



Ministry for the
Environment
Manatū Mo Te Taiao

Measuring Emissions: A Guide for Organisations

2019 SUMMARY OF EMISSION FACTORS

Using data from the 2016 calendar year

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Introduction

Organisations wishing to monitor and report their greenhouse gas (GHG) emissions for their New Zealand operations can use these GHG emission factors.

We present the emission factors in carbon dioxide equivalents (CO₂-e) using data and methods from the 2016 calendar year.

This Emission Factors Summary is part of a suite of documents that comprise *Measuring Emissions: A Guide for Organisations*, listed in figure 1.

Figure 1: Documents in *Measuring Emissions: A Guide for Organisations*

Measuring Emissions: A Guide for Organisations	
Quick Guide	The go-to document explaining changes since the last update, how to produce an inventory and what data you need to work out emissions from your activities
Detailed Guide	For users who need to know the data sources, methodologies, uncertainties and assumptions behind the emission factors for each emission source
Emission Factors Summary	Quick look up tables providing the main emission factors for each emission source
Emission Factors Workbook	As above but in excel format across multiple tabs
Emission Factors Flat File	Simple format for integration with software
Interactive Workbook	Use this spreadsheet to input your activity data, in order to work out your organisation's emissions and produce an inventory
Example GHG Inventory	Shows what a finished inventory might look like
Example GHG Report	Shows what a finished report might look like

THIS DOCUMENT

For further guidance on how to measure and report your organisation's GHG emissions please see the [Quick Guide](#). For understanding how these emission factors were derived, please see the [Detailed Guide](#).

Fuel emission factors

Table 1: Stationary combustion of fuels: Residential use

Residential fuel emission Source	Unit	kg CO ₂ -e/unit
Coal – default	kg	1.88
Coal – bituminous	kg	2.86
Coal – sub-bituminous	kg	2.15
Coal – lignite	kg	1.54

Table 2: Stationary combustion of fuels: Commercial use

Commercial fuel emission source	Unit	kg CO ₂ -e/unit
Coal – default	kg	1.77
Coal – bituminous	kg	2.66
Coal – sub-bituminous	kg	2.01
Coal – lignite	kg	1.43
Diesel	litre	2.66
LPG	kg	3.03
Heavy fuel oil	litre	3.03
Light fuel oil	litre	2.93
Natural gas	kWh	0.195
	GJ	54.1

Table 3: Stationary combustion of fuels: Industrial use

Industrial fuel emission source	Unit	kg CO ₂ -e/unit
Coal – default	kg	2.05
Coal – bituminous	kg	2.66
Coal – sub-bituminous	kg	2.01
Coal – lignite	kg	1.43
Diesel	litre	2.66
LPG	kg	3.02
Heavy fuel oil	litre	3.02
Light fuel oil	litre	2.92
Natural gas	kWh	0.194
	GJ	54.0

Table 4: Transport fuels

Transport fuel type	Unit	kg CO ₂ -e/unit
Regular petrol	litre	2.45
Premium petrol	litre	2.45
Petrol – default	litre	2.45
Diesel	litre	2.69
LPG	litre	1.64
Heavy fuel oil	litre	3.04
Light fuel oil	litre	2.94
Aviation fuel (Kerosene) / Jet A1	GJ	70.6
	litre	2.63
Aviation gasoline	GJ	68.3
	litre	2.31

Table 5: Biofuels

Biofuel type	Unit	kg CO ₂ -e/unit
Bioethanol	GJ	3.42
	litre	0.0000807
Biodiesel	GJ	3.42
	litre	0.000125
Wood – fireplaces	kg	0.0670
Wood – industrial	kg	0.0150

Table 6: Transmission and distribution losses for natural gas and electricity

Transmission and distribution losses source	Unit	kg CO ₂ -e/unit
Natural gas used	kWh	0.0228
	GJ	6.34
Electricity used		0.00740

Refrigerant use emission factors

Table 7: Global warming potentials of refrigerants (refrigerant use emission factors)

