

---

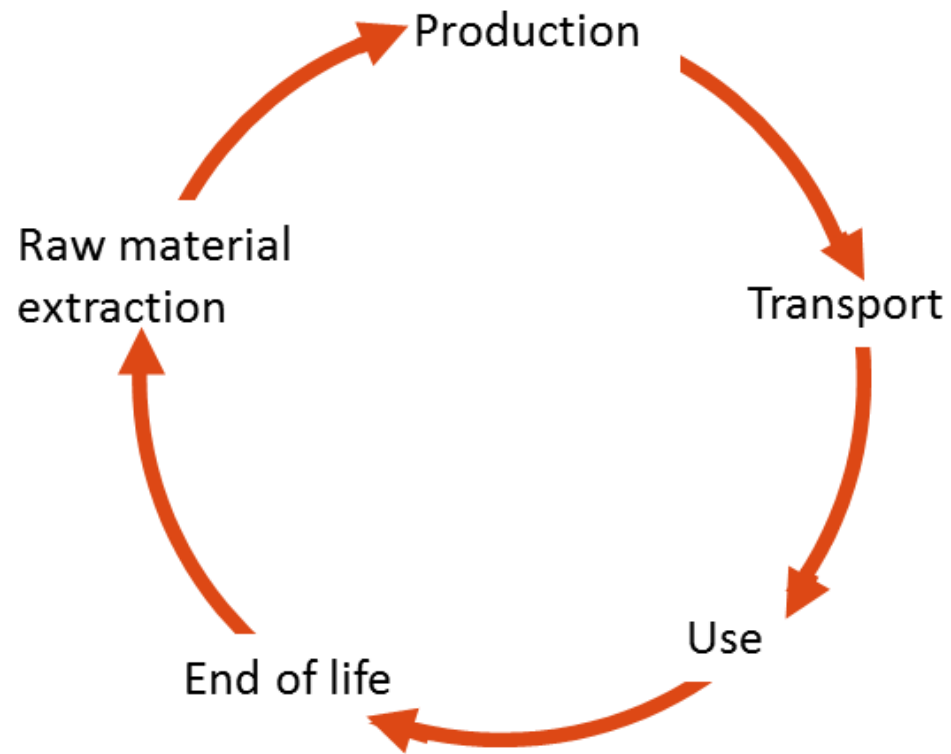
# Environmental impact of glucose: influence of the datasets on LCA results

---

Saïcha Gerbinet, Sandra Belboom and Angélique Léonard  
saïcha.gerbinet@ulg.ac.be  
Products, Environment, and Processes (PEPs)  
Department of Chemical Engineering  
Université de Liège  
[www.chimapp.ulg.ac.be](http://www.chimapp.ulg.ac.be)



# LCA?



# Glucose?

- It is a simple aldohexose monosaccharide and only three of them can be directly absorbed into the bloodstream during digestion ...

