

Global Warming Potential, other Coefficients for Calculating Emissions and Sequestration in CO₂ equivalents

Global warming potential coefficients for the most commonly emitted greenhouse gasses, published by the International Panel of Climate Change, IPCC¹, the UK government², the International Civil Aviation Organization, ICAO³, and Icelandic coefficients that are used for calculating CO₂-equivalents in emissions and sequestration^{4,5,6}.

100-YEAR GLOBAL WARMING POTENTIAL (GWP) FOR CALCULATING CO ₂ -EQUIVALENCIES OF GREENHOUSE GASSES		
GREENHOUSE GAS	COEFFICIENT	SOURCE
Carbon dioxide (CO ₂)	1	IPCC ¹
Methane (CH ₄)	28	
Nitrous oxide (N ₂ O)	265	
Tetrafluorethane (HFC-134a)	1,300	
Sulphur hexafluoride (SF ₆)	23,500	

EMISSION FACTORS FOR CALCULATION OF CO ₂ EMISSIONS/SEQUESTATION				
TYPE OF EMISSION / SEQUESTATION	ENERGY SOURCE/ SEQUESTATION	UNITS	COEFFICIENT	SOURCE
Transportation / Backup power	Gasoline	kg CO ₂ /L fuel	2.20	Department for Business, Energy & Industrial Strategy ²
	Diesel	kg CO ₂ /L fuel	2.63	
	Methane	kg CO ₂ /L fuel	0.28	U.S. Argonne National Laboratory ³
	Flight emissions	See calculator ⁴	Variable ⁵	International Civil Aviation Organization (ICAO) ⁴
Sequestration of CO ₂ in Nature	Forestry	t CO ₂ /ha ⁶	6.3	Joel Chales Owona 2019
	Land reclamation	t CO ₂ /ha ⁷	2.75	National Inventory Report 2008
Emission Mitigation	Wetland reclamation	t CO ₂ /ha ⁸	20	Gudmundsson, J., & Oskarsson, H. 2014.

¹ IPCC, 2013: *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. <https://www.ipcc.ch/report/ar5/wg1/>

² Emission factors for transportation and waste: UK Department for Business, Energy & Industrial Strategy. <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

³ Mintz, M., et al. Well-to-Wheels analysis of landfill gas-based pathways and their addition to the GREET model. No. ANL/ESD/10-3. Argonne National Lab.(ANL), Argonne, IL (United States), 2010.

⁴ Calculator for flight emissions: <http://www.icao.int/environmental-protection/CarbonOffset/Pages/default.aspx> Um On premises of calculator: http://www.icao.int/environmentalprotection/CarbonOffset/Documents/Methodology_ICAO_Carbon_Calculator_v9_2016.pdf

⁵ Coefficient factors depend on fuel type, length of flight, type of aircraft, weight of cargo, etc

⁶ Joel Chales Owona 2019. Áhrif nýskógræktar á kolefnisbindingu í jarðvegi á Íslandi. <https://skemman.is/handle/1946/34470>

⁷ National Inventory Report 2008, https://www.ust.is/library/Skrar/Atvinnulif/Loftslagsbreytingar/ICELAND_NIR_2010.pdf

⁸ Gudmundsson, J., & Oskarsson, H. 2014. *Carbon dioxide emission from drained organic soils in West-Iceland*. Soil carbon sequestration for climate food security and ecosystem services pp. 155-159.

EMISSION FACTORS FOR WASTE EMISSION CALCULATIONS

Waste Classification from Waste Collectors	Associated UK Waste Category	Assumed Disposal Method	UK Emission Factors ⁸
General waste	Municipal Waste	Landfill	0.586
Bulk waste	Commercial and Industrial Waste	Landfill	0.099
Asbestos	Asbestos	Landfill	0.001
Sludge (solid constituents from sewage)	Sewage (divided into Plastics, Organic: Food and Drink Waste, Soils)	Landfill	0.271
Green bin	Plastics: average plastics	Combustion	0.021
Metals	Metal: scrap metal	Closed-Loop	0.021
Timber – unpainted	Wood	Landfill	0.828
Timber – painted	Wood	Landfill	0.828
Garden waste	Organic: garden waste	Landfill	0.579
Glass and minerals	Glass	Open-Loop	0.021
Plastic	Plastics: average plastics	Combustion	0.021
Corrugated cardboard	Paper and board: board	Closed-Loop	0.021
Mixed cardboard and paper	Paper and board: mixed	Closed-Loop	0.021
Office paper	Paper and board: paper	Closed-Loop	0.021
Newspapers and magazines	Paper and board: paper	Closed-Loop	0.021
Organic waste	Organic: mixed food and garden waste	Landfill	0.579
Unknown substances	Municipal Waste	Landfill	0.586
Light bulbs	WEEE – small	Landfill	0.016
Batteries	Batteries	Landfill	0.016
Car batteries	Batteries	Landfill	0.016
Electronic equipment	WEEE – large	Landfill	0.016
Paint and print waste	Commercial and industrial waste	Landfill	0.099
Oil and oil contaminated waste	Commercial and industrial waste	Landfill	0.099
Solvents	Commercial and industrial waste	Landfill	0.099
Organic pollutants, cooking oil	Commercial and industrial waste	Landfill	0.099
Inorganic pollutants	Commercial and industrial waste	Landfill	0.099