



Measurabl GHG Calculation Methodology

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Background

Measurabl displays greenhouse gas (GHG) emission metrics for sites in the “Portfolio/Subgroup Trends” tab and in the app’s GRESB and CDP reports. Measurabl reports GHG emissions in metric tons of CO₂ equivalent (MT CO₂e). Measurabl uses the 100-year Global Warming Potential (GWP) values from the IPCC (Intergovernmental Panel on Climate Change) Fifth Assessment Report to calculate CO₂e (see Appendix 2). Measurabl uses industry standard emissions factors across fuels and global regions, and these emissions factors include lifecycle emissions from energy generation (for example: electricity emissions account for transmission/distribution losses).

Measurabl calculates both scope 1 and scope 2 emissions based on actual usage data from meters marked “Paid By Landlord”. For the app’s CDP report only, estimates are applied for scope 2 emissions where actual data is not available. For scope 3 emissions, Measurabl



calculates only tenant-related emissions based on actual data from meters marked as tenant paid, following the same methodology used to calculate scope 1 and scope 2 emissions.

The “Portfolio/Subgroup Trends” page follows logic from GRESB and CDP by zeroing out emissions from sites for time periods after their “Sold Date” and before their “Bought Date”. So if you have a site that was sold on 12/31/2017 or bought on 1/1/2019, its carbon emissions (and usage) for 2018 will appear as 0, even if the site has complete utility data entered for that year. The app does calculate emissions for sites undergoing new construction or major renovation.

Scope 1 Emissions

Measurabl calculates scope 1 emissions based on actual energy data entered under the “Fuel” category, which includes Natural Gas, Diesel, Fuel Oils #2, #5, and #6, Propane, Compressed Natural Gas, Biodiesel (B100 and B20), and Renewable Diesel.

Measurabl first calculates the total usage of each fuel. The thermal units for each fuel (as entered by the user when each meter was created) are converted into a common unit: megawatt hours (MWh). To do this, the app uses the thermal conversion factors in Appendix 1.

Measurabl then multiplies the usage (in MWh) of each fuel by its emissions factor (listed in Appendix 3). The emissions for all scope 1 fuel types consumed at the site during the evaluation period are summed, and the result is displayed in the app as “Scope 1 Emissions.” Reminder: this total does not include emissions from fuel meters marked as tenant paid.

Example scope 1 emissions calculation:

Fuel Type	Usage (kBTU)	Conversion Factor (kBTU to MWh)	Usage (MWh)	Emissions factor (MT CO ₂ e per MWh)	Emissions (MT CO ₂ e)
Natural Gas	296,448	.0002930710387	86.88032328	0.18159	15.78



Scope 2 Emissions

Measurabl calculates scope 2 emissions as a sum of emissions from energy usage entered under the “Electric” and “District” categories.

Electric

Measurabl assigns zero emissions for electric meters that are entered as “On-site Renewable” or “Off-site Renewable”.

Nonrenewable electric meters are assigned an emissions factor based on the country designated for their site. Countries outside the U.S. and Canada have country-wide emissions factors for electricity. The U.S. has different emissions factors for each eGRID subregion (learn more about eGRID subregions [here](#)). Sites in the U.S. are mapped to eGRID subregions by their zip code, and you can learn more about the mapping [here](#). Canada has different emissions factors for each province. All of the current emissions factors are listed in Appendix 3.

Measurabl sums nonrenewable electric usage across meters for the evaluation period. Depending on the emissions factor used, the summed electricity may be converted to MWh.

Measurabl then multiplies the total nonrenewable electric usage by the region-specific emissions factor. Nonrenewable electricity usage emissions for sites outside the U.S. (which are often given in kilograms based on their emissions factors) are then converted to MT CO₂e.

Example electric emissions calculation

Electric Usage (kWh)	eGRID subregion	Emissions Factor (MT CO ₂ e per kWh)	Emissions (MT CO ₂ e)
1,038,764.51	RFC West	.00056783	589.84



District

Measurabl uses the same process to calculate scope 2 emissions from energy usage entered under the “District” category as is used to calculate scope 1 emissions from “Fuel” energy usage. “District” energy includes steam, hot water, and chilled water (from various generation methods).