# Glucose?

Agriculture

Starch  
extraction

Hydrolysis

Corn



Wet process



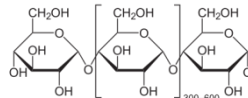
Hydrolysis



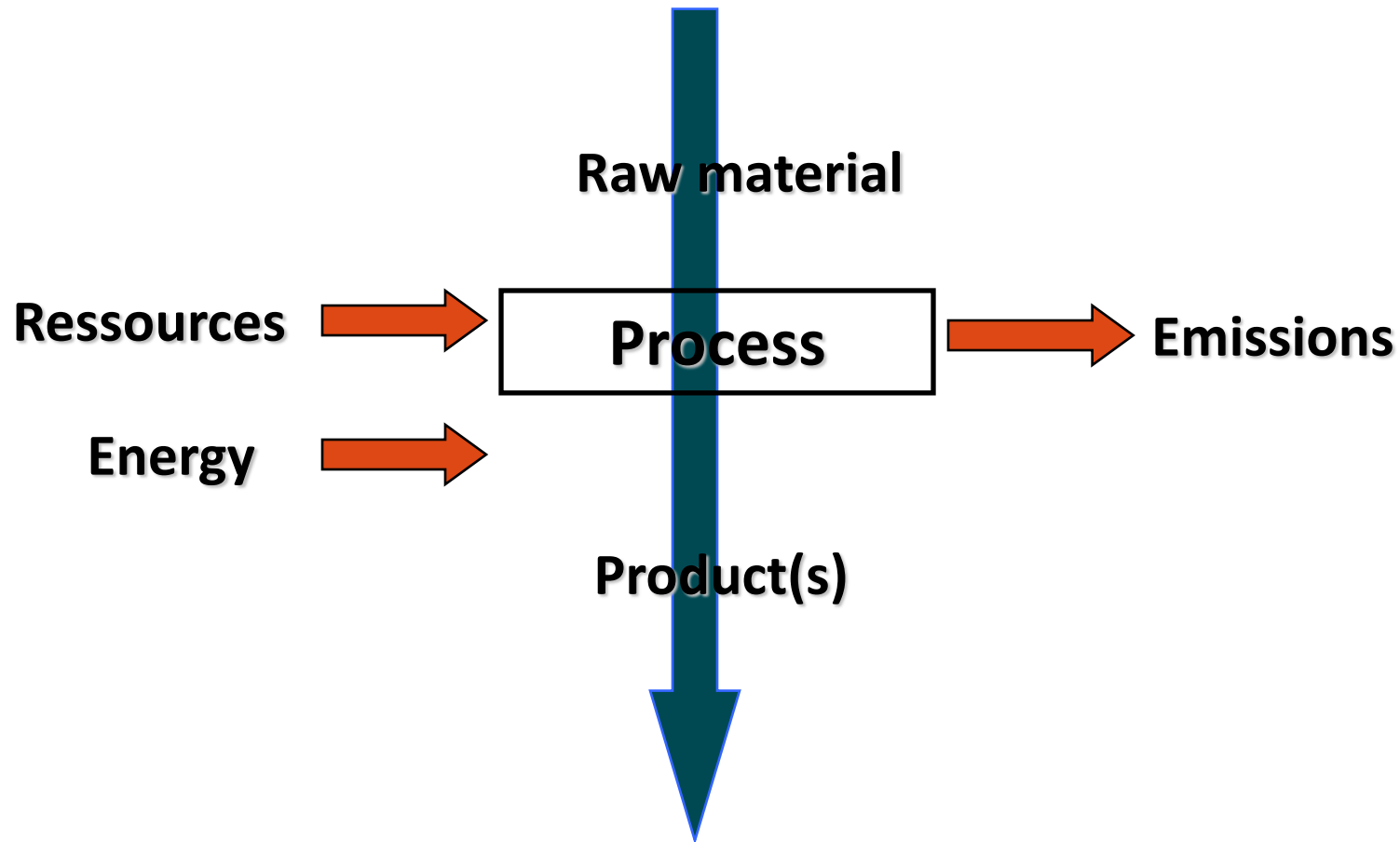
Wheat



Dry process