Industrial designation or common name	Chemical formula	Unit	GWPs in a 100-year period (kg CO ₂ -e)
<i>Substances controlled by the Montreal Protocol</i>			
CFC-11	CCl ₃ F	kg	4,750
CFC-12	CCl ₂ F ₂	kg	10,900
CFC-13	CClF ₃	kg	14,400
CFC-113	CCl ₂ FCClF ₂	kg	6,130

Industrial designation or common name	Chemical formula	Unit	GWPs in a 100-year period (kg CO ₂ -e)
CFC-114	CClF ₂ CClF ₂	kg	10,000
CFC-115	CClF ₂ CF ₃	kg	7,370
Halon-1301	CBrF ₃	kg	7,140
Halon-1211	CBrClF ₂	kg	1,890
Halon-2402	CBrF ₂ CBrF ₂	kg	1,640
Carbon tetrachloride	CCl ₄	kg	1,400
Methyl bromide	CH ₃ Br	kg	5
Methyl chloroform	CH ₃ CCl ₃	kg	146
HCFC-22	CHClF ₂	kg	1,810
HCFC-123	CHCl ₂ CF ₃	kg	77
HCFC-124	CHClFCF ₃	kg	609
HCFC-141b	CH ₃ CCl ₂ F	kg	725
HCFC-142b	CH ₃ CClF ₂	kg	2,310
HCFC-225ca	CHCl ₂ CF ₂ CF ₃	kg	122
HCFC-225cb	CHClFCF ₂ CClF ₂	kg	595
Hydrofluorocarbons			
HFC-23	CHF ₃	kg	14,800
HFC-32	CH ₂ F ₂	kg	675
HFC-125	CHF ₂ CF ₃	kg	3,500
HFC-134a	CH ₂ FCF ₃	kg	1,430
HFC-143a	CH ₃ CF ₃	kg	4,470
HFC-152a	CH ₃ CHF ₂	kg	124
HFC-227ea	CF ₃ CHFCF ₃	kg	3,220
HFC-236fa	CF ₃ CH ₂ CF ₃	kg	9,810
HFC-245fa	CHF ₂ CH ₂ CF ₃	kg	1030
HFC-365mfc	CH ₃ CF ₂ CH ₂ CF ₃	kg	794
HFC-43-10mee	CF ₃ CHFCHFCF ₂ CF ₃	kg	1,640
Perfluorinated compounds			
Sulphur hexafluoride	SF ₆	kg	22,800
Nitrogen trifluoride	NF ₃	kg	17,200
PFC-14	CF ₄	kg	7,390
PFC-116	C ₂ F ₆	kg	12,200
PFC-218	C ₃ F ₈	kg	8,830
PFC-318	c-C ₄ F ₈	kg	10,300
PFC-3-1-10	C ₄ F ₁₀	kg	8,860
PFC-4-1-12	C ₅ F ₁₂	kg	9,160
PFC-5-1-14	C ₆ F ₁₄	kg	9,300

