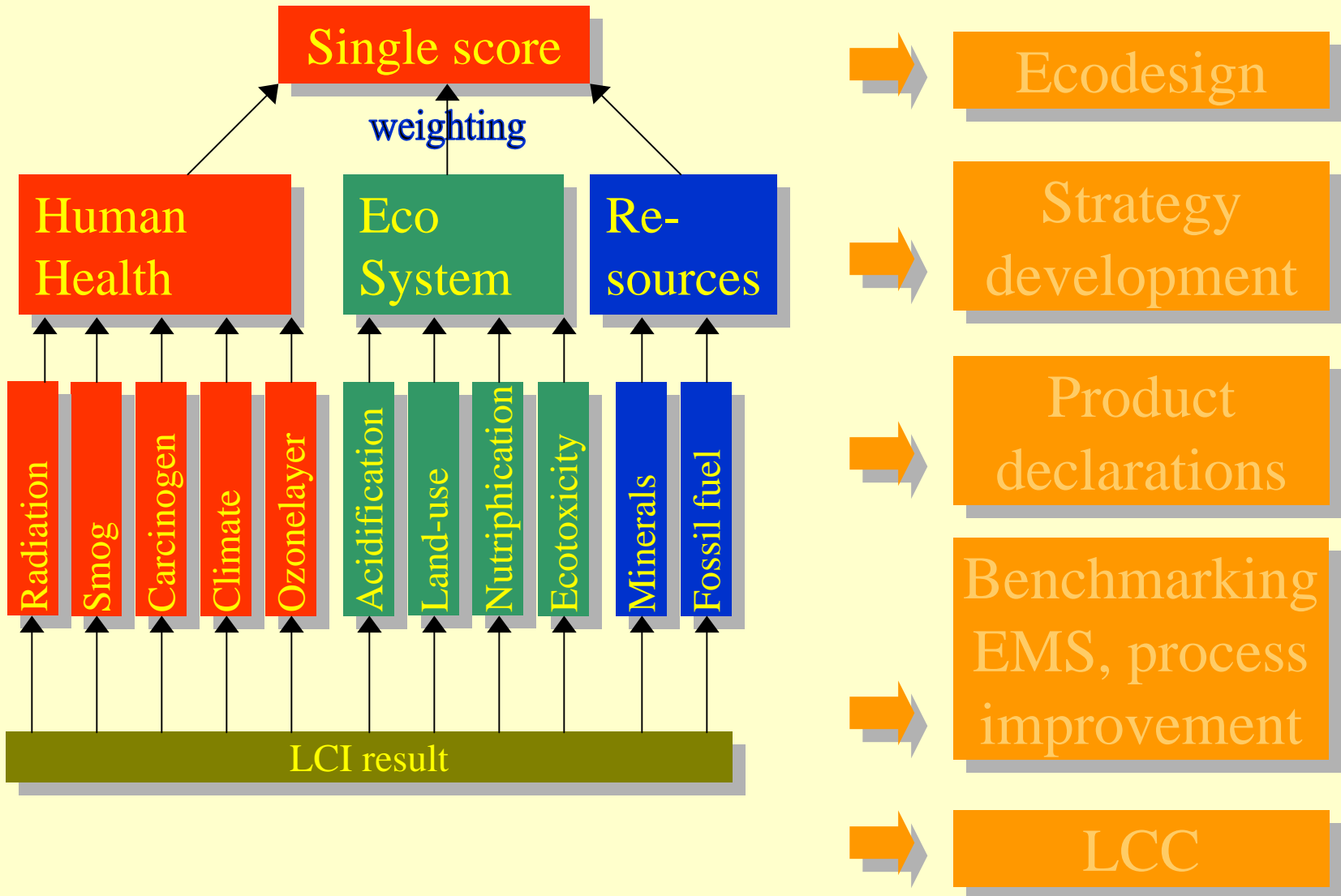
Benchmarking  
EMS, process  
improvement



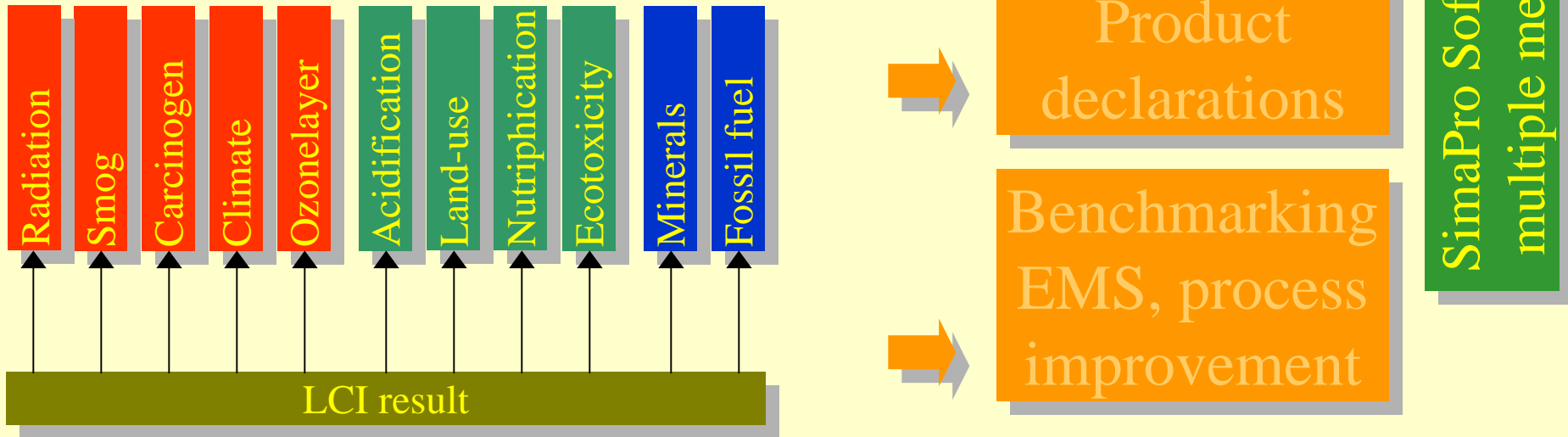
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Select methodology and Software