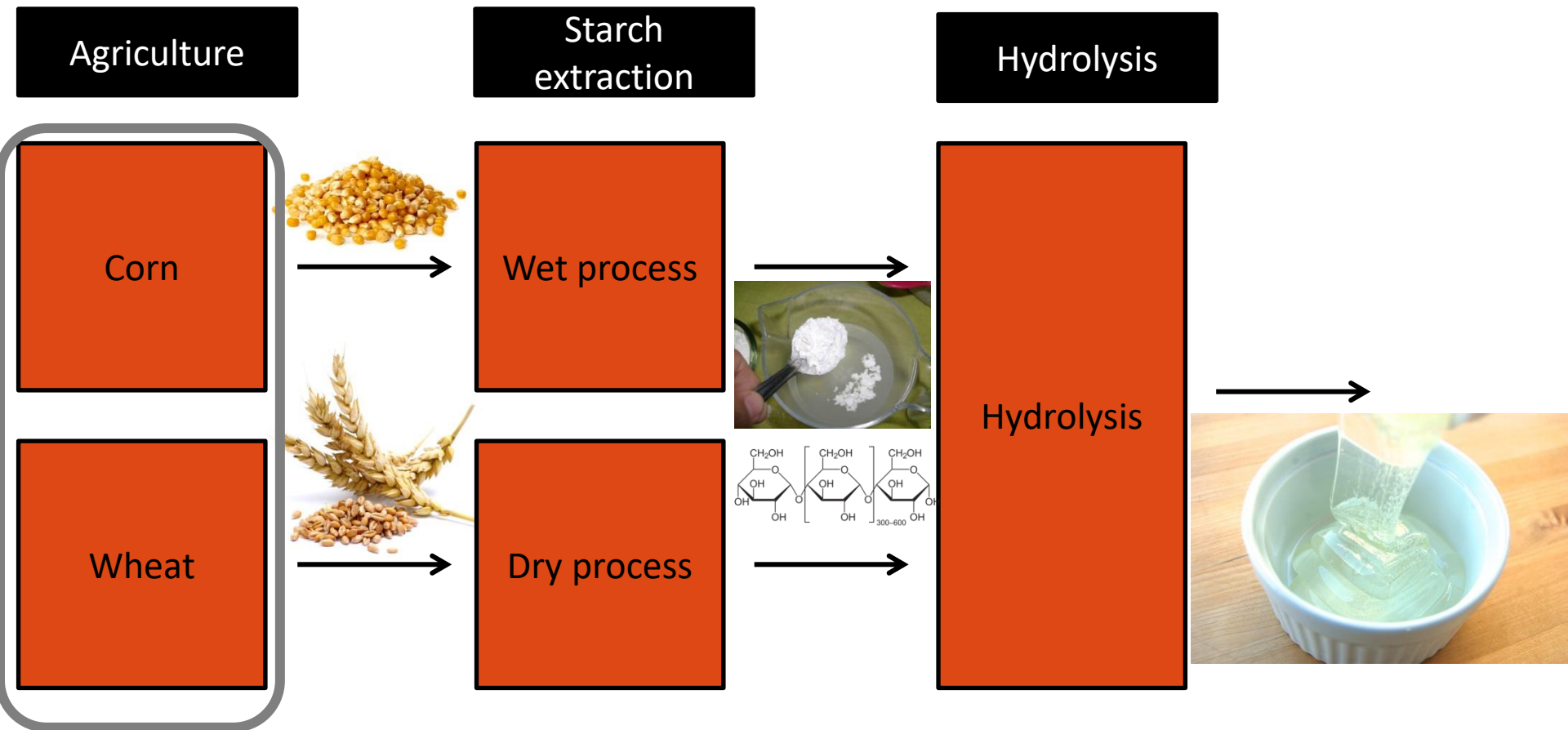
# Databases?



# Databases?

- Really useful for well-know processes
  - Electricity, etc.
  - And for agricultural processes?
- The two most used
  - GaBi database
  - Ecoinvent database