Measurabl totals usage for each district emissions source during the evaluation period, then converts each total to a common unit of MWh. Measurabl then multiplies each usage by its emissions factor, then sums the emissions, in MT CO₂e.

Example district emissions calculation

Fuel Type	Usage (kBtu)	Conversion Factor (kBtu to MWh)	Usage (MWh)	Emissions Factor (MT CO ₂ e per MWh)	Emissions (MT CO ₂ e)
Steam	9,179,481	0.0002930710387	2,690.24	.2265	609.34

Scope 2 Emissions CDP Calculations

Per CDP guidelines, there are some additional steps Measurabl uses to calculate scope 2 emissions within the “Carbon Emissions” tab of the app’s CDP report.

Location-based and Market-based methods

CDP requires organizations to report scope 2 carbon emissions from electricity using two different methods.

The Location-based method assigns the same, regional grid emission factors for all purchased electricity.

Let’s say you have one site, in Washington, DC, that used 100,000 kWh of grid electricity and 100,000 kWh of offsite renewable electricity. Under the location-based method, all 200,000 kWh are multiplied by the regional grid emissions factor.



The Market-based method assigns different emissions factors depending on the source of the electricity. Renewable electricity is assigned zero emissions. For certain utility providers, the app can assign provider-specific emission factors, rather than regional grid emission factors.

To revisit the site above, the 100,000 kWh of offsite renewable electricity will contribute 0 carbon emissions, while the 100,000 kWh of grid electricity will be multiplied by the utility provider's (Pepco) specific emissions factor, rather than the regional grid emissions factor. The site's market-based emissions will be substantially lower than its location-based emissions because the market-based method assumes no emissions from the 100,000 kWh of renewable electricity.

Scope 2 Estimations

Method 1: If a site has actual usage data for the reporting period but some months (fewer than six) are missing data, the estimate for the missing months is the average of the actual months. If January has no data, average monthly usage from February-December is used as an estimate.

Method 2 (if method 1 cannot be used): If a month with no actual data has prior year usage, that prior year usage becomes the estimate. If January 2018 has no actual data, January 2017 actual usage (if entered) is the estimate.

If a site is missing more than six months of electricity data during the reporting period, the app estimates energy use by multiplying the common floor area by an average energy intensity figure. That intensity figure comes from the [CBECS 2012 survey](#) for the specific property type. For example: offices have a different energy intensity figure used for estimates than hotels. Estimates are only applied for periods where the site was owned/leased. If a site has no 2018 data, but was sold on 6-30-2018, only six months of estimated usage/emissions will be applied.

-Leased sites and owned sites with no common area that have fewer than six months of electricity data have estimates applied for the whole site's floor area.

-Owned sites with common area and fewer than six months of electricity data have estimates applied only for the site's common area.

-Measurabl uses the property type with the majority of the site's floor area when applying these energy use estimates. The app does not prorate estimated energy use based on the percent of total floor area of each property type in a mixed use site.

For example: if a site contains 90 percent office space with 10 percent data center space, the app will only use the CBECS 2012 figure for office when estimating common area energy use. If you need emissions estimates for each property type within a mixed use site, you'll need to split each property type out as its own separate site within Measurabl. The app then calculates



emissions by multiplying the estimated energy use (however it was derived) by the appropriate emissions factors.