# Aggregation level and application

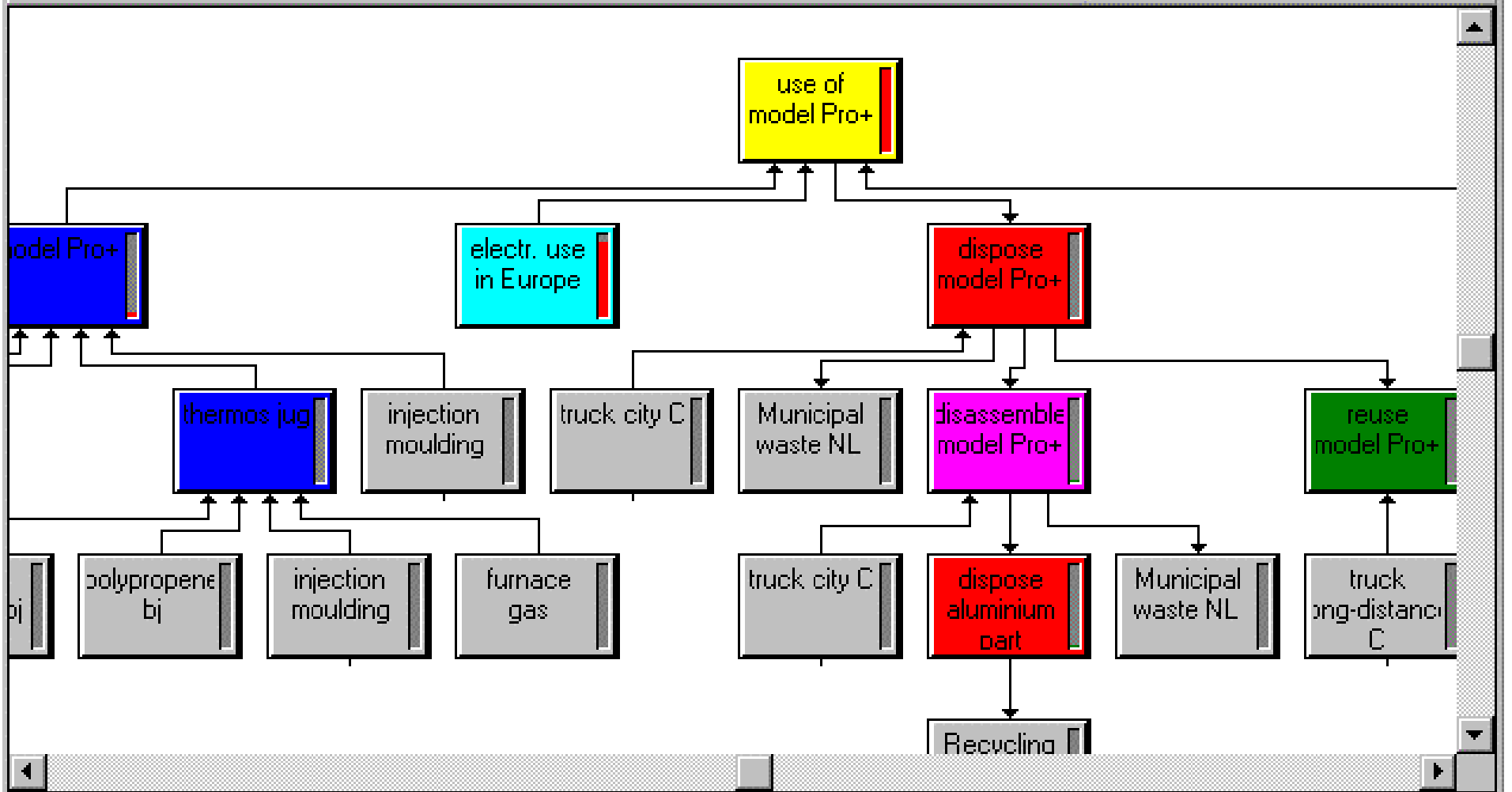


# General LCA applications

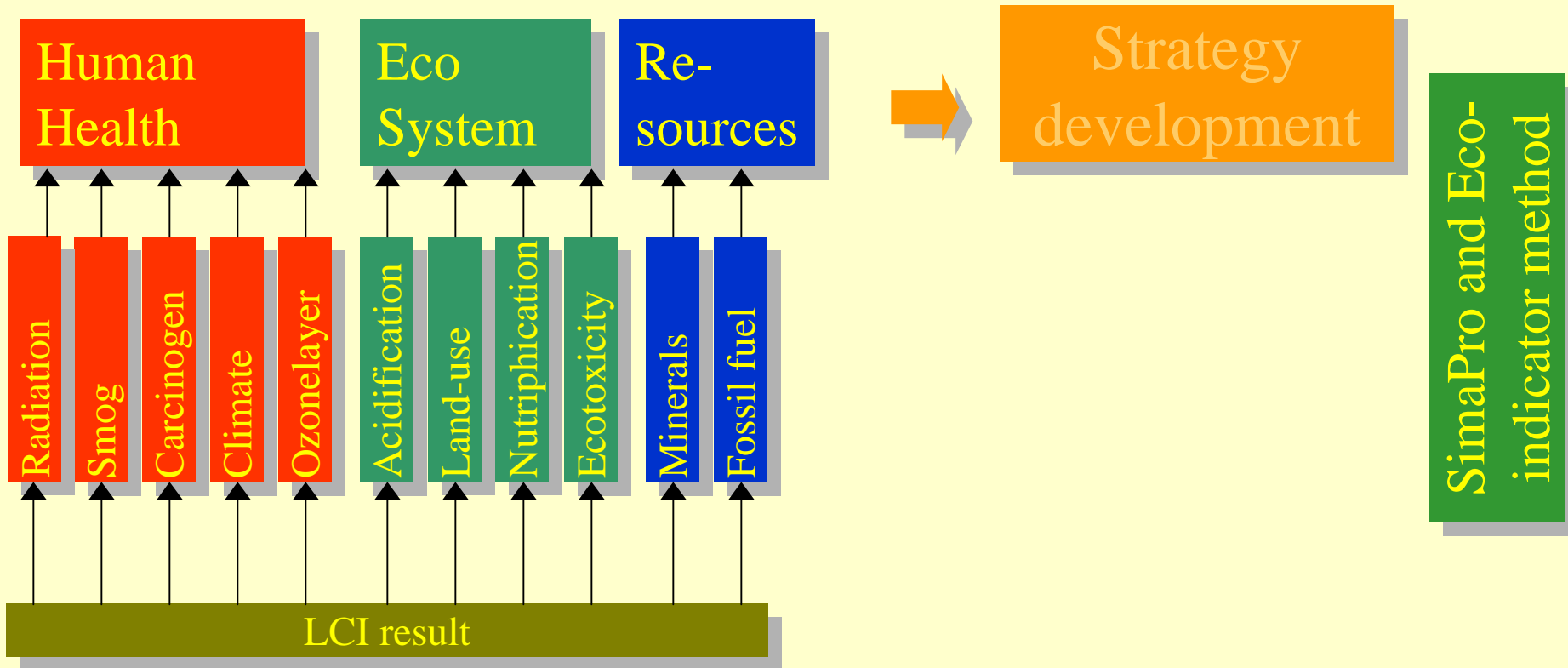




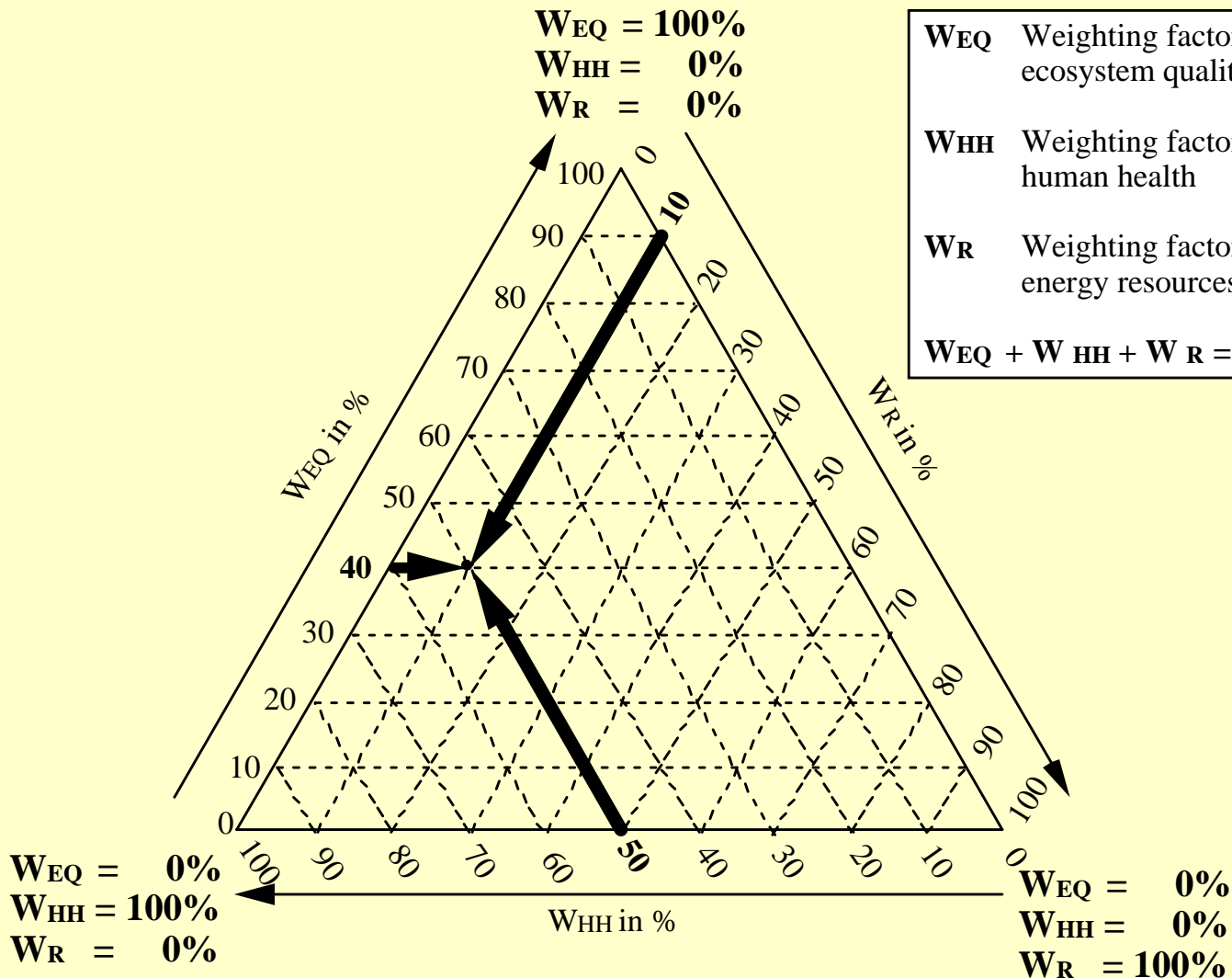
View level Value indicator  Include sub-tree  Exclude sub-tree