# Glucose?



# Glucose?

Agriculture

Corn

Wheat

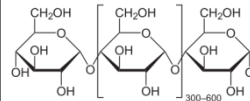
Starch  
extraction

Wet process

Dry process

Hydrolysis

Hydrolysis



PEPs

CHEMICAL  
ENGINEERING

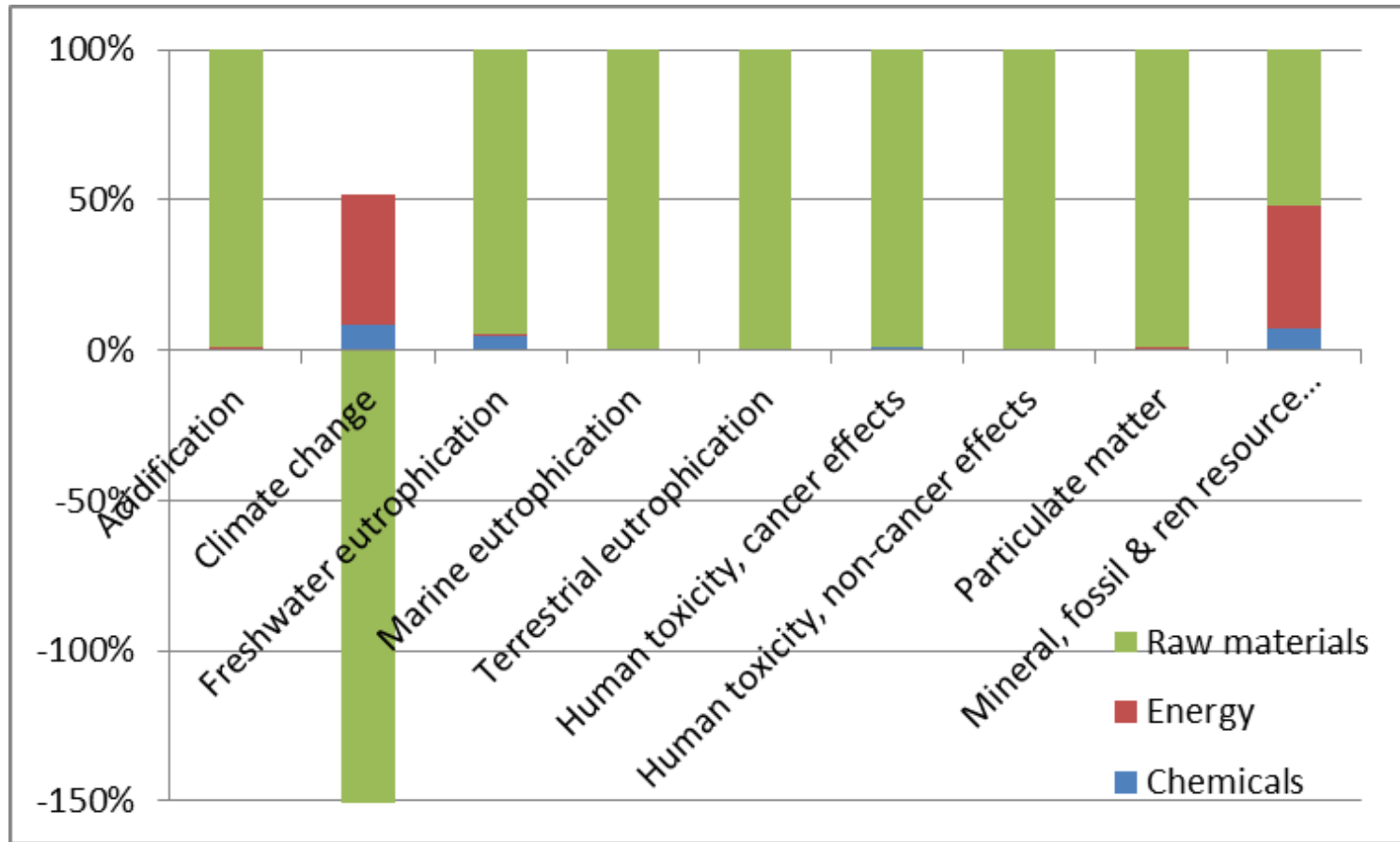
Université  
de Liège





# Agriculture?

- First test with GaBi database:

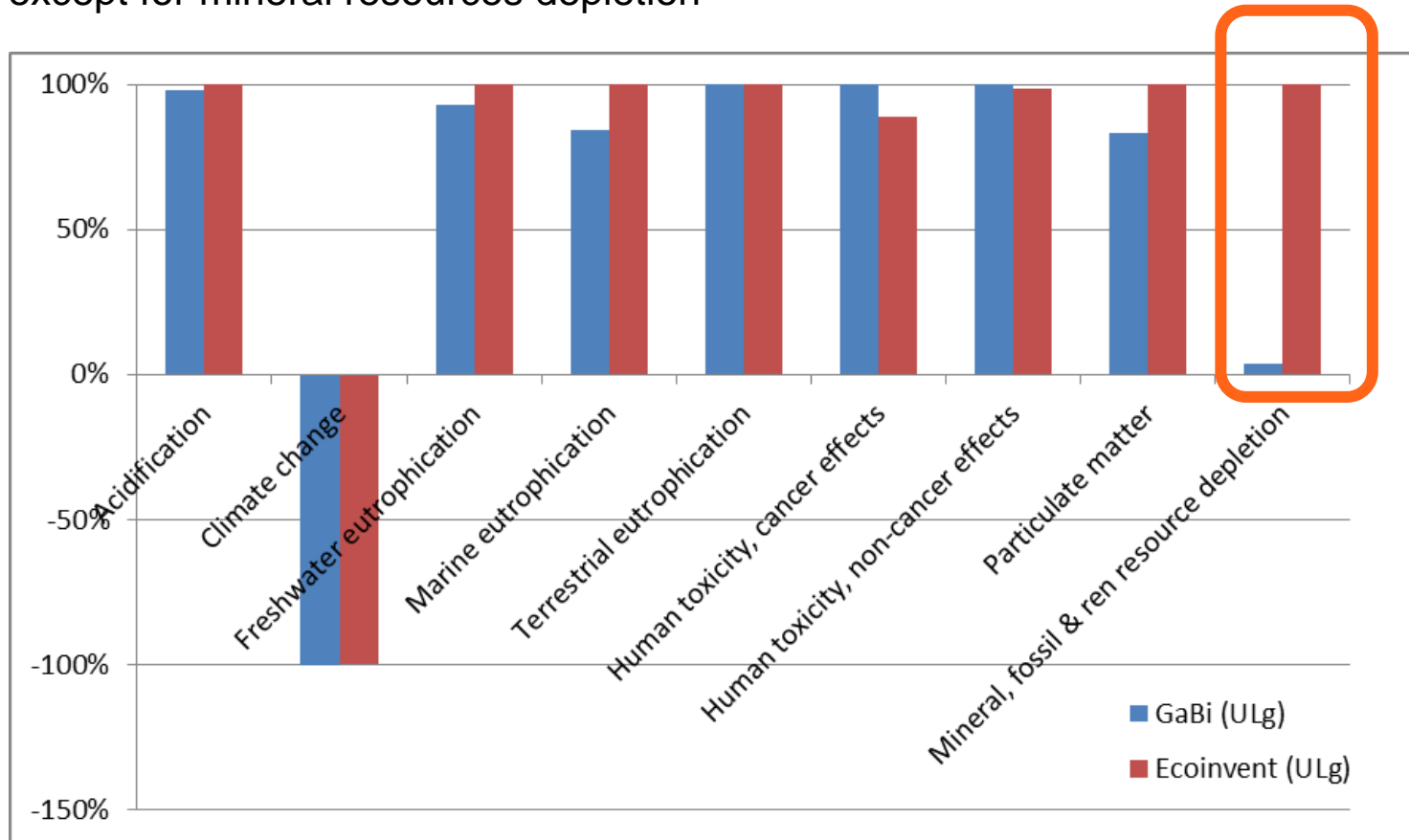


# Agriculture data?

- Belgian data from CRA-W model (fertilizer, transport processes, etc.) with
    - GaBi database
    - Ecoinvent database
  - Ecoinvent European dataset for corn/wheat
- ➔ Influence on the results?

