



UCD Institute of Food & Health

Is “Food Waste” waste?

Nicholas M. Holden

School of Biosystems Engineering

University College Dublin

Agriculture and Food Science Centre

Belfield, Dublin 4, Ireland

What is waste?

EU Waste Directive 2008/98/EC definition:

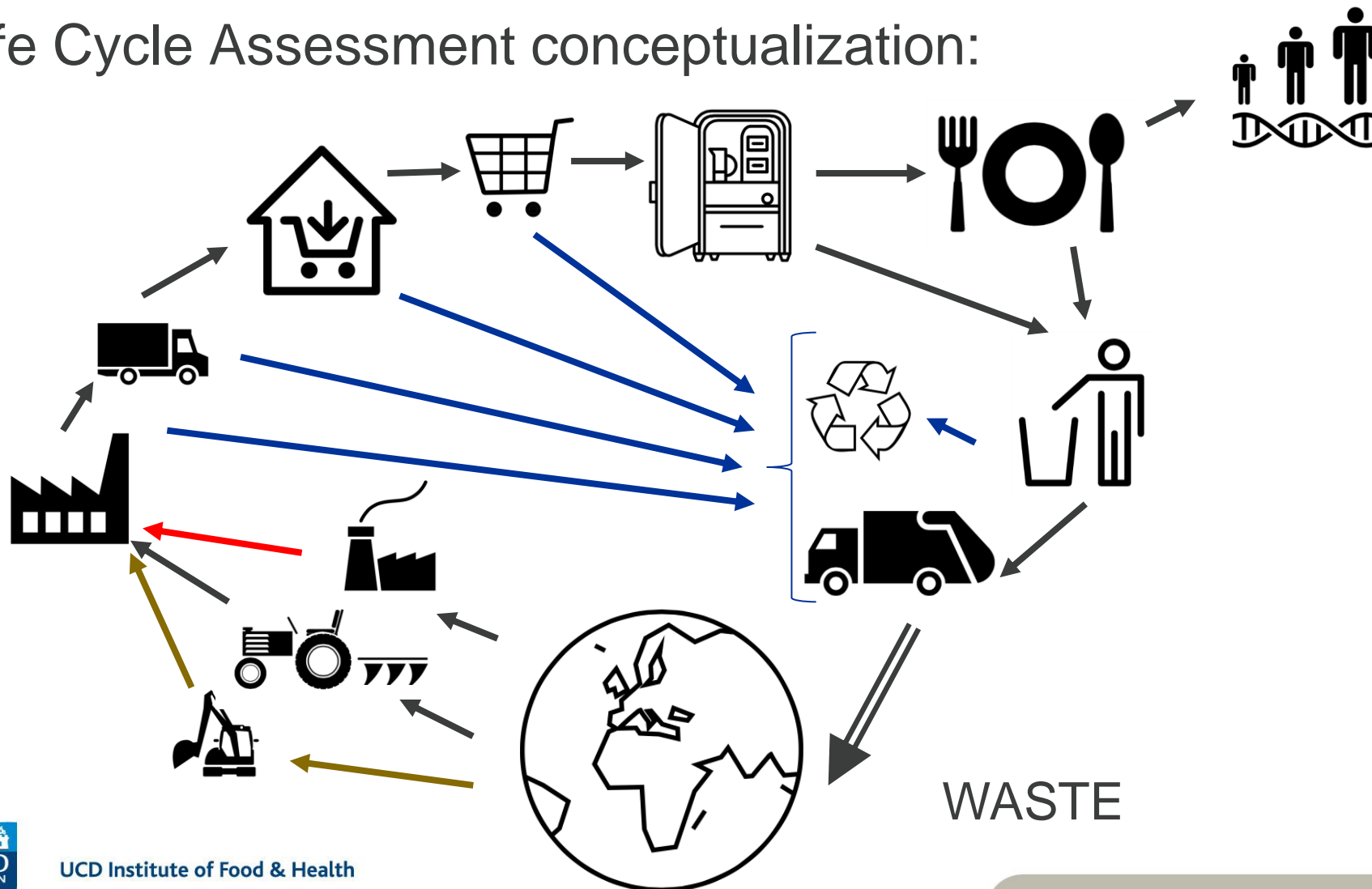
“items that people no longer have any use for, which they either intend to get rid of or have already discarded”

- Subjective
- Inconsistent
- Variable state and status
- Ambiguous
- Actors dependent



What is waste?