Industrial designation or common name	Chemical formula	Unit	GWPs in a 100-year period (kg CO ₂ -e)
PFC-9-1-18	C ₁₀ F ₁₈	kg	>7,500
Trifluoromethyl sulphur pentafluoride	SF ₅ CF ₃	kg	17,700
Fluorinated ethers			
HFE-125	CHF ₂ OCF ₃	kg	14,900
HFE-134	CHF ₂ OCHF ₂	kg	6,320
HFE-143a	CH ₃ OCF ₃	kg	756
HCFE-235da2	CHF ₂ OCHClCF ₃	kg	350
HFE-245cb2	CH ₃ OCF ₂ CF ₃	kg	708
HFE-245fa2	CHF ₂ OCH ₂ CF ₃	kg	659
HFE-254cb2	CH ₃ OCF ₂ CHF ₂	kg	359
HFE-347mcc3	CH ₃ OCF ₂ CF ₂ CF ₃	kg	575
HFE-347pcf2	CHF ₂ CF ₂ OCH ₂ CF ₃	kg	580
HFE-356pcc3	CHF ₂ OCF ₂ CF ₂ OCHF ₂ CH ₃ OCF ₂ CF ₂ CHF ₂	kg	110
HFE-449sl (HFE-7100)	C ₄ F ₉ OCH ₃	kg	297
HFE-569sf2 (HFE-7200)	C ₄ F ₉ OC ₂ H ₅	kg	59
HFE-43-10pccc124 (H-Galden 1040x)	CHF ₂ OCF ₂ OC ₂ F ₄ OCHF ₂	kg	1,870
HFE-236ca12 (HG-10)	CHF ₂ OCF ₂ OCHF ₂	kg	2,800
HFE-338pcc13 (HG-01)	CHF ₂ OCF ₂ CF ₂ OCHF ₂	kg	1,500
Perfluoropolyethers			
PFPME	CF ₃ OCF(CF ₃) CF ₂ OCF ₂ OCF ₃	kg	10,300
Hydrocarbons and other compounds – Direct Effects			
Dimethylether	CH ₃ OCH ₃	kg	1
Methylene chloride	CH ₂ Cl ₂	kg	8.7
Methyl chloride	CH ₃ Cl	kg	13

Purchased electricity, heat and steam emission factors

Table 8: Purchased electricity

Emission source	Unit	kg CO ₂ -e/unit
Electricity used	kWh	0.0977

Travel emission factors

Table 9: Passenger vehicle fleet

Passenger vehicle travel emission source	Unit	Pre-2010 fleet	2010–2015 fleet	Post-2015 fleet	
		kg CO ₂ -e/unit	kg CO ₂ -e/unit	kg CO ₂ -e/unit	
Petrol vehicle	<1350 cc	km	0.215	0.196	0.186
	1350– <1600 cc	km	0.206	0.188	0.179
	1600– <2000 cc	km	0.248	0.207	0.196
	2000– <3000 cc	km	0.268	0.234	0.222
	≥3000 cc	km	0.334	0.277	0.262
Diesel vehicle	<1350 cc	km	0.215	0.197	0.189
	1350– <1600 cc	km	0.207	0.190	0.182
	1600– <2000 cc	km	0.219	0.201	0.193
	2000– <3000 cc	km	0.270	0.247	0.237
	≥3000 cc	km	0.300	0.274	0.263
Petrol hybrid vehicle	<1350 cc	km	0.170	0.154	0.142
	1350– <1600 cc	km	0.163	0.148	0.136
	1600– <2000 cc	km	0.178	0.162	0.149
	2000– <3000 cc	km	0.202	0.183	0.169
	≥3000 cc	km	0.239	0.216	0.200
Diesel hybrid vehicle	<1350 cc	km	0.193	0.176	0.166
	1350– <1600 cc	km	0.186	0.169	0.159
	1600– <2000 cc	km	0.197	0.179	0.169
	2000– <3000 cc	km	0.242	0.220	0.208
	≥3000 cc	km	0.268	0.244	0.230
Petrol plug-in hybrid electric vehicle (PHEV) – petrol consumption	<1350 cc	km		0.080	0.074
	1350– <1600 cc	km		0.077	0.071
	1600– <2000 cc	km		0.085	0.078
	2000– <3000 cc	km		0.096	0.088
	≥3000 cc	km		0.113	0.105
	<1350 cc	km		0.010	0.010
	1350– <1600 cc	km		0.010	0.009