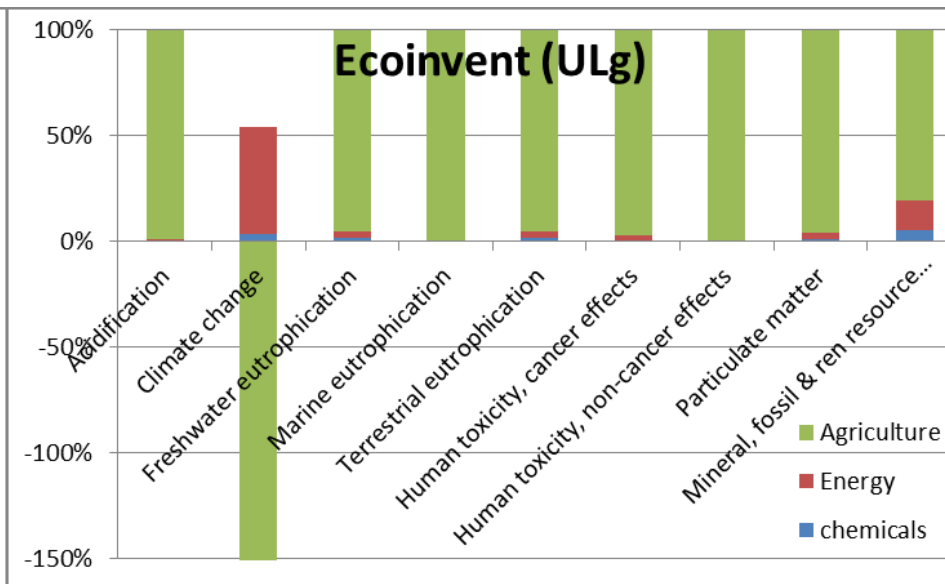
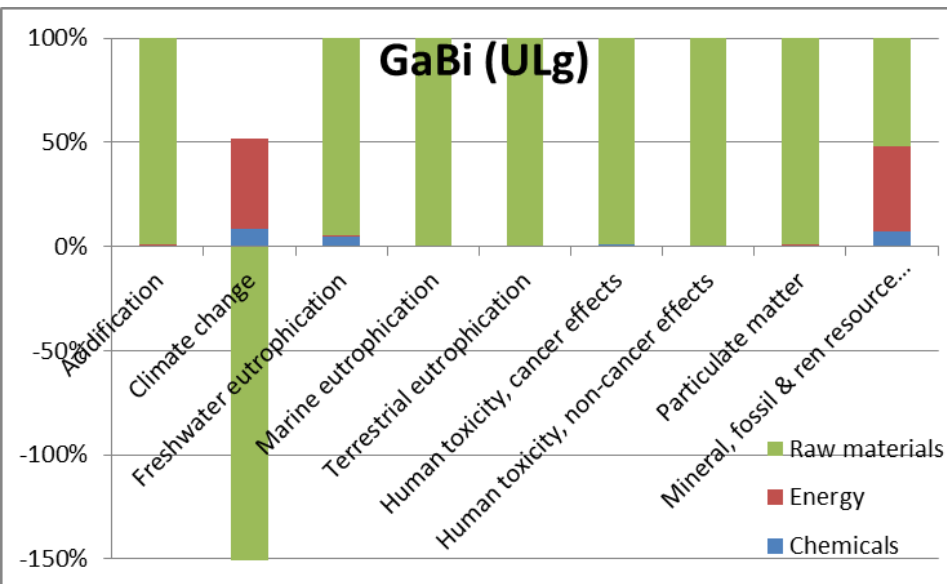
# CRA-W data

