

## Emission factors in kg CO2-equivalent per unit

Categories			Label		Default value	
Category 1	Category 2	Category 3	Title	Unit	Emission factor (kg CO2eq per unit)	Uncertainty
Conversion	Gas	GWP	GWP CH4	kg	25.00	0%
Conversion	Gas	GWP	GWP N2O	kg	298.00	0%
Energy	Electricity	Country	Canada	kWh	0.19	10%
Energy	Heat	Combustible	Black coal	kWh	0.32	
Energy	Heat	Combustible	Brown coal	kWh	0.40	10%
Energy	Heat	Combustible	Brown coal briquette	kWh	0.40	10%
Energy	Heat	Combustible	Brown coal coke	kWh	0.50	10%
Energy	Heat	Combustible	CNG	kWh	0.18	
Energy	Heat	Combustible	Coal coke	kWh	0.39	10%
Energy	Heat	Combustible	Crude oil	kWh	0.27	5%
Energy	Heat	Combustible	Diesel (kWh)	kWh	0.30	5%
Energy	Heat	Combustible	Diesel (liter)	liter	2.79	5%
Energy	Heat	Combustible	Ethane	kWh	0.20	
Energy	Heat	Combustible	Fuel oil (kWh)	kWh	0.29	5%
Energy	Heat	Combustible	Fuel oil (liter)	liter	3.19	5%
Energy	Heat	Combustible	Gas flared	kg	3.53	
Energy	Heat	Combustible	Kerosene	kWh	0.27	5%
Energy	Heat	Combustible	LNG (kWh)	kWh	0.21	5%
Energy	Heat	Combustible	LPG (liter)	liter	1.69	10%
Energy	Heat	Combustible	Natural gas	kWh	0.21	5%
Energy	Heat	Combustible	Petroleum coke	kWh	0.35	10%
Energy	Heat	Combustible	UNG	kWh	0.18	
Energy	Heat	Organic combustible	Biodiesel (kWh)	kWh	0.01	
Energy	Heat	Organic combustible	Biodiesel (liter)	liter	0.81	
Energy	Heat	Organic combustible	Bioethanol	kg	1.21	10%
Energy	Heat	Organic combustible	Biogas (kg)	kg	1.61	
Energy	Heat	Organic combustible	Biogas (kWh)	kWh	0.02	
Energy	Heat	Organic combustible	Biogas (m3)	m3	0.12	
Energy	Heat	Organic combustible	Biomass (kg)	kg	0.11	10%
Energy	Heat	Organic combustible	Biomass (kWh)	kWh	0.03	10%
Energy	Heat	Organic combustible	Methanol	kg	0.30	
Energy	Heat	Organic combustible	Petrol, 85% ethanol	kg	1.16	
Energy	Heat	Steam	Steam	kg	0.61	0%
Material	Building	Insulation	Glasswool	kg	1.35	
Material	Building	Insulation	Insulation	kg	1.86	
Material	Building	Insulation	Mineral wool	kg	1.20	
Material	Building	Insulation	Wool	kg	0.15	
Material	Building	Insulation	Wool r.	kg	3.17	
Material	Construction material	Cement	Cement	kg	0.89	20%
Material	Construction material	Concrete	Concrete (kg)	kg	0.15	20%
Material	Construction material	Concrete	Concrete (m3)	m3	263.00	
Material	Construction material	Concrete	Reinforced concrete	kg	0.36	20%
Material	Construction material	Fibre	Fibreglass	kg	2.60	20%
Material	Construction material	Gravel	Gravel	ton	4.32	
Material	Construction material	Lime	Lime	kg	0.74	
Material	Construction material	Other	Anthracite	kg	0.53	10%
Material	Construction material	Other	Other	kg	3.00	80%
Material	Construction material	Sand	Sand	kg	0.01	
Material	Iron metal	Iron	Cast iron	kg	1.51	
Material	Iron metal	Iron	Iron	kg	1.91	
Material	Iron metal	Steel	Reinforced steel	kg	1.49	
Material	Iron metal	Steel	Stainless steel	kg	6.15	
Material	Iron metal	Steel	Steel	kg	1.77	
Material	Iron metal	Steel	Steel r.	kg	0.88	10%