Life Cycle Assessment conceptualization:



What is waste?

LCA conceptualization:

- Input flows drawn from biosphere
- **Output flows are wastes that are discarded to the biosphere without subsequent human transformation [ISO14040 (2006)]**
- If we limit our idea of “waste” to these output flow is the concept then
 - Unambiguous
 - Objective
 - Actor independent?



Why do we care about the definition?

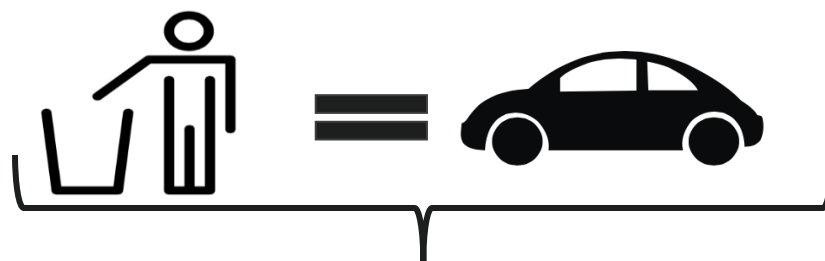
- Food waste is important



35% ↓

=

↓ 50%



1 kg = 2.8 kg CO₂ = 21 km

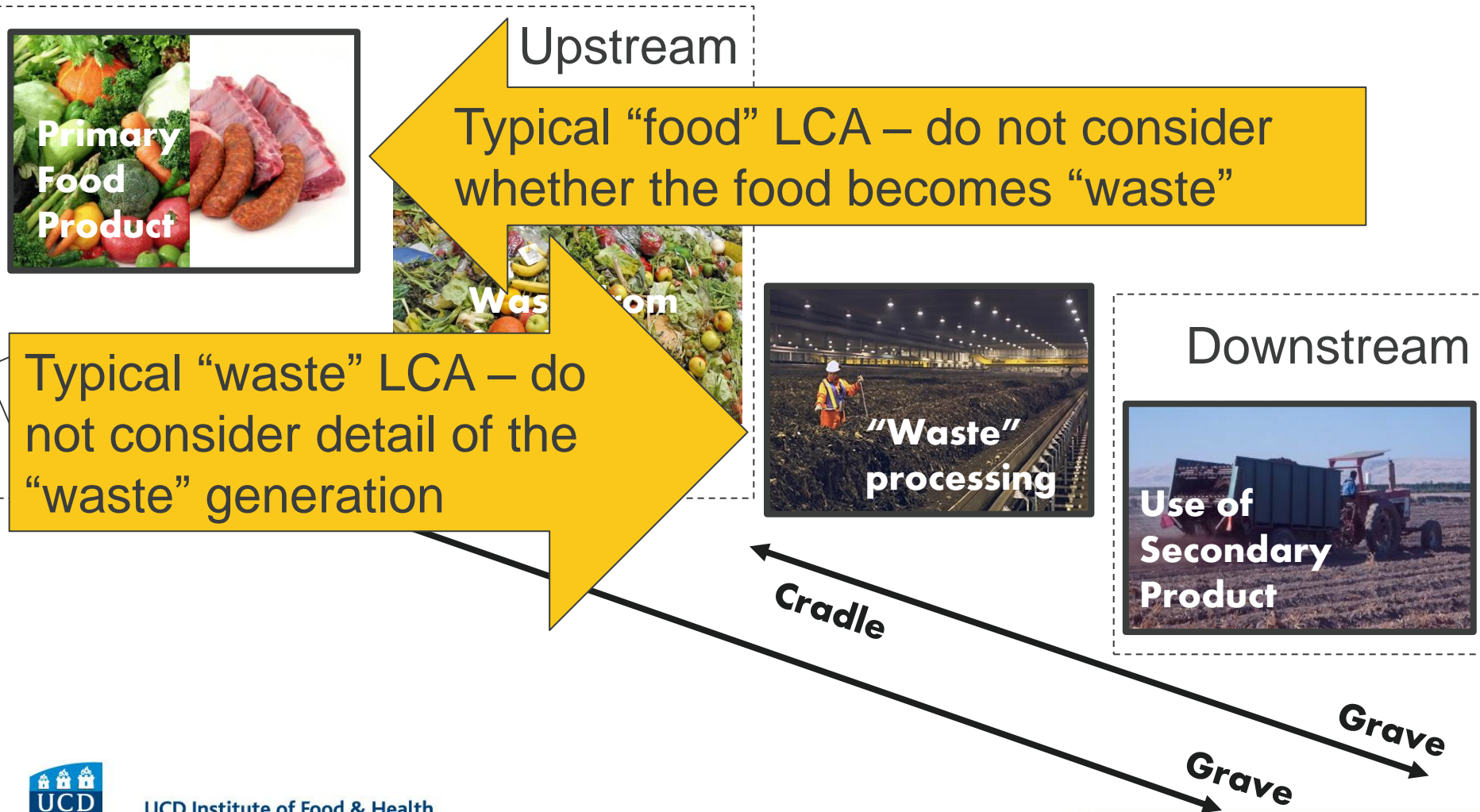


Does a subjective definition of waste help reduce waste?

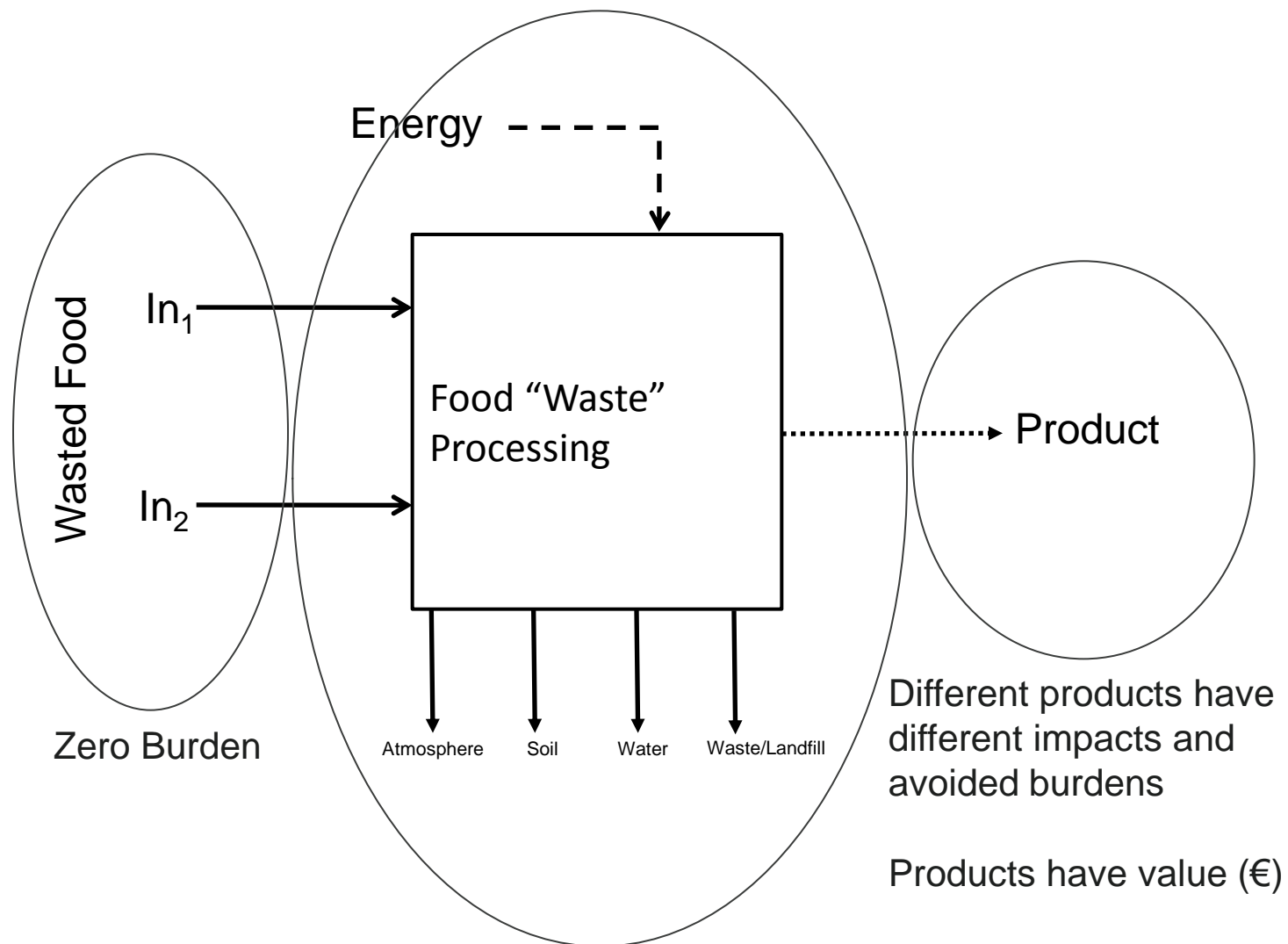
Why do we care about the definition?