Appendix 1: Energy and Water Conversion Factors

Multiplier to get MWH	Meter Type in Measurabl	Units	Meter Type
0.0007714	District	KILOGRAM	NULL
0.3499	District	KLBS. (THOUSAND POUNDS)	NULL
0.0002930710387	District	KBTU (THOUSAND BTU)	NULL
1	District	MWH (MILLION WATT-HOURS)	NULL
0.001	District	KWH (THOUSAND WATT-HOURS)	NULL
0.2930710387	District	MBTU (MILLION BTU)	NULL
349.9	District	MLBS. (MILLION POUNDS)	NULL
0.0003499	District	POUNDS	NULL
0.02931	District	THERMS	NULL
0.003518	District	TON HOURS	NULL
0.27777778	District	GJ	NULL
0.27777778	Electric	GJ	NULL
0.0002930710387	Electric	KBTU (THOUSAND BTU)	NULL
0.001	Electric	KWH (THOUSAND WATT-HOURS)	NULL
0.001	Electric	KWH	NULL
0.2930710387	Electric	MBTU (MILLION BTU)	NULL
1	Electric	MWH (MILLION WATT-HOURS)	NULL
1	Electric	MWH	NULL
0.0299	Fuel	CCF	NULL
0.0299	Fuel	CCF (HUNDRED CUBIC FEET)	NULL
0.000299	Fuel	CF (CUBIC FEET)	NULL
0.299	Fuel	KCF (THOUSAND CUBIC FEET)	NULL
299	Fuel	MCF (MILLION CUBIC FEET)	NULL
299	Fuel	MCF(MILLION CUBIC FEET)	NULL

0.01055	Fuel	CUBIC METERS	NULL
0.01055	Fuel	CM	NULL
0.01055	Fuel	CM (CUBIC METERS)	NULL
0.27777778	Fuel	GJ	NULL
1	Fuel	MWH (MILLION WATT-HOURS)	NULL
0.001	Fuel	KWH (THOUSAND WATT-HOURS)	NULL
6.74	Fuel	CORDS	NULL
0.0002930710387	Fuel	KBTU (THOUSAND BTU)	NULL
0.2930710387	Fuel	MBTU (MILLION BTU)	NULL
0.029310	Fuel	THERMS	NULL
0.026816	Fuel	GALLONS (US)	Propane
0.026816	Fuel	GALLONS	Propane
0.032205	Fuel	GALLONS (UK)	Propane
0.040737	Fuel	GALLONS (US)	Diesel
0.040737	Fuel	GALLONS	Diesel
0.048923	Fuel	GALLONS (UK)	Diesel
0.039569	Fuel	GALLONS (US)	Kerosene
0.039569	Fuel	GALLONS	Kerosene
0.04752	Fuel	GALLONS (UK)	Kerosene
0.040272	Fuel	GALLONS (US)	Fuel Oil No 1
0.040272	Fuel	GALLONS	Fuel Oil No 1
0.048365	Fuel	GALLONS (UK)	Fuel Oil No 1
0.040737	Fuel	GALLONS (US)	Fuel Oil No 2
0.040737	Fuel	GALLONS	Fuel Oil No 2
0.048923	Fuel	GALLONS (UK)	Fuel Oil No 2
0.042342	Fuel	GALLONS (US)	Fuel Oil No 4
0.042342	Fuel	GALLONS	Fuel Oil No 4
0.05085	Fuel	GALLONS (UK)	Fuel Oil No 4
0.044137	Fuel	GALLONS	Fuel Oil No 5 or 6
0.044137	Fuel	GALLONS (US)	Fuel Oil No 5 or 6

0.053005	Fuel	GALLONS (UK)	Fuel Oil No 5 or 6
0.00708	Fuel	Liters	Propane
0.0107616	Fuel	Liters	Diesel
0.01045	Fuel	Liters	Kerosene
0.01064	Fuel	Liters	Fuel Oil No 1
0.0107616	Fuel	Liters	Fuel Oil No 2
0.01119	Fuel	Liters	Fuel Oil No 4
0.01166	Fuel	Liters	Fuel Oil No 5 or 6
2.831685	Water	CCF (HUNDRED CUBIC FEET)	NULL
0.02831685	Water	CF (CUBIC FEET)	NULL
1	Water	CM	NULL
1	Water	CM (CUBIC METERS)	NULL
1	Water	CUBIC METERS	NULL
0.004546092	Water	GALLONS (UK)	NULL
0.003785412	Water	GALLONS (US)	NULL
0.003785412	Water	GALLONS	NULL
28.31685	Water	KCF (THOUSAND CUBIC FEET)	NULL
1000	Water	KCM	NULL
1000	Water	KCM (THOUSAND CUBIC METERS)	NULL
4.546092	Water	KGAL (THOUSAND GALLONS) (UK)	NULL
3.785412	Water	KGAL (THOUSAND GALLONS) (US)	NULL
3.785412	Water	KGAL (THOUSAND GALLONS)	NULL
0.3785412	Water	CGAL (HUNDRED GALLONS) (US)	NULL
0.3785412	Water	CGAL (HUNDRED GALLONS)	NULL
0.4546092	Water	CGAL (HUNDRED GALLONS) (UK)	NULL
0.001	Water	LITERS	NULL
1	Water	KILOLITERS	NULL
28316.85	Water	MCF(MILLION CUBIC FEET)	NULL
28316.85	Water	MCF (MILLION CUBIC FEET)	NULL