Passenger vehicle travel emission source		Unit	Pre-2010 fleet	2010–2015 fleet	Post-2015 fleet
			kg CO ₂ -e/unit	kg CO ₂ -e/unit	kg CO ₂ -e/unit
Petrol plug-in hybrid electric vehicle (PHEV) – electricity consumption	1600– <2000 cc	km		0.010	0.010
	2000– <3000 cc	km		0.012	0.011
	≥3000 cc	km		0.014	0.014
Diesel plug-in hybrid electric vehicle (PHEV) – diesel consumption	<1350 cc	km		0.092	0.087
	1350– <1600 cc	km		0.089	0.083
	1600– <2000 cc	km		0.094	0.088
	2000– <3000 cc	km		0.115	0.109
	≥3000 cc	km		0.128	0.120
Diesel plug-in hybrid electric vehicle (PHEV) – electricity consumption	<1350 cc	km		0.010	0.010
	1350– <1600 cc	km		0.010	0.009
	1600– <2000 cc	km		0.010	0.010
	2000– <3000 cc	km		0.012	0.011
	≥3000 cc	km		0.014	0.014
Electric vehicle	Very small	km		0.021	0.020
	Small	km		0.020	0.019
	Medium	km		0.022	0.021
	Large	km		0.025	0.024
	Very large	km		0.029	0.028
Motorcycle	<60 cc, petrol	km	0.066	0.060	0.058
	≥60 cc, petrol	km	0.121	0.113	0.058
	<60 cc, electricity	km		0.005	0.005
	≥60 cc, electricity	km		0.009	0.005

Table 10: Default car emission factors

Default car travel emission source		Unit	kg CO ₂ -e/unit
Private car default	Petrol	km	0.268
	Diesel	km	0.270
	Petrol hybrid	km	0.202
	Diesel hybrid	km	0.242
	Petrol plug-in hybrid (petrol consumption)	km	0.096
	Petrol plug-in hybrid (electricity consumption)	kWh	0.012
	Diesel plug-in hybrid (diesel consumption)	km	0.115
	Diesel plug-in hybrid (electricity consumption)	kWh	0.012
	Electric	km	0.025

Table 11: Default rental car emission factors

Default rental car travel emission source		Unit	kg CO ₂ -e/unit
Rental car default	Petrol	km	0.207
	Diesel	km	0.201
	Petrol hybrid	km	0.162
	Diesel hybrid	km	0.179
	Petrol plug-in hybrid (petrol consumption)	km	0.085
	Petrol plug-in hybrid (electricity consumption)	kWh	0.020
	Diesel plug-in hybrid (diesel consumption)	km	0.094
	Diesel plug-in hybrid (electricity consumption)	kWh	0.020
	Electric	km	0.022

Table 12: Taxi travel

Taxi travel emission source		Unit	kg CO ₂ -e/unit
Taxi travel	Distance travelled	km	0.224
	Dollars spent	\$	0.075

Table 13: Public transport

Public transport emission source		Unit	kg CO ₂ -e/unit
Diesel bus	<7,500 kg	km	0.566
	<12,000 kg	km	0.784
	≥12,000 kg	km	1.087
Diesel hybrid bus	<7,500 kg	km	0.401
	<12,000 kg	km	0.555
	≥12,000 kg	km	0.769
Electric bus	<7,500 kg	km	0.056
	<12,000 kg	km	0.078
	≥12,000 kg	km	0.108

Table 14: Air travel (domestic)

Emission source	Unit	Without radiative forcing	With radiative forcing
		kg CO ₂ -e/unit	kg CO ₂ -e/unit
National average	pkm	0.130	0.242
Jet aircraft	pkm	0.072	0.134
Medium aircraft	pkm	0.114	0.213
Small aircraft	pkm	0.353	0.659

For calculating international air travel emissions, use the ICAO calculator (see [Quick Guide](#), section 4.4.3). If you prefer not to use this, emission factors for international travel can be found in the [Emission Factors Workbook](#).

Table 15: Accommodation

Country stayed in	Unit	kg CO ₂ -e/unit
Argentina	Room per night	57.3
Australia	Room per night	65.1
Austria	Room per night	19.0
Belgium	Room per night	13.9
Brazil	Room per night	14.1
Canada	Room per night	19.6
Caribbean Region	Room per night	64.0
Chile	Room per night	56.0
China	Room per night	72.3
China (Hong Kong)	Room per night	93.3
Colombia	Room per night	15.5
Costa Rica	Room per night	16.1
Czech Republic	Room per night	29.7
Egypt	Room per night	67.8
France	Room per night	6.6
Germany	Room per night	20.8
India	Room per night	103.1
Indonesia	Room per night	126.7
Ireland	Room per night	30.0
Italy	Room per night	24.9
Japan	Room per night	75.5
Jordan	Room per night	98.3
Malaysia	Room per night	92.6
Mexico	Room per night	30.3
Netherlands	Room per night	21.7
New Zealand	Room per night	12.3
Panama	Room per night	31.1
Poland	Room per night	53.8
Portugal	Room per night	19.2
Qatar	Room per night	140.9
Russian Federation	Room per night	38.7
Saudi Arabia	Room per night	108.5
Singapore	Room per night	48.4