# Aggregation level and application



# Triangle



**$W_{EQ}$**  Weighting factor for the damage to ecosystem quality

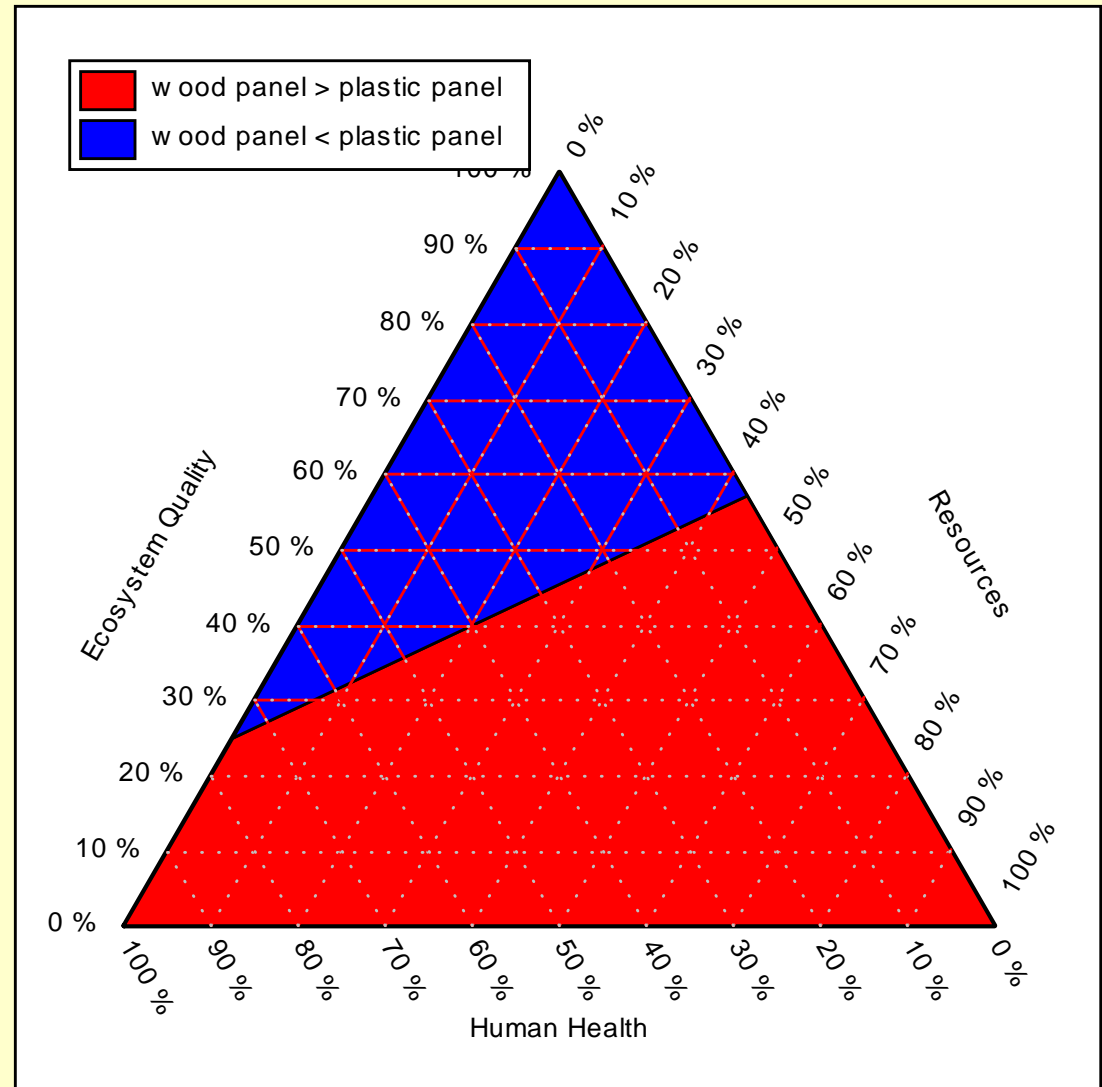
**$W_{HH}$**  Weighting factor for the damage to human health