Material	Iron metal	Steel	Steel v.	kg	3.29	10%
Material	Non Iron metal	Aluminium	Aluminium	kg	8.14	
Material	Non Iron metal	Aluminium	Aluminium r.	kg	2.01	30%
Material	Non Iron metal	Aluminium	Aluminium v.	kg	11.89	30%
Material	Non Iron metal	Copper	Copper	kg	2.77	50%
Material	Non Iron metal	Copper	Copper v.	kg	3.83	
Material	Non Iron metal	Glass	Glass	kg	0.85	
Material	Non Iron metal	Glass	Glass r.	kg	0.73	20%
Material	Non Iron metal	Glass	Glass v.	kg	4.40	20%
Material	Non Iron metal	Lead	Lead	kg	1.64	30%
Material	Non Iron metal	Lead	Lead r.	kg	0.53	
Material	Non Iron metal	Lead	Lead v.	kg	2.61	
Material	Non Iron metal	Nickel	Nickel	kg	11.53	30%
Material	Non Iron metal	Other	Other metal	kg	4.40	80%
Material	Non Iron metal	Zinc	Zinc	kg	3.41	20%

Material	Non Iron metal	Zinc	Zinc r.	kg	0.48	
Material	Non Iron metal	Zinc	Zinc v.	kg	3.86	
Material	Other	Battery&pile	Battery Alkaline	kg	0.07	
Material	Other	Battery&pile	Battery NiCd	kg	0.21	
Material	Other	Battery&pile	Battery NiMH	kg	57.40	
Material	Other	Board	Board	kg	2.20	20%
Material	Other	Monetary	Electronic	kEUR	550.00	50%
Material	Other	Monetary	Mechanical	kEUR	733.33	50%
Material	Other	Monetary	Monetary ratio 1	kEUR	36.67	50%
Material	Other	Monetary	Monetary ratio 2	kEUR	110.00	50%
Material	Other	Monetary	Monetary ratio 3	kEUR	165.00	50%
Material	Other	Monetary	Monetary ratio 4	kEUR	183.33	50%
Material	Other	Monetary	Monetary ratio 5	kEUR	220.00	50%
Material	Other	Monetary	Monetary ratio 9	kEUR	1,833.33	50%
Material	Other	Monetary	Services highly material	kEUR	110.00	50%
Material	Other	Monetary	Services slightly material	kEUR	36.67	50%
Material	Other	Paper	Paper	kg	2.42	20%
Material	Other	Waste	Waste	ton	14.67	50%
Material	Other	Waste	Waste plastics	ton	1,739.67	20%
Material	Plastic	Fibre	GRP	kg	8.10	
Material	Plastic	Other	Other plastic	kg	2.70	20%
Material	Plastic	Rubber	Rubber	kg	3.18	
Material	Plastic	Rubber	Rubber latex	kg	1.63	
Material	Plastic	Rubber	Rubber synt.	kg	4.02	
Material	Plastic	Thermodurcible	Polyurethane flex.	kg	4.99	40%
Material	Plastic	Thermodurcible	Polyurethane rig.	kg	3.61	
Material	Plastic	Thermoplastic	ABS	kg	3.46	
Material	Plastic	Thermoplastic	EVAC	kg	2.11	
Material	Plastic	Thermoplastic	HDPE r.	kg	1.10	20%
Material	Plastic	Thermoplastic	HDPE v.	kg	1.90	20%
Material	Plastic	Thermoplastic	LDPE r.	kg	1.01	20%
Material	Plastic	Thermoplastic	LDPE v.	kg	2.06	20%
Material	Plastic	Thermoplastic	Nylon	kg	7.90	
Material	Plastic	Thermoplastic	PE	kg	2.40	
Material	Plastic	Thermoplastic	PET r.	kg	1.76	20%
Material	Plastic	Thermoplastic	PET v.	kg	5.44	20%
Material	Plastic	Thermoplastic	Polystyrene	kg	3.07	
Material	Plastic	Thermoplastic	PP gra.	kg	1.95	
Material	Plastic	Thermoplastic	PVC r.	kg	0.48	20%
Material	Plastic	Thermoplastic	PVC v.	kg	2.22	20%
Material	Plastic	Thermoplastic	SAN	kg	3.46	
Process	Water	Other	Tap water	m3	0.32	
Process	Water	Other	Water	m3	0.03	
Process	Water	Other	Water decarb.	m3	0.01	