4546.092	Water	MGAL (MILLION GALLONS) (UK)	NULL
3785.412	Water	MGAL (MILLION GALLONS) (US)	NULL
3785.412	Water	MGAL (MILLION GALLONS)	NULL
3785.412	Water	MILLION GALLONS PER DAY	NULL
0.0003009839567	Fuel	CF (CUBIC FEET)	Compressed Natural Gas (CNG)
0.02931	Fuel	THERMS	Compressed Natural Gas (CNG)
0.040737	Fuel	GALLONS (US)	Renewable Diesel
0.040737	Fuel	GALLONS	Renewable Diesel
0.048923	Fuel	GALLONS (UK)	Renewable Diesel
0.0107616	Fuel	Liters	Renewable Diesel
0.03809923503	Fuel	GALLONS (US)	Biodiesel (B100)
0.03809923503	Fuel	GALLONS	Biodiesel (B100)
0.04575518265	Fuel	GALLONS (UK)	Biodiesel (B100)
0.01006477472	Fuel	Liters	Biodiesel (B100)
0.04020944701	Fuel	GALLONS (US)	Biodiesel (B20)
0.04020944701	Fuel	GALLONS	Biodiesel (B20)
0.04828943653	Fuel	GALLONS (UK)	Biodiesel (B20)
0.01062223494	Fuel	Liters	Biodiesel (B20)

0.02696253556	Fuel	GALLONS (US)	Liquefied Petroleum Gas (LPG)
0.02696253556	Fuel	GALLONS	Liquefied Petroleum Gas (LPG)
0.0323805908	Fuel	GALLONS (UK)	Liquefied Petroleum Gas (LPG)
0.007122763647	Fuel	Liters	Liquefied Petroleum Gas (LPG)
0.0234456831	Fuel	GALLONS (US)	Liquefied Natural Gas (LNG)
0.0234456831	Fuel	GALLONS	Liquefied Natural Gas (LNG)
0.02815703547	Fuel	GALLONS (UK)	Liquefied Natural Gas (LNG)
0.006193707519	Fuel	Liters	Liquefied Natural Gas (LNG)

Appendix 2: Global Warming Potential Values

Greenhouse Gas	GWP (CO ₂ e)	Source
Carbon Dioxide (CO ₂)	1	IPCC Fifth Assessment Report (AR5)
Methane (CH ₄)	28	IPCC Fifth Assessment Report (AR5)
Nitrous Oxide (N ₂ O)	265	IPCC Fifth Assessment Report (AR5)



Appendix 3: Measurabl Emissions Factors 2019

Fuel/Material/Energy	Emission Factor	Unit	Reference
Steam/District (US)	0.2265	metric tonnes CO ₂ e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Steam/District (Canada + Intl)	0.3021	metric tonnes CO ₂ e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Hot Water (US)	66.4	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Electric-driven Chiller (US)	52.7	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Absorption Chiller using Natural Gas (US)	73.89	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Engine-driven Chiller using Natural Gas (US)	49.31	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Hot Water (Canada)	88.54	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Electric-driven Chiller (Canada)	17.19	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Absorption Chiller using Natural Gas (Canada)	73.86	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Chilled Water: Engine-driven Chiller using Natural Gas (Canada)	49.29	kg Co ₂ e per MBtu (Million BTU)	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Coke (US)	.3904172876	metric tonnes CO ₂ e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Coal (anthracite US)	.3563641104	metric tonnes CO ₂ e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager



Coal (bituminous US)	.3208437122	metric tonnes CO2e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Wood (US)	.3243240971	metric tonnes CO2e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Kerosene (US)	.2650893119	metric tonnes CO2e per MWh	The US Environmental Protection Agency: - ENERGY STAR Portfolio Manager
Natural Gas	0.18159	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Compressed Natural Gas (CNG)	0.18141	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Diesel	0.25386	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Fuel Oil #2	0.25386	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Fuel Oil #5 or #6	.23336429752 815	metric tonnes CO2e per MWh	The US Environmental Protection Agency Center for Corporate Climate Leadership
Propane	0.21602	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Liquefied Petroleum Gas (LPG)	0.21206	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Liquefied Natural Gas (LNG)	0.19077	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Biodiesel (B100)	0.25345	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Biodiesel (B20)	0.25378	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Renewable Diesel	0.25386	metric tonnes CO2e per MWh	2018 Climate Registry Default Emission Factors
Vehicle fuel (gas)	0.008871238	metric tonnes CO2e per gallon	World Resources Institute (2008). GHG Protocol tool for mobile combustion. Version 2.2
Vehicle fuel (diesel)	0.010156986	metric tonnes CO2e per gallon	World Resources Institute (2008). GHG Protocol tool for mobile combustion. Version 2.2
City of Palo Alto	0	metric tonnes CO2e per KWH	Supplier website



PEPCO	0.00052	metric tonnes CO2e per KWH	Supplier website
Baltimore Gas and Electric	0.000503	metric tonnes CO2e per KWH	Supplier website
ASCC Alaska Grid	0.00048882	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
ASCC Miscellaneous	0.00022905	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
ERCOT All	0.00046016	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
FRCC All	0.00046118	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
HICC Miscellaneous	0.00052570	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
HICC Oahu	0.00076015	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
MRO East	0.00076201	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
MRO West	0.00056594	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
NPCC Long Island	0.00053815	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
NPCC New England	0.00025583	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
NPCC NYC/Westchester	0.00028912	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
NPCC Upstate NY	0.00013432	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
RFC East	0.00034572	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
RFC Michigan	0.00058017	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
RFC West	0.00056783	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SERC Midwest	0.00073583	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)