**$W_R$**  Weighting factor for the damage to energy resources

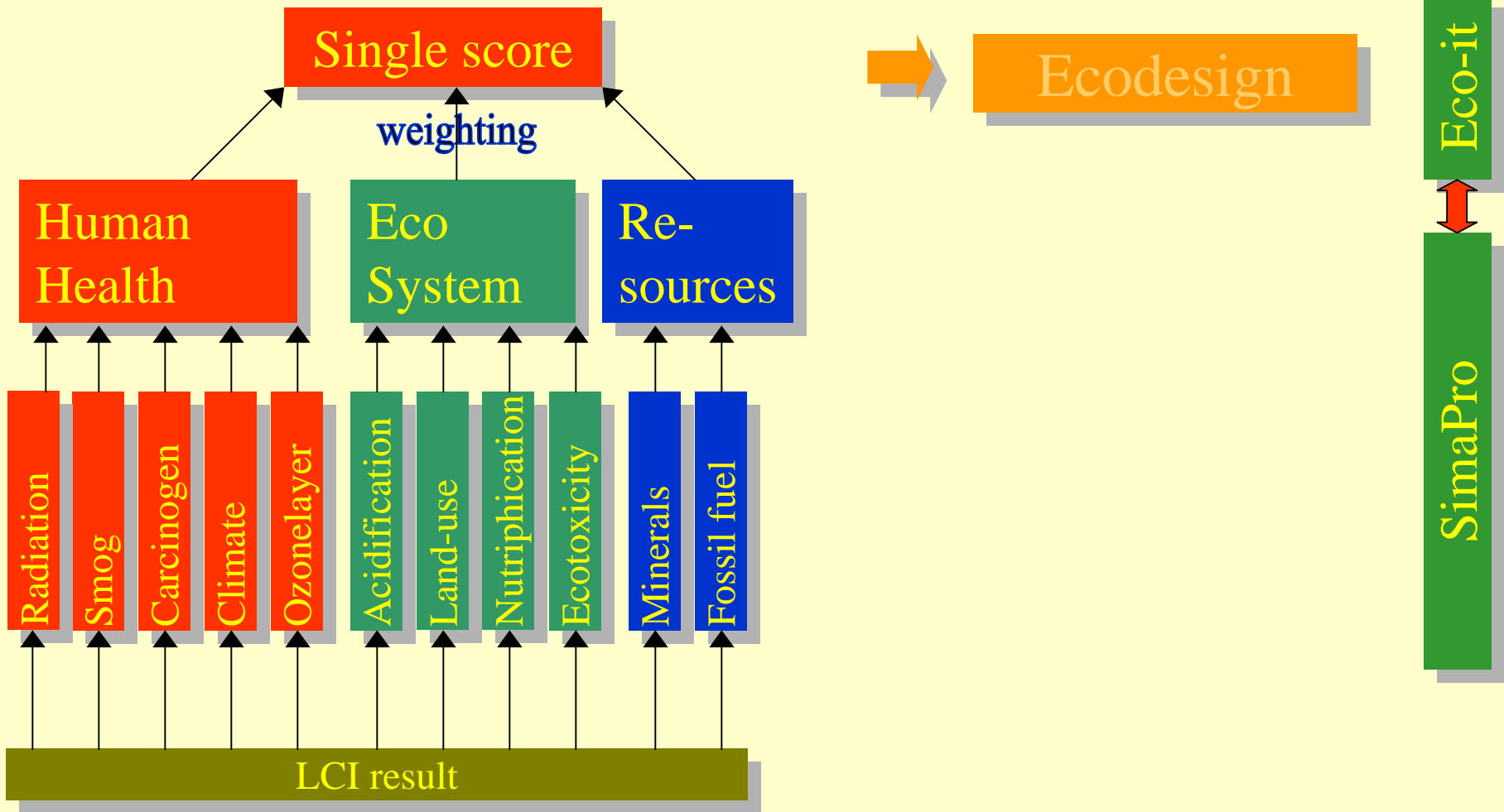
$W_{EQ} + W_{HH} + W_R = 100\%$

# Triangle

- Line of indifference: all weighting sets for which products are equal
- Question: would your weighting set be in red or blue area



# Single scores for designers





## Eco indicator tool: ECO-it

- Simple, low cost tool for designers
- Typically 5 minutes are needed for an LCA
- Contains 200 standard indicators
- SimaPro can be used to calculate additional indicators



Life cycle **Production** Use Disposal

Item	Amount	Unit	Number	Score
Model 'Coffee-it'	1	p	1	[Red bar]
Housing	1	p	1	[Red bar]
PS, High Impact (HIPS)	1	kg	1	[Red bar]
Injection Moulding	1	kg	1	[Red bar]
Glass jug	1	p	1	[Red bar]
Glass	0,4	kg	1	[Red bar]
Heat from gas	4	MJ	1	[Red bar]
Aluminium riser pipe	1	p	1	[Red bar]
Aluminium	100	-	1	[Red bar]
Extrusion				
Hot plate				
Steel, sheet				

- [-] Model 'Coffee-it'
  - [-] Housing
    - [Pencil] PS, High Impact (HIPS)
    - [Mould] Injection Moulding
  - [-] Glass jug
    - [Pencil] Glass
    - [Mould] Heat from gas
  - [-] Aluminium riser pipe
    - [Pencil] Aluminium
    - [Mould] Extrusion
  - [-] Hot plate
    - [Pencil] Steel, sheet

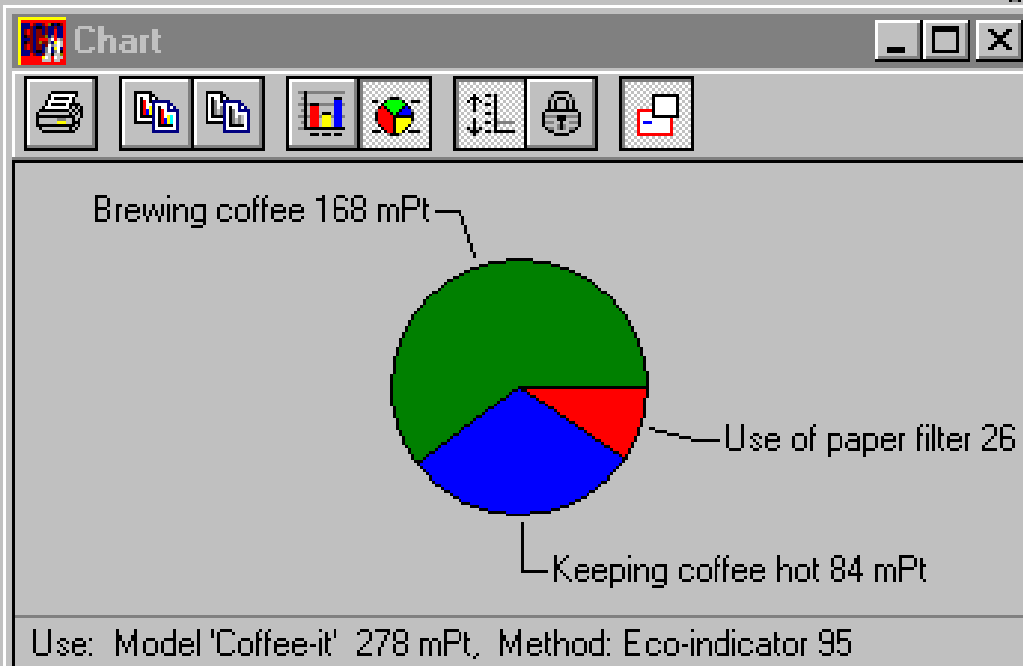
**Database processes** [X]

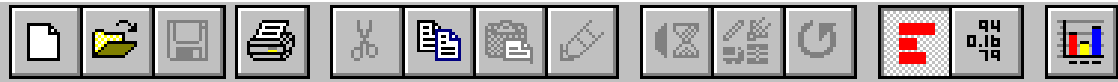
Category	Sub-category	Name	Unit	mPt
Materials	Metals	Aluminium	kg	18
Energy	Others	Aluminium, secondary	kg	1,8
Transport	Plastics	Copper, 60% primary	kg	60
Processing	Rubbers & elastome	Copper, primary	kg	85
		Copper, secondary	kg	23
		Steel	kg	4,1
		Steel, secondary	kg	1,3
		Steel, sheet	kg	4,3
		Steel, stainless	kg	17