Process	Water	Other	Water deion.	m3	0.80	
Process	Water	Other	Water soif.	m3	0.02	
Reagent	Chemical	Al(OH)3	Aluminium hydroxide, Al(OH)3	kg	0.66	
Reagent	Chemical	Al2(SO4)3	Aluminium sulphate, powder, Al2(SO4)3	kg	0.50	
Reagent	Chemical	Al2O3	Aluminium oxide, Al2O3	kg	1.23	
Reagent	Chemical	AlCl3	Aluminium chloride, AlCl3	kg	0.60	0%
Reagent	Chemical	Alcool	Alcohol	kg	1.47	25%
Reagent	Chemical	C2Cl4	Tetrachloroethylene, C2Cl4	kg	3.90	
Reagent	Chemical	C2H3ClO2	Chloroacetic acid, C2H3ClO2	kg	2.20	
Reagent	Chemical	C2H6O	Ethanol from ethylene, C2H6O	kg	1.24	
Reagent	Chemical	C2HCl3	Trichloroethylene, C2HCl3	kg	0.45	
Reagent	Chemical	C3H6O	Acetone, liquid, C3H6O	kg	2.19	
Reagent	Chemical	C3H6O	Propanal, C3H6O	kg	3.32	
Reagent	Chemical	C3H7OH	Isopropanol, C3H7OH	kg	1.85	
Reagent	Chemical	C3H8O	1-propanol, C3H8O	kg	3.84	
Reagent	Chemical	C3H8O2	Propylene glycol, C3H8O2	kg	4.14	
Reagent	Chemical	C4H10O	Isobutanol, C4H10O	kg	2.27	
Reagent	Chemical	C4H8O	Tetrahydrofuran, C4H8O	kg	5.78	
Reagent	Chemical	C5H12	Pentane, C5H12	kg	1.09	
Reagent	Chemical	C5H12O	1-pentanol, C5H12O	kg	4.52	
Reagent	Chemical	C6H14	Hexane, C6H14	kg	0.62	50%
Reagent	Chemical	C6H14O4	Triethylene glycol, C6H14O4	kg	3.09	
Reagent	Chemical	C6H4Cl2	o-dichlorobenzene, C6H4Cl2	kg	12.20	
Reagent	Chemical	C6H4Cl2	p-dichlorobenzene, C6H4Cl2	kg	12.20	
Reagent	Chemical	C6H5Cl	Monochlorobenzene, C6H5Cl	kg	12.20	
Reagent	Chemical	C6H5OH	Phenol, C6H5OH	kg	3.87	
Reagent	Chemical	C6H6	Benzene, C6H6	kg	1.76	
Reagent	Chemical	C7H16	Heptane, C7H16	kg	0.92	
Reagent	Chemical	C7H8 (C6H5CH3)	Toluene, C7H8 (C6H5CH3)	kg	1.47	
Reagent	Chemical	CaC2	Calcium carbide, technical grade, CaC2	kg	3.68	
Reagent	Chemical	CaCl2	Calcium chloride, CaCl2. CaCl2	kg	0.89	
Reagent	Chemical	CH2O2	Formic acid, CH2O2	kg	2.51	
Reagent	Chemical	CH3OH	Methyl alcohol, CH3OH	kg	0.66	50%

Reagent	Chemical	CHCl3	Trichloromethane, CHCl3	kg	4.13	
Reagent	Chemical	Cl	Chlorine, liquid, Cl	kg	1.08	
Reagent	Chemical	ClO2	Chlorine dioxide, ClO2	kg	6.33	
Reagent	Chemical	CO	Carbon monoxide, CO	kg	1.57	
Reagent	Chemical	CO2	Carbon dioxide liquid, CO2	kg	0.82	
Reagent	Chemical	Cu2O	Copper oxide, Cu2O	kg	2.07	
Reagent	Chemical	CuCO3	Copper carbonate, CuCO3	kg	2.00	
Reagent	Chemical	F	Fluorine, liquid, F	kg	11.40	
Reagent	Chemical	FeCl3	Iron (II) chloride, 40% in H2O, FeCl3	kg	0.18	
Reagent	Chemical	H	Hydrogen, liquid, H	kg	1.63	
Reagent	Chemical	H2O2	Hydrogen peroxide, 50% in H2O, H2O2	kg	1.14	
Reagent	Chemical	H2SiF6	Fluosilic acid, 22% in H2O, H2SiF6	kg	0.97	
Reagent	Chemical	H2SO4	Sulphuric acid, H2SO4	kg	0.14	50%
Reagent	Chemical	H3BO3	Boric acid, anhydrous, powder, H3BO3	kg	0.72	
Reagent	Chemical	H3PO4	Phosphoric acid, industrial grade, 85% in H2O, H3PO4	kg	1.45	50%
Reagent	Chemical	HCl	Hydrochloric acid, 30% in H2O, HCl	kg	1.20	50%
Reagent	Chemical	HCl	Hydrochloric acid, HCl	kg	0.89	
Reagent	Chemical	HCN	Hydrogen cyanide, HCN	kg	7.06	
