Use of the GFLI database from a practitioner perspective

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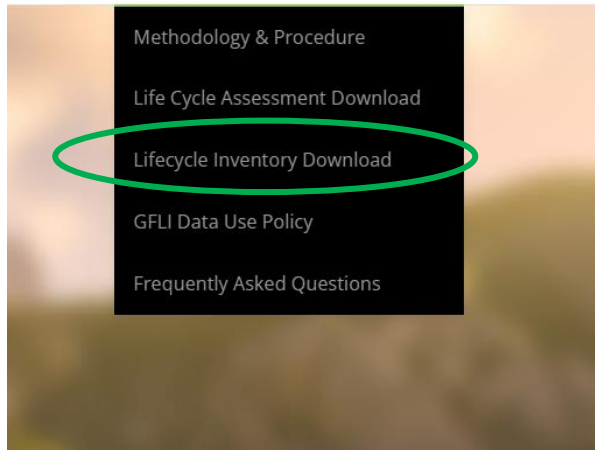
Agenda

1. GFLI Database download

2. Using the database

    a. Allocation methods

    b. Metadata

    c. Data quality rating

    d. Results example: climate change

    e. Market mixes

3. Conclusion

4. Q&A

GFLI Database download
Life Cycle Inventory vs Life Cycle Impact Assessment

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Methodology & Procedure

Life Cycle Assessment Download

Lifecycle Inventory Download

GFLI Data Use Policy

Frequently Asked Questions

Life Cycle Inventory

GFLI database for use in LCA softwares, containing the inventory data in aggregated format. Results need to be calculated in software.

Files are the original November 2020 files, and are not yet aligned with LCIA update of October 31, 2022
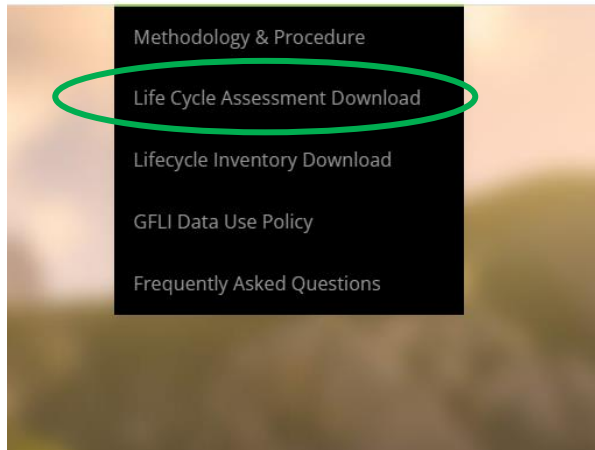
Environmental footprint 2.0 (XML)

LCI simapro (csv)

Free – Download

Free – Purchase

GFLI Database download
Life Cycle Inventory vs Life Cycle Impact Assessment

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Methodology & Procedure

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Frequently Asked Questions

Life Cycle Impact Assessment
GFLI database in Excel format, containing calculated impact results. LCIA database was updated in October 2022.

LCIA of 6 Brazilian products available as separate download. Calculated using a country-specific methodology (higher tier level) as opposed to the GFLI baseline methodology.

Impact assessment method
The method used to translate the „raw" inventory data to environmental impacts with characterization factors.

2 options available:
- Environmental Footprint v3.1 (EF3.1)
- ReCiPe 2016 midpoint (H)

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Global Metrics for Sustainable Feed

LCIA - database of feed materials

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gfli
Global Metrics for Sustainable Feed

Embrapa

LCIA - Brazilian crops

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ADM

GFLI LCIA Database
Allocation method

GFLI LCIA Database
Allocation method

Dividing impacts between products

Rapeseed processing example

Crush

Rapeseed → Crude oil

→ Rapeseed meal

Allocation methods of outputs - examples

- Mass: impacts divided based on weight and dry matter content
- Energy: impacts divided based on energy content
- Economic: impacts divided based on prices

Different methodologies for different products and markets

Examples:
PEFCR Feed: Economic
PEFCR Vegetable oil products: Energy
PEFCR Starch products: Mass

Important to remain consistent within your assessment!