Comment containing an average of 20% recycled material source: B

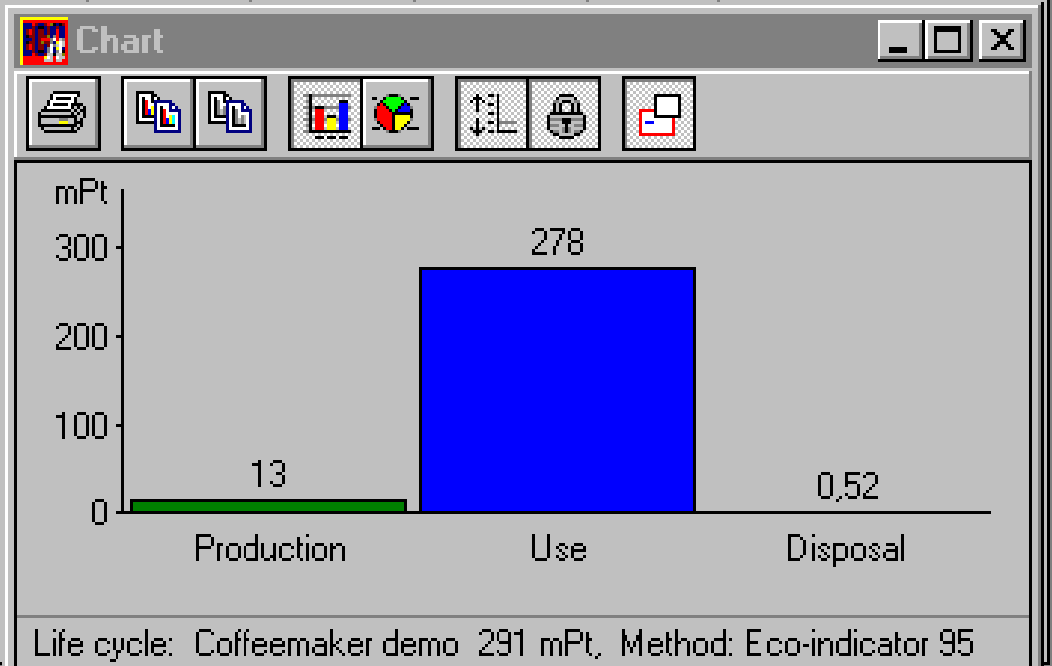


Life cycle	Production	Use	Disposal
Item	Amount Unit	Number	Score
[-] ● Model 'Coffee-it'	1 p	1	[Red bar]
[-] ⌚ Brewing coffee	1 p	1	[Red bar]
[-] ⚡ Electricity Low	250 kWh	1	[Red bar]
[-] ⌚ Keeping coffee hot	1 p	1	[Red bar]
[-] ⚡ Electricity Low	125 kWh	1	[Red bar]
[-] ↻ Use of paper filter	3650 x	1	[Red bar]