Country stayed in	Unit	kg CO ₂ -e/unit
South Africa	Room per night	62.2
South Korea	Room per night	80.3
Spain	Room per night	23.5
Switzerland	Room per night	8.9
Thailand	Room per night	64.7
Turkey	Room per night	56.6
United Arab Emirates	Room per night	117.0
United Kingdom	Room per night	26.4
United States	Room per night	25.6
Vietnam	Room per night	63.5

Freight transport emission factors

Table 16: Road freight: Light commercial vehicles

Light commercial vehicle travel emission source			Pre-2010	2010–2015	Post-2015
	Unit		kg CO ₂ -e	kg CO ₂ -e	kg CO ₂ -e
Petrol	<1350 cc	km	0.215	0.196	0.186
	1350– <1600 cc	km	0.206	0.188	0.179
	1600– <2000 cc	km	0.269	0.246	0.234
	2000– <3000 cc	km	0.262	0.239	0.227
	≥3000 cc	km	0.303	0.276	0.263
Diesel	<1350 cc	km	0.215	0.267	0.189
	1350– <1600 cc	km	0.207	0.190	0.182
	1600– <2000 cc	km	0.276	0.252	0.242
	2000– <3000 cc	km	0.296	0.271	0.259
	≥3000 cc	km	0.183	0.274	0.263
Petrol hybrid	<1350 cc	km	0.170	0.211	0.146
	1350– <1600 cc	km	0.163	0.149	0.140
	1600– <2000 cc	km	0.213	0.194	0.183
	2000– <3000 cc	km	0.207	0.189	0.178
	≥3000 cc	km	0.239	0.218	0.206
Diesel hybrid	<1350 cc	km	0.193	0.177	0.170
	1350– <1600 cc	km	0.186	0.170	0.163
	1600– <2000 cc	km	0.247	0.226	0.218
	2000– <3000 cc	km	0.265	0.243	0.233
	≥3000 cc	km	0.268	0.246	0.236
	<1350 cc	km		0.081	0.077
	1350– <1600 cc	km		0.078	0.073

Light commercial vehicle travel emission source		Unit	Pre-2010 kg CO ₂ -e	2010–2015 kg CO ₂ -e	Post-2015 kg CO ₂ -e
Petrol plug-in hybrid electric vehicle (PHEV) – petrol consumption	1600– <2000 cc	km		0.102	0.096
	2000– <3000 cc	km		0.099	0.093
	≥3000 cc	km		0.114	0.108
Petrol plug-in hybrid electric vehicle (PHEV) – electricity consumption	<1350 cc	km		0.010	0.010
	1350– <1600 cc	km		0.010	0.009
	1600– <2000 cc	km		0.010	0.010
	2000– <3000 cc	km		0.012	0.012
	≥3000 cc	km		0.014	0.012
Diesel plug-in hybrid electric vehicle (PHEV) – diesel consumption	<1350 cc	km		0.093	0.089
	1350– <1600 cc	km		0.089	0.086
	1600– <2000 cc	km		0.119	0.114
	2000– <3000 cc	km		0.127	0.122
	≥3000 cc	km		0.129	0.124
Diesel plug-in hybrid electric vehicle (PHEV) – electricity consumption	<1350 cc	km		0.010	0.010
	1350– <1600 cc	km		0.010	0.009
	1600– <2000 cc	km		0.010	0.010
	2000– <3000 cc	km		0.012	0.012
	≥3000 cc	km		0.014	0.014
Electricity: BEV (battery electric vehicle)	Very small	km		0.021	0.020
	Small	km		0.020	0.019
	Medium	km		0.022	0.021
	Large	km		0.025	0.024
	Very large	km		0.029	0.029