- Good accordance GaBi vs Ecoinvent
  - except for mineral resources depletion



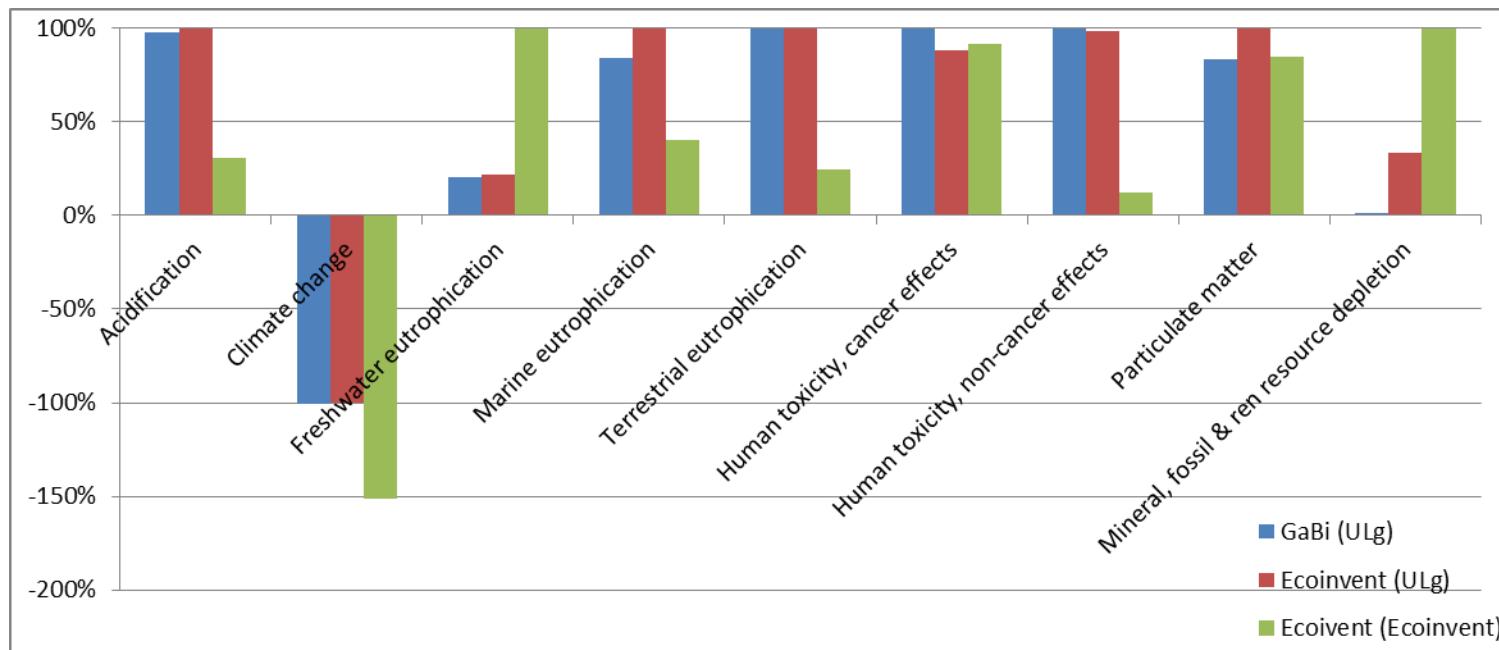
# Resources depletion?

- Differences in the modeling of the infrastructure
  - Differences in metals consumption (lead, indium, etc.)
  - → Differences in results!