Reagent	Chemical	HF	Hydrogen fluoride, HF	kg	2.82	
Reagent	Chemical	HNO3	Nitric acid production - Atmospheric pressure plants (low pressure), HNO3	kg	1.55	
Reagent	Chemical	HNO3	Nitric acid production - High pressure plant, HNO3	kg	2.79	
Reagent	Chemical	HNO3	Nitric acid production - Medium pressure combustion plant, HNO3	kg	2.17	
Reagent	Chemical	HNO3	Nitric acid, 50 % in H2O, HNO3	kg	3.18	
Reagent	Chemical	Inorganic	Carbon black	kg	2.38	
Reagent	Chemical	Inorganic	Silicone product	kg	2.67	
Reagent	Chemical	K2CO3	Potassium carbonate, K2CO3	kg	2.38	
Reagent	Chemical	K2O	Potassium carbonate, by ton of K2O	kg	0.69	30%
Reagent	Chemical	KClO4	Potassium perchlorate, KClO4	kg	5.09	
Reagent	Chemical	KOH	Potassium hydroxide, KOH	kg	1.94	
Reagent	Chemical	MgO	Magnesium oxide, MgO	kg	1.06	
Reagent	Chemical	MgSO4	Magnesium sulphate, MgSO4	kg	0.30	
Reagent	Chemical	N	Nitrogen, liquid	kg	0.43	
Reagent	Chemical	Na2B4O7·10H2O	Borax, anhydrous, powder	kg	1.65	
Reagent	Chemical	Na2CO3	Sodium carbonate (caustic soda), 50%, Na2CO3	kg	0.59	50%
Reagent	Chemical	Na2Si3O7	Sodium silicate at 48%, Na2Si3O7	kg	0.71	0%
Reagent	Chemical	Na2SiO3	Sodium silicate, spray powder 80%, Na2SiO3	kg	1.64	
Reagent	Chemical	Na2SO4	Sodium sulphate, powder, Na2SiO3	kg	0.47	
Reagent	Chemical	NaCl	Sodium chloride, powder, NaCl	kg	0.20	
Reagent	Chemical	NaClO	Sodium hypochlorite, 15% in H2O, NaClO	kg	0.92	
Reagent	Chemical	NaClO3	Sodium chlorate, powder, NaClO3	kg	3.23	
Reagent	Chemical	NaHCO3	Bicarbonate of soda, NaHCO3	kg	1.17	0%
Reagent	Chemical	NaHSO3	Sodium bisulfite, NaHSO3	kg	0.44	0%
Reagent	Chemical	NaOH	Soda, powder, NaOH	kg	0.46	
Reagent	Chemical	NaOH	Sodium hydroxide, 50% in H2O, production mix, NaOH	kg	1.12	
Reagent	Chemical	NH3	Ammonia, liquid, NH3	kg	2.11	
Reagent	Chemical	NH4Cl	Ammonium chloride, NH4Cl	kg	1.18	
Reagent	Chemical	NH4HCO3	Ammonium bicarbonate, NH4HCO3	kg	1.20	
Reagent	Chemical	NH4NO3	Ammonium nitrate (NH4NO3), by ton of nitrogen	kg	4.09	30%
Reagent	Chemical	O2	Oxygen, liquid	kg	0.41	
Reagent	Chemical	O3	Ozone, liquid	kg	8.01	
Reagent	Chemical	Organic	Lubricating oil	kg	1.07	
Reagent	Chemical	Organic	Palm oil	kg	2.93	
Reagent	Chemical	Organic	Soya oil	kg	1.70	
Reagent	Chemical	Other	Other chemical	kg	3.00	50%
Reagent	Chemical	Other	Soap	kg	1.75	
Reagent	Chemical	PCl3	Phosphorous chloride, PCl3	kg	3.39	
Reagent	Chemical	SF6	Sulphur hexafluoride, liquid, SF6	kg	120.00	
Reagent	Chemical	SO2	Sulphur dioxide, liquid, SO2	kg	0.44	
Reagent	Chemical	Solvent	White spirit	kg	0.95	
Reagent	Chemical	ZnO	Zinc oxide, ZnO	kg	2.91	
Reagent	Chemical	ZnS	Zinc sulphide, ZnS	kg	4.18	
Reagent	Chemical	ZrO2	Zirconium oxide, ZrO2	kg	4.05	
Reagent	Other	Activated carbon	AC coconut prod.	kg	1.43	
Reagent	Other	Activated carbon	AC coconut reac.	kg	0.65	
Reagent	Other	Activated carbon	AC mineral prod.	kg	5.27	
Reagent	Other	Activated carbon	AC mineral reac.	kg	2.46	
Reagent	Other	Activated carbon	AC mineral renew.	kg	8.38	