SERC Mississippi Valley	0.00038210	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SERC South	0.00049694	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SERC Tennessee Valley	0.00054108	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SERC Virginia/Carolina	0.00036755	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SPP North	0.00064535	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
SPP South	0.00056940	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
WECC California	0.00024040	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
WECC Northwest	0.00029732	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
WECC Rockies	0.00062473	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
WECC Southwest	0.00047597	metric tonnes CO2e per KWH	The US Environmental Protection Agency: - eGRID2016 (Year 2016 Data)
Electricity, Albania	0.0000134	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Algeria	0.000578	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Angola	0.00024	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Argentina	0.000358	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Armenia	0.00011	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Australia	0.000855	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Austria	0.000165	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Azerbaijan	0.000446	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Bahrain	0.000667	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Bangladesh	0.000587	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Belarus	0.000305	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Belgium	0.00022	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Benin	0.000727	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Bolivia	0.000396	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Bosnia and Herzegovina	0.000778	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Botswana	0.00207	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Brazil	0.0000663	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Brunei Darussalam	0.000757	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Bulgaria	0.000466	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Cambodia	0.00115	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Cameroon	0.000245	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Canada	0.000169	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Chile	0.000375	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, China	0.000745	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Taiwan, China	0.000637	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Colombia	0.000177	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Congo	0.000209	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Costa Rica	0.000042	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Côte d'Ivoire	0.000429	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Croatia	0.000286	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Cuba	0.000754	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Cyprus	0.000746	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Czech Republic	0.000516	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Dem. People's Republic of Korea	0.000501	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Democratic Republic of Congo	0.00000515	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Denmark	0.000305	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Dominican Republic	0.000593	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Ecuador	0.000292	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Egypt	0.000468	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, El Salvador	0.000321	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Eritrea	0.000674	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Estonia	0.000706	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Ethiopia	0.000121	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Finland	0.000208	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, France	0.0000921	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, FYR of Macedonia	0.000712	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Gabon	0.000324	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Georgia	0.000131	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Germany	0.000433	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Ghana	0.000189	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Gibraltar	0.000742	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Greece	0.000725	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Guatemala	0.000351	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Haiti	0.000549	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Honduras	0.000347	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Hong Kong, China	0.000765	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Hungary	0.000304	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Iceland	0.00000264	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, India	0.000954	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Indonesia	0.000748	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Iraq	0.000686	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Ireland	0.000467	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Islamic Republic of Iran	0.000632	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Israel	0.000697	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Italy	0.000389	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Jamaica	0.000547	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Japan	0.000417	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Jordan	0.000583	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Kazakhstan	0.000482	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Kenya	0.000397	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Korea	0.0005	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Kuwait	0.000872	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Kyrgyzstan	0.0000832	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Latvia	0.000155	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Lebanon	0.000719	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Libyan Arab Jamahiriya	0.000874	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Lithuania	0.000113	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Luxembourg	0.000386	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Malaysia	0.000651	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Malta	0.000853	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Mexico	0.000457	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Middle East	0.000692	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Mongolia	0.000538	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Morocco	0.000641	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Mozambique	0.00000271	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Myanmar	0.000198	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Namibia	0.000239	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Nepal	0.00000655	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Netherlands	0.000377	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Netherlands Antilles	0.000709	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, New Zealand	0.000169	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Nicaragua	0.000508	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Nigeria	0.000418	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Norway	0.0000195	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Oman	0.000845	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Other Africa	0.000497	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Other Asia	0.00027	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Other Latin America	0.000251	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Pakistan	0.00046	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Panama	0.000304	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Paraguay	0.00000221	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, China (mainland)	0.000745	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Peru	0.000239	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Philippines	0.00048	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Poland	0.000642	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Portugal	0.00037	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Qatar	0.000496	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Republic of Moldova	0.000402	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Romania	0.000417	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Russian Federation	0.00032	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Saudi Arabia	0.000759	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Senegal	0.000617	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Serbia	0.000683	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Singapore	0.00042661	metric tonnes CO2e per KWH	2017 Singapore Energy Statistics, Energy Market Authority (EMA), (Table 7.1, page 108)
Electricity, Slovak Republic	0.000224	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Slovenia	0.000318	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, South Africa	0.000928	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Spain	0.000301	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Sri Lanka	0.000462	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Sudan	0.000358	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Sweden	0.0000453	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Switzerland	0.0000421	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Syrian Arab Republic	0.000643	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Tajikistan	0.0000314	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Thailand	0.000516	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Togo	0.000204	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Trinidad and Tobago	0.000721	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Tunisia	0.00054	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Turkey	0.000482	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Turkmenistan	0.000792	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Ukraine	0.000376	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, United Arab Emirates	0.000633	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, United Kingdom	0.000452	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, United Republic of Tanzania	0.000283	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, United States	0.00051	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011

			edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Uruguay	0.000255	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Uzbekistan	0.000464	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Venezuela	0.000201	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Vietnam	0.000386	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Yemen	0.000633	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Zambia	0.00000546	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Zimbabwe	0.000621	metric tonnes CO2e per KWH	International Energy Agency, 'CO2 Emissions from Fuel Combustion', 2011 edition. Table 9. International Fuel-based Electricity Emission Factors for CO2
Electricity, Canada, Alberta	862.14	g CO2e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, British Columbia	23.4535	g CO2e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.

Electricity, Canada, Manitoba	2.5693	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, New Brunswick	502.518	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Newfoundland and Labrador	17.8381	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Northwest Territories & Nunavut	377.922	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Nova Scotia	759.658	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Ontario	133.075	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Prince Edward Island	3.39	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Quebec	2.5177	g CO ₂ e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.

Electricity, Canada, Saskatchewan	800.42	g CO2e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.
Electricity, Canada, Yukon	46.706	g CO2e per kWh	Greenhouse Gas Division, Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada (2013) Annex 13: Emission Factors, Table A13-2 - A13-13.