



Avoided methane emissions from manure digestion

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Common practice: Store manure in open tanks and then spread it as fertilizer → High GHG emissions
 If manure is digested, CH₄ is collected and burnt to CO₂.

EMISSIONS	UNIT	Storing		Spreading
		Open air	Closed tank	
DIGESTED MANURE				
CH ₄	Kg/kg ⁻¹	1.343 10 ⁻³	0	2 10 ⁻⁶
UNDIGESTED MANURE				
CH ₄	Kg/kg ⁻¹	4.046 10 ⁻³	-	1.3 10 ⁻⁶

Three approaches were considered for the calculation of the credits:

1. WTW approach

1. Calculations based on measured emissions (Amon et al. 2006)

1. Calculations based on modelled emissions (Sommer et al. 2004)

$$0.15 \text{ MJ}_{\text{CH}_4} / \text{MJ}_{\text{biogas}}$$

Credits Manure



Results for GHG emissions savings with and without credits

PATHWAY	UNITS	GHG EMISSIONS		GHG SAVINGS WITHOUT CREDITS	
		Without credits	With credits	Electricity	Heat
Biogas from manure for electricity					
Open digestate	gCO ₂ / MJ _{el}	39.5	-35.5	40.4 %	
Closed digestate	gCO ₂ / MJ _{el}	14.3	-57.1	78.4 %	
Biogas from manure for biomethane					
Open digestate – No off-gas combustion	gCO ₂ / MJ _{CH₄}	53.2	-31.3	42.2 %	23.2%
Open digestate – Off-gas combustion	gCO ₂ / MJ _{CH₄}	38.2	-46.3	58.5 %	44.9 %
Closed digestate – No off-gas combustion	gCO ₂ / MJ _{CH₄}	23.9	-56.0	74.0 %	65.5 %
Closed digestate – Off-gas combustion	gCO ₂ / MJ _{CH₄}	8.9	-71.0	90.3 %	87.1 %



Thanks for your attention

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