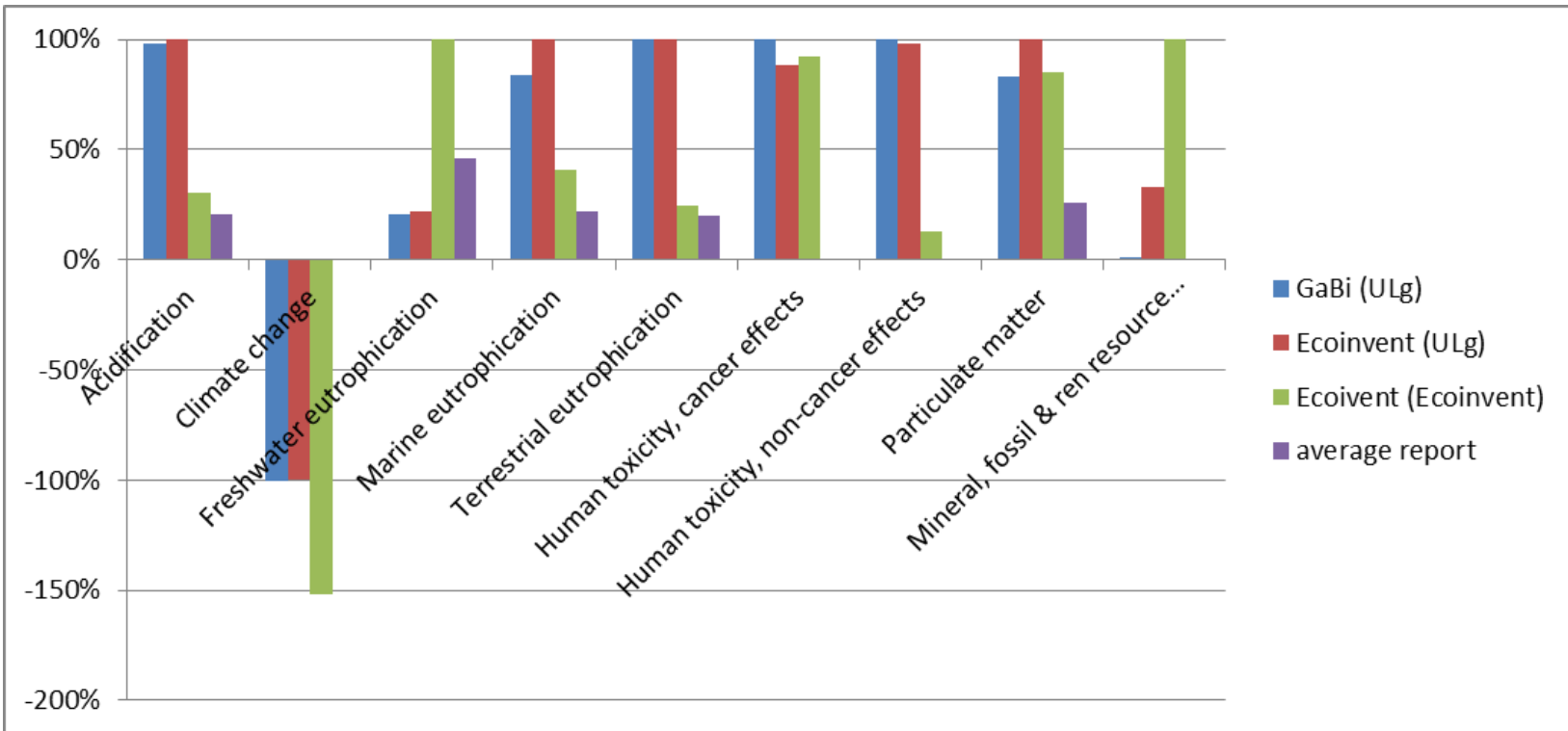
# Non-specific data

- If we use an Ecoinvent dataset (European average) for agriculture:
  - Large differences
  - We should be as specific as possible!



# Average studies?

## ■ Comparison impossible...



# Take home message

- People that do LCA should be
  - Really smart, ~~prudent and beautiful~~
  - Prudent when using datasets
  - As specific as possible
- Critical view of the results is Mandatory!
- LCA is young, still in improvement
- BUT no other method allows a complete view of the environmental impact!

---

# Thank you for your attention

---

Saïcha Gerbinet, Sandra Belboom and Angélique Léonard  
saicha.gerbinet@ulg.ac.be  
Products, Environment, and Processes (PEPs)  
Department of Chemical Engineering  
Université de Liège  
[www.chimapp.ulg.ac.be](http://www.chimapp.ulg.ac.be)

