Updates in GFLI v2

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STØTTET AF
Promilleafgiftsfonden for landbrug
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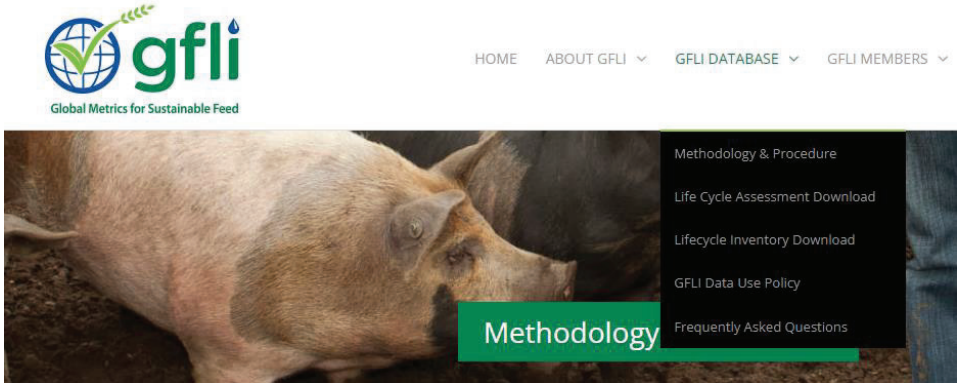
Main GFLI 2.0 updates

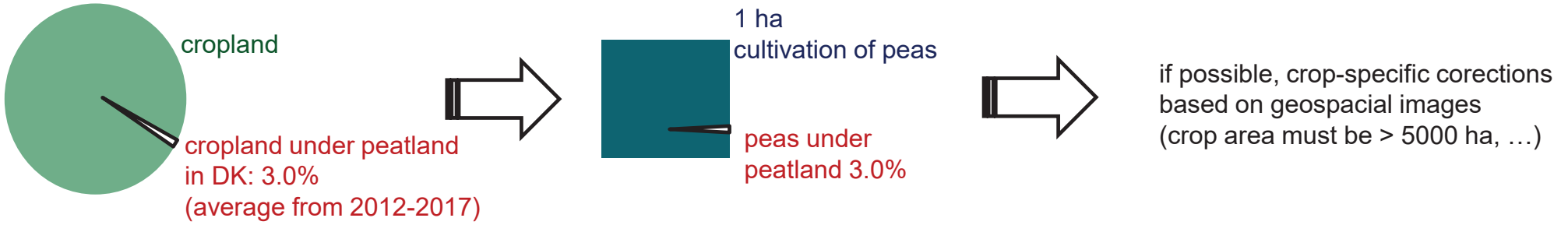
- Based on Agri-Footprint 6 (updated activity data)
  (+ some background datasets from Ecoinvent)
- ➢ Emission factors for cultivation based on IPCC 2019
- ➢ Emissions from peat soil oxidation included
- ➢ More transparency in the modelled processes
- Environmental impacts calculated based on EF 3.1 and Recipe 2016
- Further details on data collection from data-in projects (e.g. site-specific dLUC and site-specific peat soil)

Climate change EF3.1, characterization factors:
- CH_4: 27 – 29.8
- N_2O: 273

- More feeds, but no roughages nor organic products yet



GFLI 2.0 - peat soil oxidation, in practice



Emissions from peat soil degradation:

$$\frac{kg_{CO2}}{ha\ crop} = \frac{cropland_{peat}}{cropland} \cdot EF$$

	$\frac{cropland_{peat}}{cropland}$	EF
CO_2	from NIR if available, otherwise FAOstat	from NIR if available, otherwise IPCC 2013*
CH_4, N_2O	IPCC 2013*	IPCC 2013*

note: the methodology is overall comparable to 2.0-LCA (differences in EF values, and % peatland)

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* 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands

GFLI 2.0, quick view

Products GFLI 2.0 database - economic allocation	Climate change (kg CO2 eq / ton product)	Ozone depletion (kg CFC11 eq / ton product)	Ionising radiation (kBq U-235 eq / ton product)	Photochemical ozone formation (kg NMVOC eq / ton product)	Particulate matter (disease inc / ton product)	Human toxicity, non-cancer (CTUh / ton product)	Human toxicity, cancer (CTUh / ton product)	Acidification (mol H+ eq / ton product)	Eutrophication, freshwater (kg P eq / ton product)	Eutrophication, marine (kg N eq / ton product)	Eutrop on, terrest (mol N ton produc
Barley grain, dried, at storage/AR Economic S	3735.24	0.00	11.17	1.18	0.00	0.00	0.00	5.19	0.36	1.25	
Barley grain, dried, at storage/AT Economic S	343.93	0.00	9.97	1.61	0.00	0.00	0.00	4.97	0.25	6.53	
Barley grain, dried, at storage/AU Economic S	522.62	0.00	15.76	1.86	0.00	0.00	0.00	7.79	0.43	1.48	
Barley grain, dried, at storage/BE Economic S	360.49	0.00	8.94	1.71	0.00	0.00	0.00	11.92	0.54	9.02	