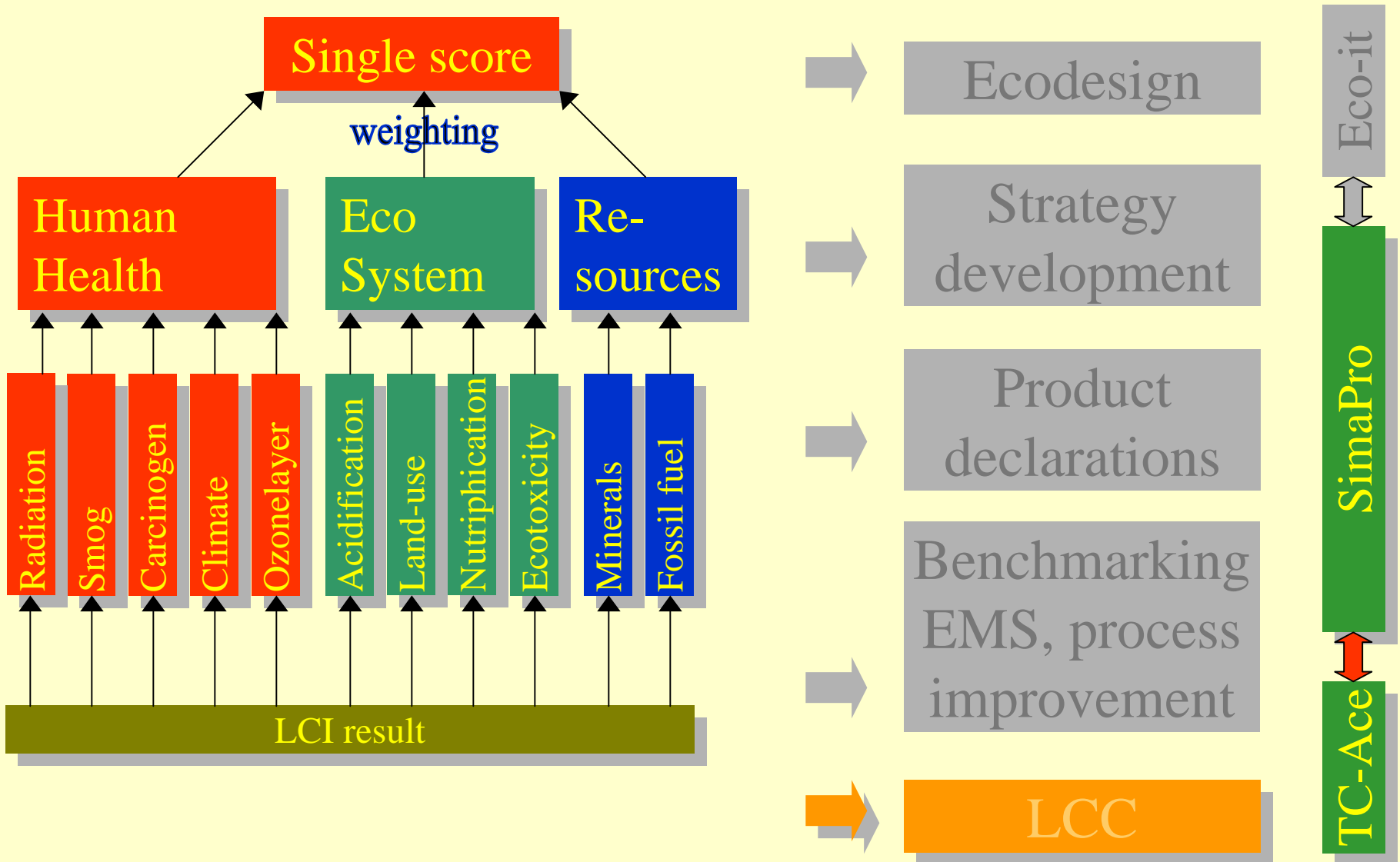




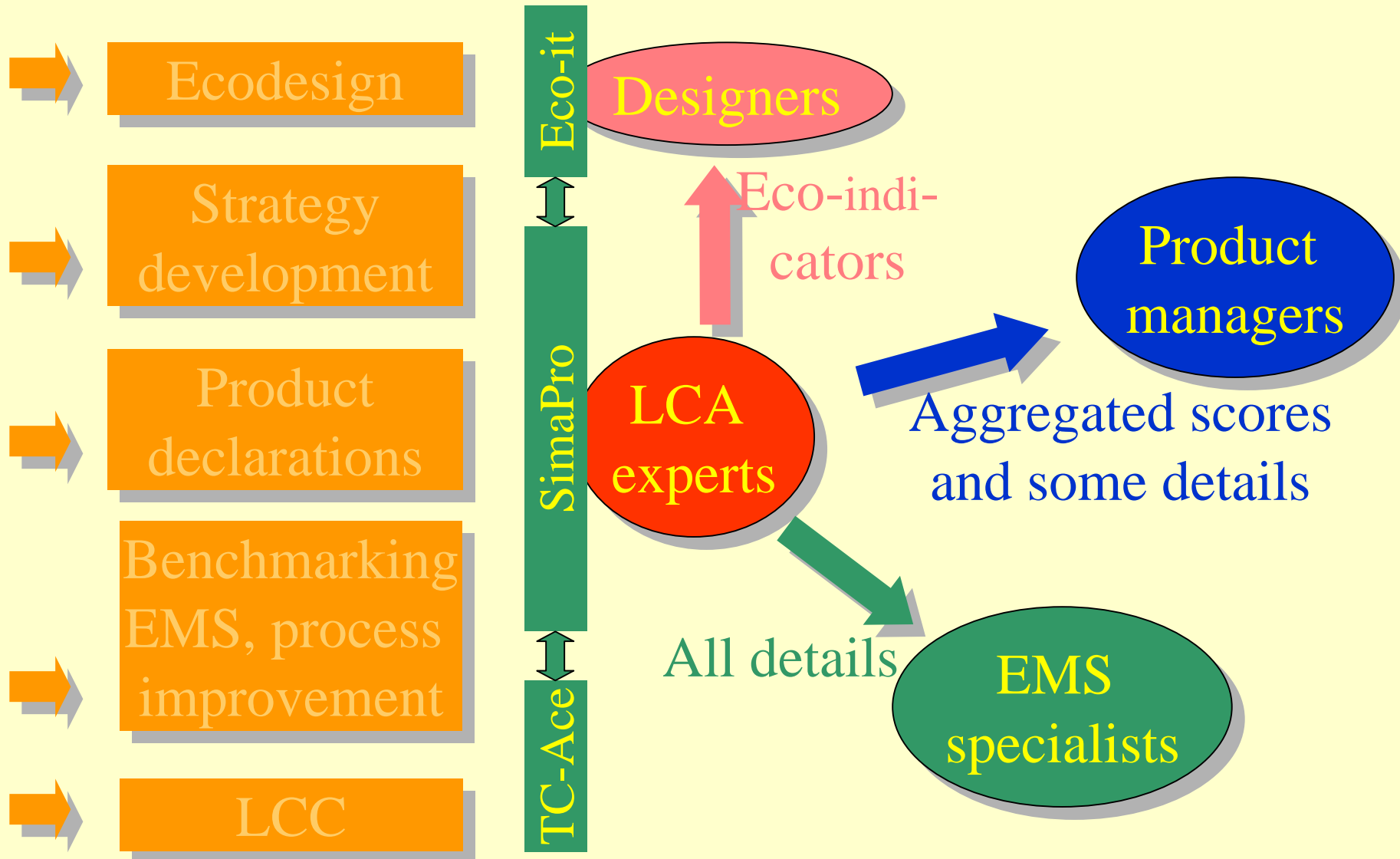
Life cycle	Production		Use			Disposal
Item	Municipal	Household	Recycling	Incineration	Landfill	Score
<b>Model 'Coffee-it'</b>	100 %	0 %	0 %	0 %	0 %	
Housing	100 %	0 %	0 %	0 %	0 %	
PS, High Impact (HIPS)	100 %	0 %	0 %	0 %	0 %	
Glass jug	50 %	0 %	50 %	0 %	0 %	
Glass	50 %	0 %	50 %	0 %	0 %	
Aluminium riser pipe	100 %	0 %	0 %	0 %	0 %	
Aluminium	100 %	0 %	0 %	0 %	0 %	
Hot plate	100 %	0 %	0 %	0 %	0 %	
Steel, sheet	100 %	0 %	0 %	0 %	0 %	



# Life-cycle costing (coming soon)



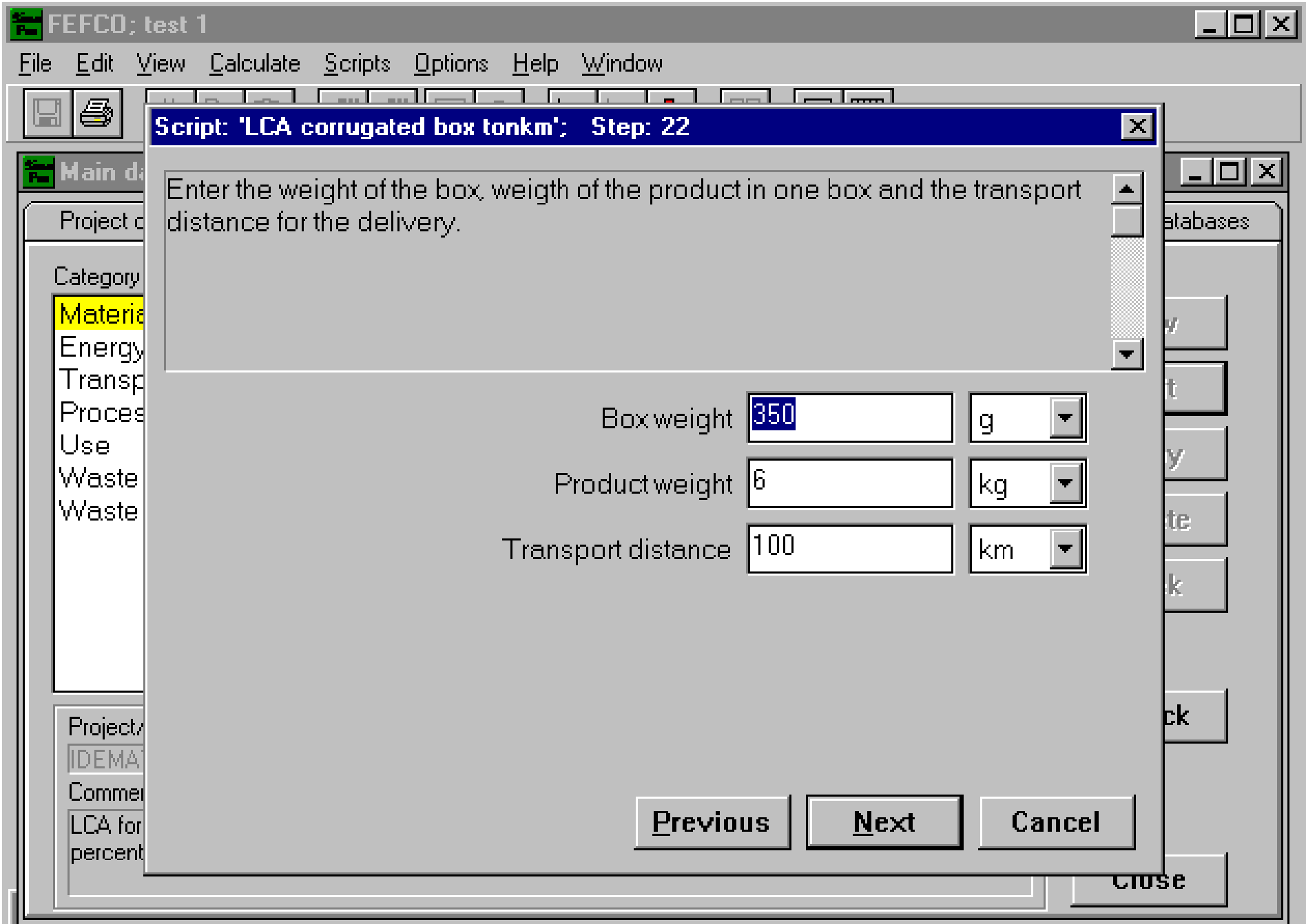
# Audiences and information flows



# Transparency for non experts

- Eco-indicators software is black box
- Full LCA software is too complex for non experts

Our solution: LCA SCRIPTS.  
Works with predefined questions  
Easy to use, yet fully transparent