Table 17: Road freight: Default light commercial vehicles

Emission source	Unit	kg CO ₂ -e/unit
Petrol	km	0.262
Diesel	km	0.296
Petrol hybrid	km	0.207
Diesel hybrid	km	0.265

Table 18: Road freight: Heavy goods vehicles

Emission source		Unit	Pre-2010 fleet kg CO ₂ -e	2010–2015 fleet kg CO ₂ -e	Post-2015 fleet kg CO ₂ -e
HGV diesel	<5,000 kg	km	0.451	0.428	0.423
	5,000– <7,500 kg	km	0.455	0.431	0.426
	7,500– <10,000 kg	km	0.630	0.597	0.591
	10,000– <12,000 kg	km	0.706	0.669	0.661
	12,000– <15,000 kg	km	0.873	0.828	0.818
	15,000– <20,000 kg	km	0.944	0.897	0.897
	20,000– <25,000 kg	km	1.253	1.191	1.191
	25,000– <30,000 kg	km	1.384	1.315	1.315
	≥30,000 kg	km	1.435	1.366	1.364
HGV diesel hybrid	<5,000 kg	km	0.382	0.346	0.346
	5,000– <7,500 kg	km	0.367	0.349	0.348
	7,500– <10,000 kg	km	0.508	0.483	0.483
	10,000– <12,000 kg	km	0.569	0.541	0.541
	12,000– <15,000 kg	km	0.704	0.670	0.669
	15,000– <20,000 kg	km	0.858	0.816	0.815
	20,000– <25,000 kg	km	1.139	1.084	1.082
	25,000– <30,000 kg	km	1.301	1.238	1.236
	≥30,000 kg	km	1.349	1.284	1.282
HGV BEV (battery electric vehicle)	<5,000 kg	km		0.044	0.043
	5,000– <7,500 kg	km		0.044	0.043
	7,500– <10,000 kg	km		0.061	0.060
	10,000– <12,000 kg	km		0.068	0.067
	12,000– <15,000 kg	km		0.085	0.083

Table 19: Road freight: Default emission factors for heavy goods vehicles

Emission source	Unit	kg CO ₂ -e
HGV diesel	km	0.455
HGV diesel hybrid	km	0.367

Table 20: Freightings goods in New Zealand

Emission source	Unit	kg CO ₂ -e	
Road	Road freight by truck	tkm	0.136
Rail	Rail freight	tkm	0.028
Coastal shipping	Container freight	tkm	0.045
	Oil products	tkm	0.016
	Other bulk coastal shipping	tkm	0.030

Table 21: Air freight

Emission source	Unit	Without radiative forcing	With radiative forcing
		kg CO ₂ -e	kg CO ₂ -e
Domestic air freight	tkm	3.085	5.833
Short haul air freight	tkm	1.029	1.947
Long haul air freight	tkm	0.651	1.232

Table 22: International shipping

Emission source	Unit	kg CO ₂ -e	
Bulk carrier	200,000+ deadweight tonnes (dwt)	tkm	0.003
	100,000–199,999 dwt	tkm	0.003
	60,000–99,999 dwt	tkm	0.004
	35,000–59,999 dwt	tkm	0.006
	10,000–34,999 dwt	tkm	0.008
	0–9,999 dwt	tkm	0.030
	Average	tkm	0.006
General cargo	10,000+ dwt	tkm	0.012
	5,000–9,999 dwt	tkm	0.016
	0–4,999 dwt	tkm	0.014
	10,000+ dwt 100+ TEU	tkm	0.011
	5,000–9,999 dwt 100+ TEU	tkm	0.018
	0–4,999 dwt 100+ TEU	tkm	0.020
	Average	tkm	0.012
Container ship	8,000+ twenty-foot equivalent unit (TEU)	tkm	0.013
	5,000–7,999 TEU	tkm	0.017
	3,000–4,999 TEU	tkm	0.017
	2,000–2,999 TEU	tkm	0.020
	1,000–1,999 TEU	tkm	0.033
	0–999 TEU	tkm	0.037
	Average	tkm	0.020
Vehicle transport	4,000+ car equivalent unit (CEU)	tkm	0.032
	0–3,999 CEU	tkm	0.058
	Average	tkm	0.039
RoRo (Roll-on, Roll-off) ferry	2,000+ lanemetre (LM)	tkm	0.050
	0–1,999 LM	tkm	0.061
	Average	tkm	0.052
Refrigerated cargo	All dwt	tkm	0.013