Reagent	Other	Activated carbon	AC wood prod.	kg	2.61	
Reagent	Other	Biocide	Biocide	kg	3.73	0%
Reagent	Other	CaCO3	Lime stone	kg	0.01	0%
Reagent	Other	CaO	Lime CaO	kg	0.15	50%
Reagent	Other	Fertilizer	Nitrogen	kg	4.62	30%
Reagent	Other	Fertilizer	Phosphorous	kg	2.70	0%
Reagent	Other	Other	Membrane cleaning	kg	3.99	0%
Reagent	Other	Polymer	Polymer	kg	2.20	0%
Reagent	Other	Resin	Resin prod. & activ. (kg)	kg	3.67	
Reagent	Other	Resin	Resin prod. & activ. (m3)	m3	3,116.67	

Reagent	Other	Resin	Resin regener. (kg)	kg	0.53	
Reagent	Other	Resin	Resin regener. (m3)	m3	447.33	
Reagent	Other	Sand	Microsand	kg	0.11	
Reagent	Other	TSP	STP	kg	5.81	0%
Transport	Freight	Air	AF ave. (km)	km	2.10	20%
Transport	Freight	Air	AF long (km)	km	1.20	20%
Transport	Freight	Air	AF long (t.km)	t.km	0.57	
Transport	Freight	Air	AF short (km)	km	3.36	20%
Transport	Freight	Air	AF short (t.km)	t.km	1.58	
Transport	Freight	Air	Air freight average (km)	km	2.22	20%
Transport	Freight	Air	Air freight average (t.km)	t.km	1.30	0%
Transport	Freight	Rail	Rail freight	t.km	0.03	
Transport	Freight	Rail	Train EU	t.km	0.02	50%
Transport	Freight	Road	RF bulk large	t.km	0.01	
Transport	Freight	Road	RF bulk small	t.km	0.01	
Transport	Freight	Road	RF roro large	t.km	0.02	
Transport	Freight	Road	RF roro small	t.km	0.06	
Transport	Freight	Road	RF tanker large	t.km	0.00	
Transport	Freight	Road	RF tanker small	t.km	0.04	
Transport	Freight	Road	RF truck 20t 1/2full	t.km	0.82	9%
Transport	Freight	Road	RF truck 20t 1/4full	t.km	1.52	9%
Transport	Freight	Road	RF truck 20t 3/4full	t.km	0.59	9%
Transport	Freight	Road	RF truck 20t full	t.km	0.47	9%
Transport	Freight	Road	RF truck 35t 1/2full	t.km	0.44	11%
Transport	Freight	Road	RF truck 35t 1/4full	t.km	0.81	11%
Transport	Freight	Road	RF truck 35t 3/4full	t.km	0.31	11%
Transport	Freight	Road	RF truck 35t full	t.km	0.25	11%
Transport	Freight	Road	Road freight average (km)	km	1.11	11%
Transport	Freight	Road	Road freight average (t.km)	t.km	0.70	11%
Transport	Freight	Water	SF transoceanic	t.km	0.01	
Transport	Freight	Water	Ship freight	t.km	0.01	20%
Transport	Trip	Air	Air trip average	km	0.49	20%
Transport	Trip	Air	AT long	km	0.19	20%
Transport	Trip	Air	AT long 1st	km	0.78	20%
Transport	Trip	Air	AT long 2nd	km	0.16	20%
Transport	Trip	Air	AT long bus.	km	0.81	20%
Transport	Trip	Air	AT short	km	0.24	20%
Transport	Trip	Air	AT short 2nd	km	0.19	20%
Transport	Trip	Air	AT short bus.	km	0.80	20%
Transport	Trip	Rail	Train trip	km	0.06	
Transport	Trip	Road	Road trip	km	0.21	
Transport	Trip	Road	Road trip average	km	0.19	20%
Transport	Trip	Road	RT diesel large	km	0.26	
Transport	Trip	Road	RT diesel medium	km	0.19	
Transport	Trip	Road	RT diesel small	km	0.15	
Transport	Trip	Road	RT hybrid large	km	0.22	
Transport	Trip	Road	RT hybrid medium	km	0.13	
Transport	Trip	Road	RT petrol large	km	0.30	
Transport	Trip	Road	RT petrol medium	km	0.22	
Transport	Trip	Road	RT petrol small	km	0.18	