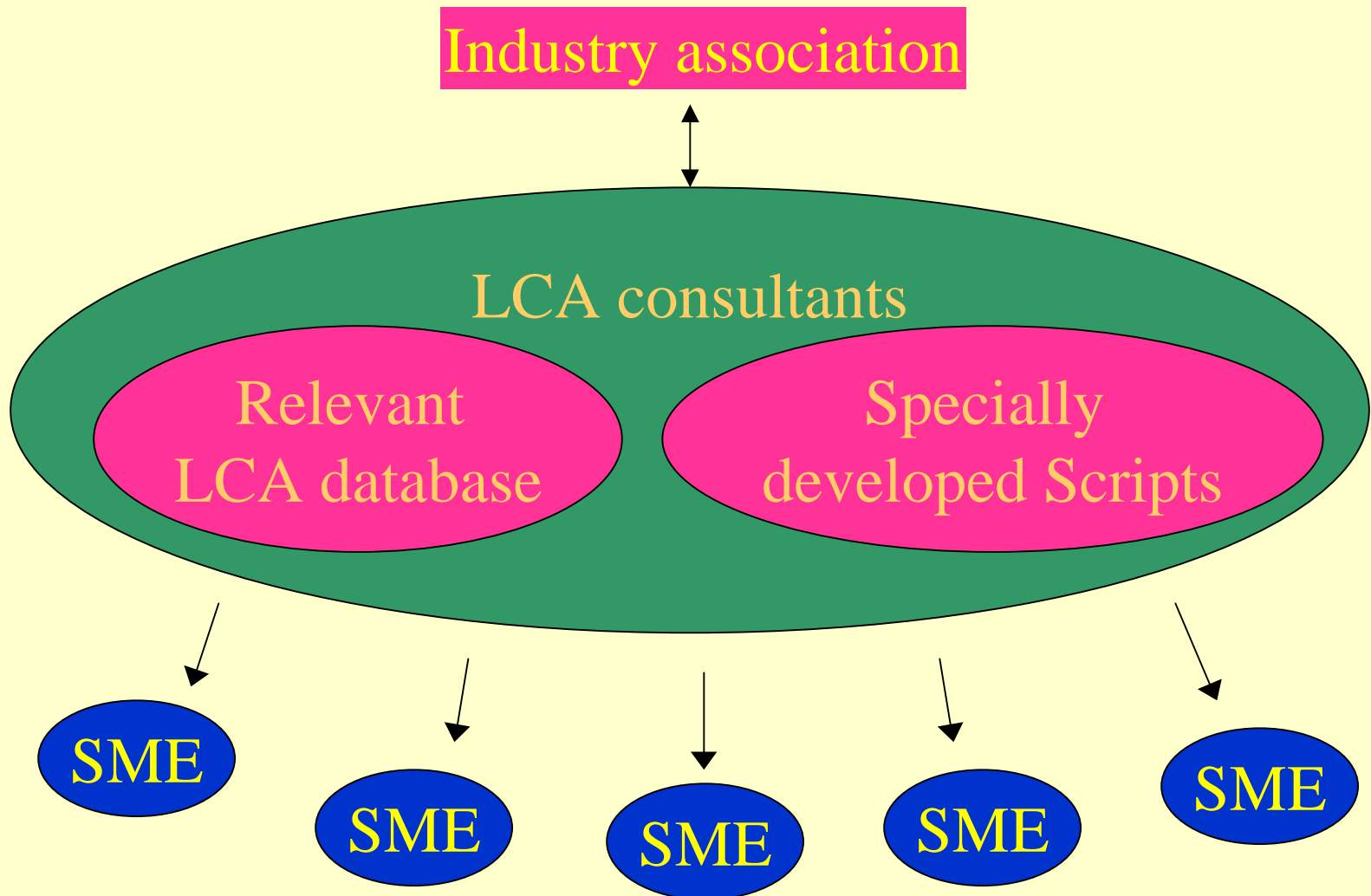


Example of a Script screen

# Scripts: the transparent solution

- People want to have access to the full LCA data, and they want to analyse the results
- But....full featured LCA software is too complex for non experts
- Scripts can be programmed by experts, to facilitate the application of the data by non experts.
- Completely transparent results

# Script project structure



# Scripts for SME's

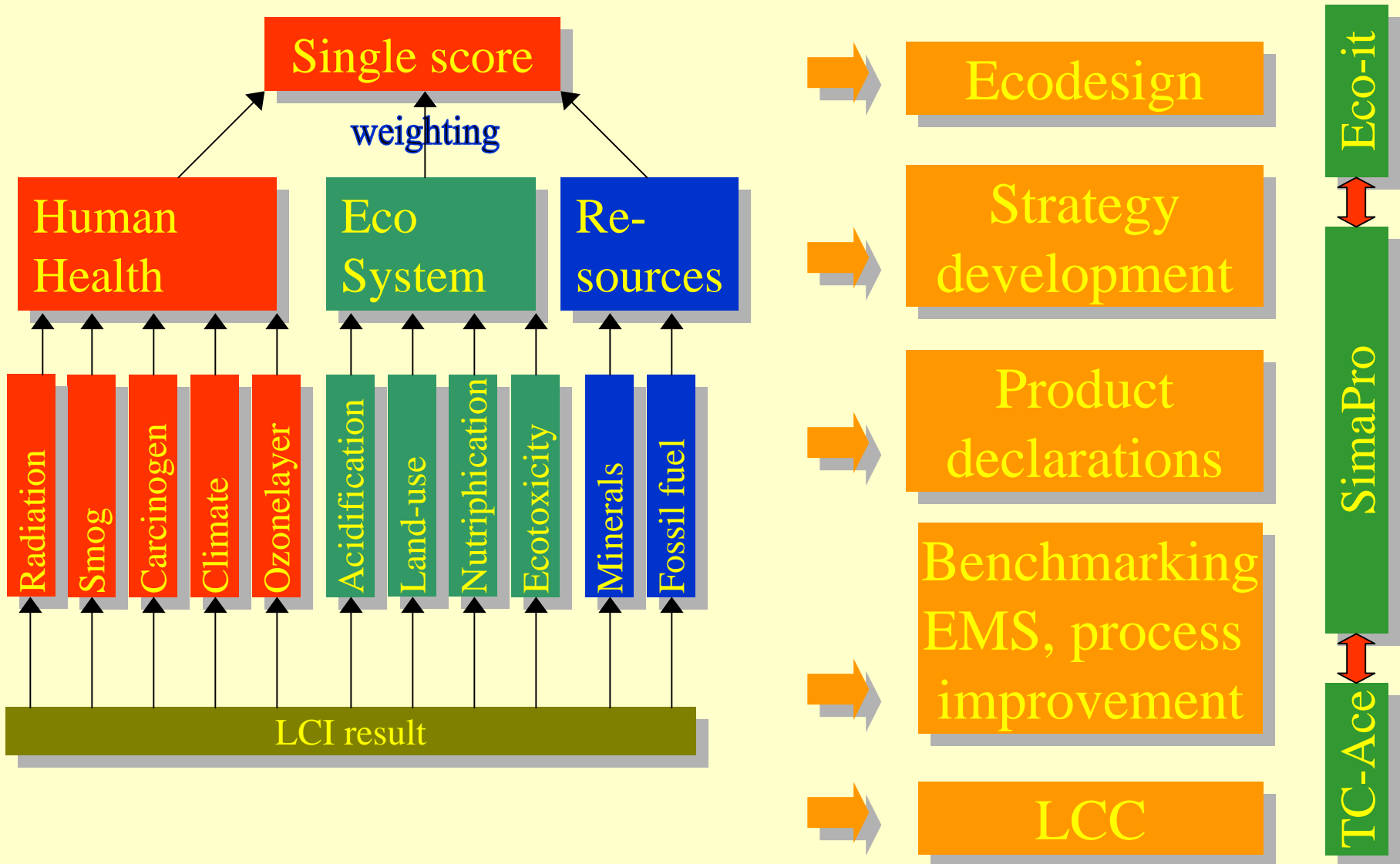
- SME's need to communicate LCA results to large clients
- SME's cannot afford an LCA expert
- SME's can use scripts and special databases
- Collaboration is needed to develop database and scripts
- EC sponsored project "TIE" will further develop this concept