GFLI LCIA Database
Allocation method – Effect on results

Rapeseed meal & oil production

Rapeseed crushing outputs	Economic allocation factor	Gross energy allocation factor	Mass allocation factor
Rapeseed meal	23,90%	35,30%	56,30%
Crude rapeseed oil	76,10%	64,70%	43,70%

Source: GFLI Methodology, Annex 4

Carbon footprint Rapeseed meal at French crushing plant (GFLI)

Example from previous GFLI database – allocation factors and results have changed since the update.
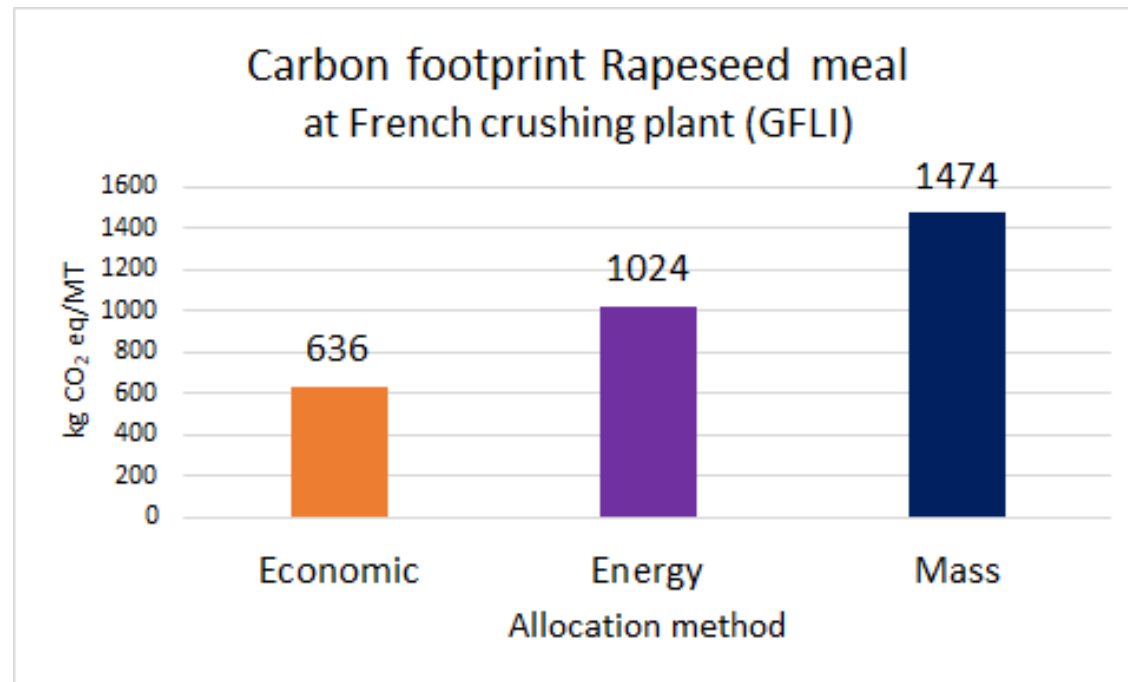
Source: GFLI Database 2021

GFLI LCIA Database
Metadata and Data Quality Rating

Products GFLI 2.0 database - economic allocation	Source	Year of publication	Dry matter content (g/kg)	Energy content (MJ/kg)	N-content (g/kg)	P-content (g/kg)	Market mix raw commodity	
Wheat grain, dried, production mix, at storage/GLO Economic S	AFP additional	2022					Production mix	

Products GFLI 2.0 database - economic allocation	Overall DQR	P	TiR	TeR	GR	
Wheat grain, dried, production mix, at storage/GLO Economic S	1,91	2,22	2,03	1,57	1,81	

Overall DQR = calculated data quality rating based on 4 parameters:

- Precision
- Time Representativeness
- Technological Representativeness
- Geographical Representativeness

Rating of representativeness/precision between **1 (highest score) and 5 (lowest score)**

DQR criteria matrix available in Annex 3 of GFLI methodology

GFLI LCIA Database
Results example: Climate change

Total per MT **Subcategories (sum = total)**

Products GFLI 2.0 database - economic allocation	Unit	Climate change (kg CO2 eq / ton product)	Climate change - Fossil (kg CO2 eq / ton product)	Climate change - Biogenic (kg CO2 eq / ton product)	Climate change - Land use and LU change (kg CO2 eq / ton product)	Climate change - Peat oxidation (kg CO2 eq / ton product)
Wheat grain, dried, production mix, at storage/GLO Economic S	ton	583,8	510,9	0,2	34,9	37,9