- Material that is a resource is treated differently
 - Carbon containing waste is now a “resource” for some actors
 - UK government report recommends ministerial responsibility for “waste as a resource” in the bioeconomy
 - Waste hierarchy
 - Prevent } Why do this if waste is a resource?
 - Reduce }
 - Reuse } If this is my business surely I want
 - Recover } reliable supplies of raw materials?
 - Dispose }

The upstream concept in waste LCA



Zero burden assumption for “waste” LCA

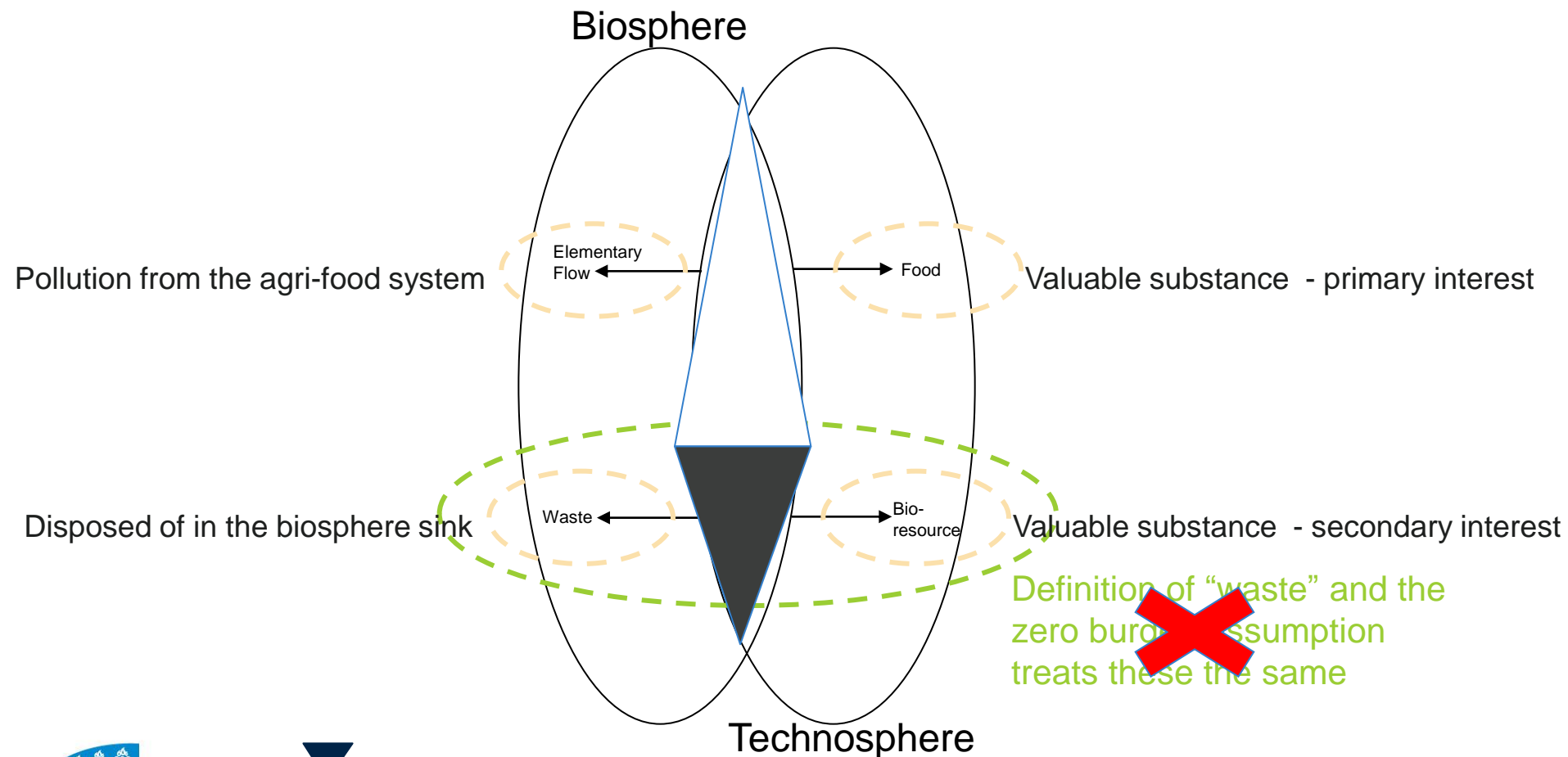


Zero burden assumption for “waste” LCA?

- Lit review shows ZBA used in nearly all food waste LCA studies published recently
- Food waste always assumed to have no impact when making technology assessments
- Food waste is known to be heterogeneous and its composition can be quite unpredictable
- We know there is economic value (via tax, disposal payment, financing, sale of downstream products)
- Many mass flows are only waste in the subjective opinion of the actor, and remain a resources in the system
- No longer clear what the function of the system is...



Is “food waste” waste?



Value (€/t or €/m³)

3. Low Mass and High Value

Secondary... because
out...
increas...
dema...
greater ma... 4.

Bioresource

4. High Mass and High Value

Should not be considered waste.
As cr...
ma... of
th... system
upstre... create
the valuable substance.
Indicative sub-system
optimization? The Incentive to
reduce is low

Co-product

1. Low Mass and Low Value

Arises because there is either little
waste produced or system has
been... waste.
Low va...
res...
value...
available...