# Conclusions LCA implementation

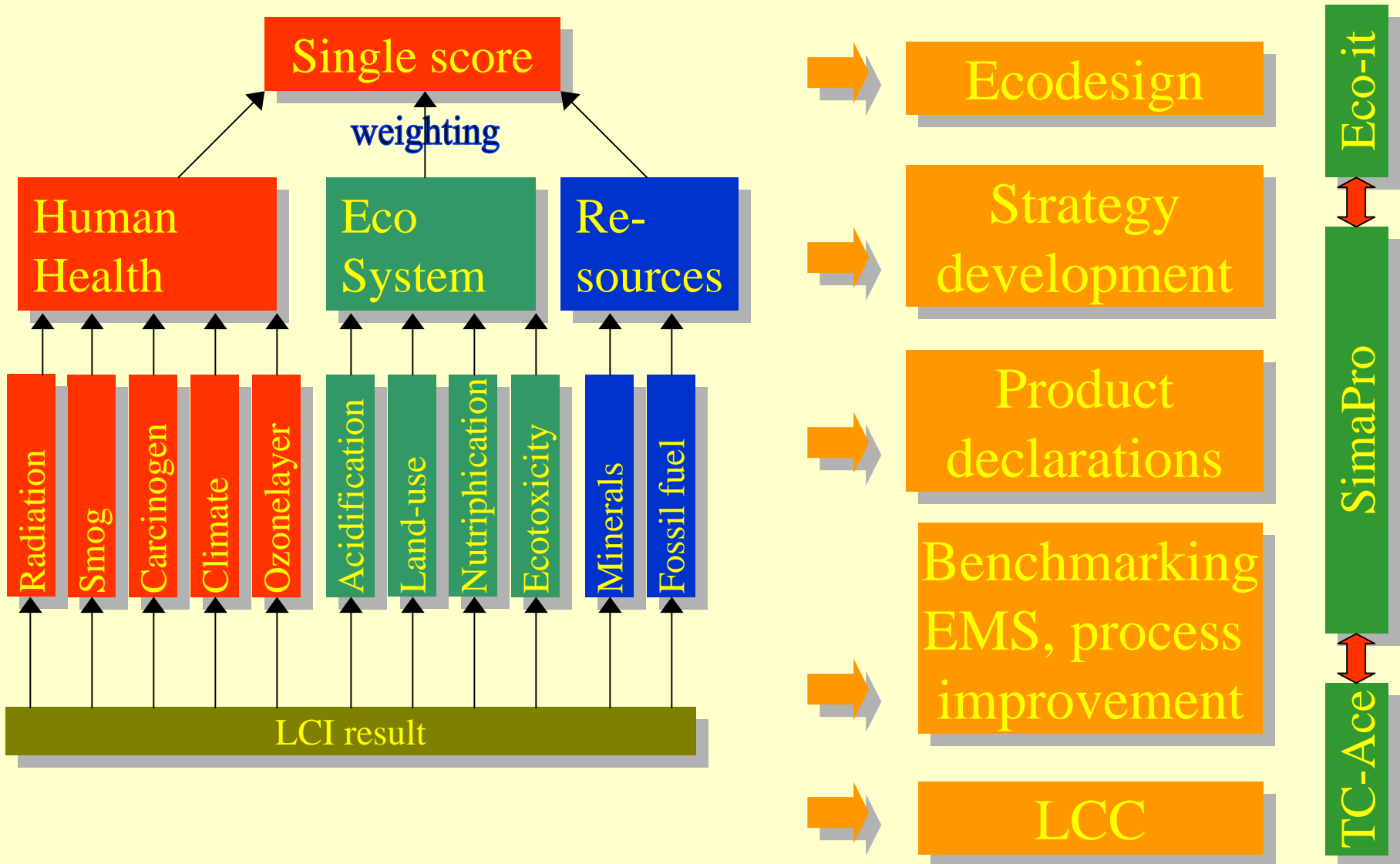
- LCA implementation requires careful analysis of information needs and structure
- A range of tools is needed to address different needs:
  - LCA practitioners: (multi user) LCA software and LCC module
  - Designers: simple fast tool (black box)
  - Other non experts: Scripts that guide the user



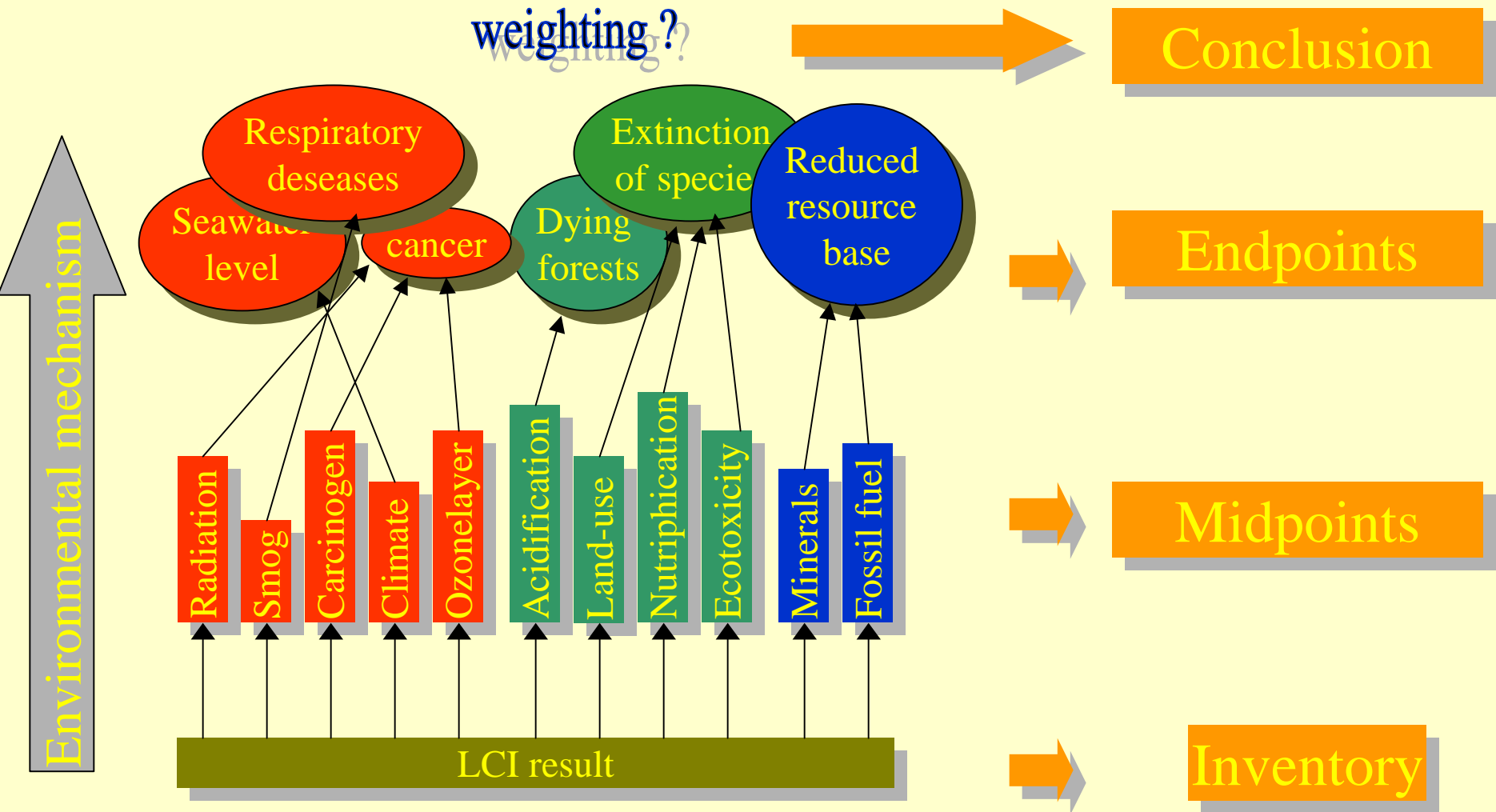
# Aggregation level and application



# Aggregation level and application



# Endpoints, Midpoints and Weighting



# Aggregation level and application