Water supply and wastewater treatment emission factors

Table 23: Water supply

Emission source	Unit	kg CO ₂ -e
Water supply	m ³	0.0313
	Per capita	4.07

Table 24: Wastewater treatment

Emission source		Unit	kg CO ₂ -e/unit
Domestic wastewater	Wastewater Treatment Plants	m ³ water supplied	0.447
		Per capita	48.5
	Septic tanks	Per capita	0.202
Industrial wastewater	Meat (excluding poultry)	tonne of kills	47.5
	Poultry	tonne of kills	47.0
	Pulp and paper	tonne of product	10.5
	Wine	tonne of crushed grapes	5.17
	Dairy processing	m ³ of milk	0.119

Materials and waste emission factors

Table 25: Construction material

Emission source		Unit	kg CO ₂ -e/unit
Concrete	Default	kg	0.148
	17.5 megapascals (MPa)	kg	0.109
	20 MPa	kg	0.113
	25 MPa	kg	0.123
	30 MPa	kg	0.133
	35 MPa	kg	0.149
	40 MPa	kg	0.172
	45 MPa	kg	0.181
	50 MPa	kg	0.203
	Steel	Structural, columns and beams	kg
Aluminium	Default	kg	11.8

Table 26: Waste disposal with and without landfill gas recovery (LFGR)

Emission source		Unit	With LFGR kg CO ₂ -e/unit	Without LFGR kg CO ₂ -e/unit
Waste (known composition)	Food	kg	0.233	1.13
	Garden	kg	0.310	1.50
	Paper	kg	0.620	3.00
	Wood	kg	0.667	3.23
	Textile	kg	0.372	1.80
	Nappies	kg	0.372	1.80
	Other (Inert)	kg	n/a	n/a
Waste (unknown composition)	General waste	kg	0.242	1.17
	Office waste	kg	0.381	1.84

Table 27: Composting

Emission source	Unit	kg CO ₂ -e/unit
Composting	kg	0.172

Agriculture, forestry and other land-use emission factors

Table 28: Forestry

Emission source		Unit	kg CO ₂ -e/unit
Planted forests	All	ha	-33,807
Natural forests	Regenerating natural forest	ha	-5,097
	Tall natural forest	ha	0

Table 29: Land-use change – harvest and deforestation

Emission source		Unit	kg CO ₂ -e/unit
Planted forests	Harvest and deforestation	ha	946,605
Natural forests	Harvest and deforestation	ha	848,650

Table 30: Agriculture

Emission source		Unit	kg CO ₂ -e/unit
Enteric fermentation	Dairy cattle	per head	2060
	Non-dairy cattle	per head	1500
	Sheep	per head	300
	Deer	per head	560
Manure management	Dairy cattle	per head	150
	Non-dairy cattle	per head	19.9
	Sheep	per head	3.15
	Deer	per head	6.59
Fertiliser use	Non-urea nitrogen fertiliser	kg	5.40
	Urea nitrogen fertiliser not coated with urease inhibitor	kg	5.07
	Urea nitrogen fertiliser coated with urease inhibitor	kg	4.86
	Limestone	kg	0.440
	Dolomite	kg	0.477
Agricultural soils	Dairy cattle	per head	514
	Non-dairy cattle	per head	321
	Sheep	per head	71.5
	Deer	per head	128