worthwhile. ...
be forced to class 3. The
incentive to reduce is high.

Food Waste

2. High Mass and Low Value

Arises because system inherently
produces... no real
pos...
use for... class
4 rather than class 1.

Wasted food

Mass (or volume)



Proposed terminology for “food waste”

- **“Waste(a)”** – used strictly to describe those materials that are not utilizable and are disposed of in the biosphere sink – *prevent to minimum possible and dispose*
- **“Residue”** – materials that are unavoidable but not consumable. Can be regarded as a bioresource – *prepare for reuse, recycle, compost or energy recovery*
- **“Wasted food/product”** – material that has been mismanaged and should never end up in secondary processing – *prevent to a practical minimum, then prepare for reuse, recycle, compost or energy recovery*



Conclusions

- We need to start avoiding using the word “waste” in a subjective, ambiguous manner
 - Actor independent definition
 - Stable meaning

} ‘my waste means same as your waste’
- “Food waste” is not always “waste”
- The best policy and management solutions for food waste require more strict use of the terminology and due consideration of the role of bioeconomy in primary and secondary resource markets





Welcome to the Icafood2016
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10th International Life Cycle Assessment of Food Cycles 2016
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Smart science, good food

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Thomas Oldfield

Eoin White
Wenhao Chen
Pooja Sharma
Paul Rice
Rui Liu
Mingjia Yan