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Grown.bio provides packaging with mycelium instead of EPS. The difference in impact is calculated per year and the total impact of Grown.bio per year is calculated for 2100000 times L of packaging.

Extraction	We compare with EPS, in database is PS available (cradle-to-gate) hence here only raw materials for mycelium production. Custom materials is the hemp used for fibers
Production	EPS is in the database till expansion, so expansion calculated here separately. Mould(-s)(-making) equals for both processes. Our electricity is PV-panels
Reuse	we design the packaging in such a way, that after it has done its primary job (getting the product save from the manufacturer to the end-user) it can be re-used as something that is usually made of PE, for example a designer packaging for shoes that can be used as a (designer) storage box or a packaging for a glass candle that can be reused as a planter pot. We succeed in this aim in about 50% of our product volume
Waste	EPS is waste only. Non re-used mycelium will be industrial composted

Validation	By: Bram van der Grinten, Started: Fri May 22 2020 14:07:02 CET, Completed: Fri May 22 2020 14:25:08 CET
Strong points	The use of hemp (a natural carbon sink) and mycelium to prevent the use of expanded polystyrene, reduces GHG emissions in two ways. This ensures the positive climate impact of Grown.bio
Sensitivity	The positive impacts outweigh negative impacts of ingredients and processing, even if significantly higher amounts of energy and materials were needed.

Extraction

	Growing hemp, cutting into fiber and drying		-1.8	per kg	0.13	kg		-0.234	
	Truck+trailer 24 tons net (max weight/volume)		0.0271	per m3km	128	and			0.00347

Production

	Flour, wheat fresh		0.68	per kg	0.006	kg			0.00408
	Heat from steam (natural gas) for chemical processing		0.07	per MJ	0.211	MJ			0.01477
	drinking water europe*		0.00052	per kg	0.115	kg			0.00006
	PS expansion to EPS		3.9	per kg	0.05	kg		-0.195	
	PV panel on roof (mid Germany)		0.0208	per MJ	0.125	MJ			0.0026
	PS (EPS, expandable polystyrene)*		3.56	per kg	0.05	kg		-0.178	

Reuse

	PE (HDPE, High density Polyethylene)*		2	per kg	0.01	kg		-0.02	
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Waste

	PS (Polystyrene) co-firing in electrical power		0.28	per kg	0.05	kg		-0.014	
	Industrial composting of mycelium		0.036	per L	0.5	L			0.018

Grown.bio's total impact per year		Carbon footprint CO ₂ eq.		
eco-costs of human health euro	unknown	Impact per L of packaging	-0.598 kg	
eco-costs of eco-toxicity euro	unknown			
eco-costs of resource depletion euro	unknown	Impact of 2100000 times L of packaging	-1256 ton	
eco-costs of carbon footprint euro	unknown			
Equivalent to		Impact validation	Valid, positive and significant	BG A105
			All data and assumptions are approved	
57083 trees		258 Average human: ▾		