Climate change = the greenhouse gas emissions in kg CO_2 equivalent

- **Fossil**: emissions from fossil fuels – e.g. burning of natural gas
- **Biogenic**: emissions from above-ground biomass – e.g. combustion or landfilling
- **Land use (LU) and land use change (LUC)**: emissions from carbon stock changes - e.g. land conversion
- **Peat oxidation**: emissions from drained peat soils

Zampori & Pant, 2019 (Suggestions for updating the Product Environmental Footprint method)
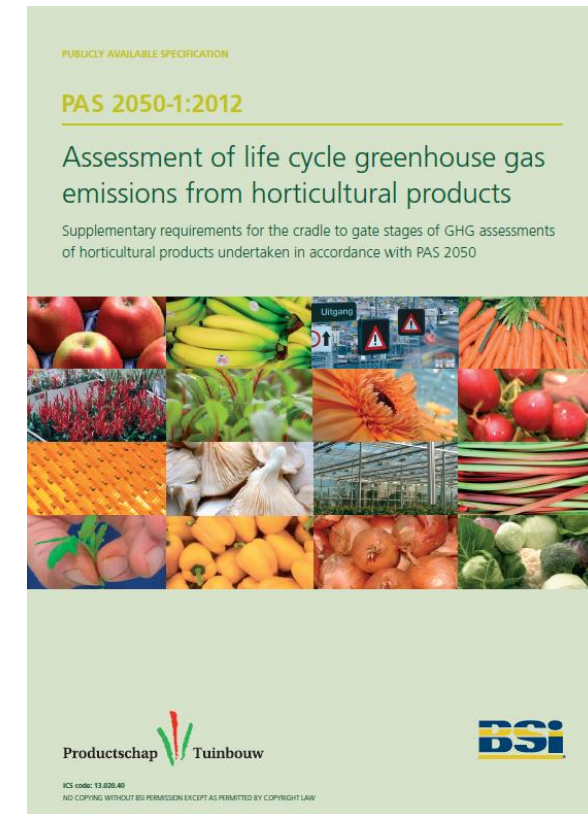
GFLI LCIA Database
Results example: Climate change – Land use and land use change (LUC)

Methodology applied in GFLI baseline method: PAS 2050:1 2012

The LUC emissions in the GFLI database represent a country-level, crop-specific average, which is calculated with secondary data following the PAS 2050 methodology. Calculation inputs include FAO national statistics from the past 20 years on cropland area expansion, forest area changes and more.

These LUC emissions are not representative for specific supply chains as they are based on national statistics.

Therefore high LUC emissions do not equal e.g. deforestation

GFLI LCIA Database
Market mix – applicable for processed products

Example: Origin composition of maize processed in Germany, e.g. *Maize flour, at processing/DE*

Market mix for	Commodity	Country of origin	ISO code	Quantity	Relative	Included?	Percent in mix	Coverage of
Germany	Maize	Germany	DE	4204960	0,62316	WAHR	62,32%	100,00%
Germany	Maize	Poland	PL	718602,4	0,1064943	WAHR	10,65%	100,00%
Germany	Maize	Ukraine	UA	619435,69	0,0917982	WAHR	9,18%	100,00%
Germany	Maize	France	FR	575156,63	0,0852362	WAHR	8,52%	100,00%
Germany	Maize	Hungary	HU	378562,6	0,0561016	WAHR	5,61%	100,00%
Germany	Maize	Czechia	CZ	116841,2	0,0173154	WAHR	1,73%	100,00%
Germany	Maize	Netherlands	NL	55748,086	0,0082617	WAHR	0,83%	100,00%
Germany	Maize	Russian Federation	RU	43302,4	0,0064173	WAHR	0,64%	100,00%
Germany	Maize	Romania	RO	35192,4	0,0052154	WAHR	0,52%	100,00%

- Maize from 9 different origins are included, with the highest share coming from Germany (62% of the volumes).
- Full market mix displayed (coverage of 100%) - No origin had to be left out due to unavailability or negligible contribution

| ... | Mass allocation - ReCiPe | Economic allocation - EF3.1 | Energy allocation - EF3.1 | Mass allocation - EF3.1 | Mapper GFLI 1.0 to 2.0 | Process descriptions | Market mix data | ⊕ |

Conclusion

For users, appropriate interpretation of the metrics is key to unlock the value of the GFLI database

The GFLI database provides LCA results of feed ingredients under a consistent methodology

High adoption of the database in our industry will increase alignment in the calculation and use of environmental metrics and set a common baseline

ADM

Questions?