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

	A	B
1	GFLI deliverables v2	Process comment
	Barley grain, dried, at storage/DK Economic	Source of the data is: AFP 6.3. Overall DQR = 1.79 (P = 2.14, TiR = 1.92, TeR = 1.42 and GR = 1.68) This process describes the storage of Barley grain in Denmark. System boundary for this process ; includes: the cultivated agricultural product, silo as capital good and energy use required for safe storage in the ; form of electricity and heat from natural gas. Amount of electricity and heat used for storage is based on the ; amount of water that needs to be evaporated for safe storage. The humidity of the crop is: ; 15.0%, based on 5-year average Eurostat data (2014-2018), from Denmark. ; The humidity for safe storage is assumed to be 12.0%. Energy requirement per ; kg of evaporated water is 4.5 MJ heat from natural gas and 0.15 MJ electricity per kg of evaporated water. ; For more information see Agri-footprint reports.;; References:; Blonk Agri-footprint BV. (2022). Agri-footprint - Part 1 - Methodology and basic principles. Gouda, the Netherlands.; Blonk Agri-footprint BV. (2022). Agri-footprint - Part 2 - Description of data. Gouda, the Netherlands.; Eurostat (2021). Crop production Statistics, retrieved from: https://ec.europa.eu/eurostat/web/agriculture/data/database; The following data is included for cultivation process of Barley in Denmark. Considered activities include: varic ts like fertilizer, lime, pesticides, capital goods and energy use for field management and ir ons and emissions due to pesticide use, heavy metal emissions and emissions from peat oxid is: 65.00 kg N, 10.00 kg P205 and 17.00 kg K2O equivalents, based on IFA 2011. Specific fertiliz on Denmark (IFA, 2021). ; ;For arable cultivations, animal manure is applied for soil maintena for this type of cultivation is: 61.49 kg N and 39.24 kg P2O5 equivalents, based on data from F calculated based on adapted methodology described from Nemecek & Schnetzer (2012). literature concerning heavy metal contents of manure (Amlinger et al. 2004) and fertilize the 'blue water footprint' of Barley in Denmark, which is 0.18 m3/ton (Mekonnen & Hoeks ain water of 1230.69 m3/ha to the dataset. Both for rain and irrigation water the 'water requir Huijbregts et al (2016) ; ;Energy use for arable and orchard cultivations were calculated ba activities. Various inputs are used for the energy model including yield, irrigation water t of energy is based on 'Energy model for horticulture' which includes climate conditions to e determines the amount of insecticide, fungicide and herbicide specific for crop country c ore
14	Crude rapeseed oil (pressing), at processing/	Source of the data is: AFP 6.3. Overall DQR = 1.76 (P = 2.03, TiR = 1.98, TeR = 1.37 and GR = 1 crushing of rapeseed normally occurs in a series of process steps, including mechanical cr d some remains in the rapeseed meal. The price information used to determine the allocation can be found in "Agri-Footprint - Part 2 - Description of data" – Appendix B (Blonk Agri-footprint BV, 2014). ::For mechanical crushing of rapeseed the main data sources to determine the mass balance were Hamelinck (2008), Croezen & Kampman (2005) and Thamsiriroj (2008). These data sources also

Market mix for	Commodity	Country of origin	Percent in mix
Denmark	Rapeseed or colza seed	Denmark	86.33%
Denmark	Rapeseed or colza seed	Germany	3.51%
Denmark	Rapeseed or colza seed	Australia	2.51%
Denmark	Rapeseed or colza seed	Latvia	2.14%
Denmark	Rapeseed or colza seed	Lithuania	1.76%
Denmark	Rapeseed or colza seed	Sweden	1.62%
Denmark	Rapeseed or colza seed	Belgium	0.60%
Denmark	Rapeseed or colza seed	France	0.57%
Denmark	Rapeseed or colza seed	United Kingdom	0.48%
Denmark	Rapeseed or colza seed	Poland	0.24%
Denmark	Rapeseed or colza seed	Romania	0.22%
Denmark	Rapeseed or colza seed	Netherlands	0.01%

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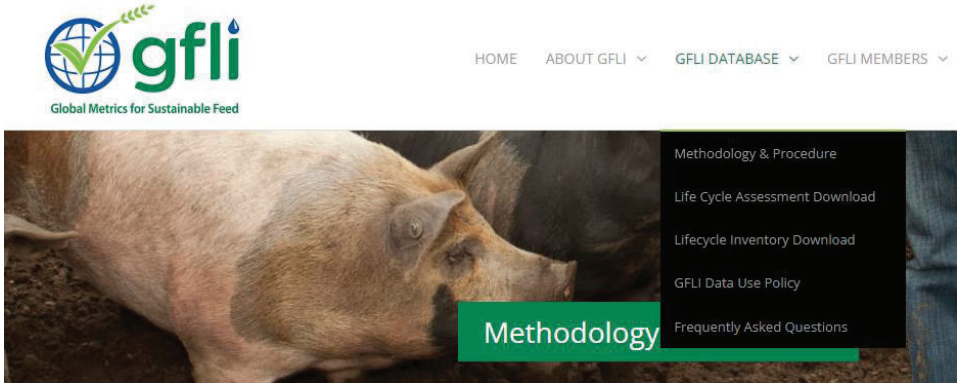

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