



COUNTRY SPECIFIC ELECTRICITY FACTORS

Last Updated August 2018

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The following grid electricity emissions factors are used in our online calculators. Countries and territories are ordered alphabetically and grouped by geographic area.

Grouping	Country	Factor (kgCO ₂ e per kWh)	Source	Year	Comments
Africa	South Africa	1.0090	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
Asia	China (PR)	0.6800	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Hong Kong (China)	0.7900	Hong Kong Legislative Council	2017	Generation factor
	India	0.8130	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Indonesia	0.7360	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Japan	0.5560	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Korea (Republic)	0.5170	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
Australasia	Australia	0.9000	Australian Government	2017	Combined generation and distribution factor
	New Zealand	0.7756	Ministry for the Environment	2016	Combined generation and distribution factor
Middle East	Saudi Arabia	0.7110	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Turkey	0.4970	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	United Arab Emirates	0.4382	Dubai Electricity & Water Authority	2016	Generation factor only
North & Central America	Canada	0.1500	UN Framework Convention on Climate Change	2017	Combined generation and distribution factor
	Mexico	0.4570	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	United States	0.4759	US Env Protection Agency (EPA) eGrid	2016	Combined generation and distribution factor
South America	Argentina	0.3940	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector
	Brazil	0.1600	Climate Transparency (2017 Report)	2016	Emissions intensity of the power sector

Grouping	Country	Factor (kgCO ₂ e per kWh)	Source	Year	Comments
Europe	Austria	0.1480	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Belgium	0.1390	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Bulgaria	0.5140	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Croatia	0.3030	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Cyprus	0.6370	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Czech Republic	0.5900	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Denmark	0.1910	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Estonia	0.8720	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Finland	0.1850	Association of Issuing Bodies (AIB)	2017	Production mix factor
	France	0.0530	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Germany	0.4880	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Greece	0.6200	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Hungary	0.3040	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Iceland	0.0001	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Ireland	0.4420	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Italy	0.3520	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Latvia	0.2440	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Lithuania	0.5340	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Luxembourg	0.2000	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Malta	0.7610	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Netherlands	0.4590	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Norway	0.0110	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Poland	0.8360	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Portugal	0.3830	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Romania	0.4250	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Slovakia	0.1610	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Slovenia	0.3480	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Spain	0.3090	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Sweden	0.0120	Association of Issuing Bodies (AIB)	2017	Production mix factor
	Switzerland	0.0160	Association of Issuing Bodies (AIB)	2017	Production mix factor
United Kingdom	0.3072	UK Govt – Defra/BEIS	2018	Combined generation and T&D factor	

UNITED STATES REGIONAL FACTORS (BY STATE)

Regional factors are sourced directly from the United States Environmental Protection Agency's (EPA) eGrid database. All factors used are combined generation and transmission & distribution emissions factors.

State	Grid	Factor (kgCO ₂ e per kWh)	Year
Alaska (AK)	ASCC & ASCC Misc. - Alaska Grid	0.3777	2016
Alabama (AL)	SERC - South	0.5190	2016
Arkansas (AR)	SERC - South	0.5190	2016
Arizona (AZ)	WECC - Southwest	0.6509	2016
California (CA)	WECC- California	0.2505	2016
Colorado (CO)	WECC - Rockies	0.6509	2016
Connecticut (CT)	NPCC - New England	0.2672	2016
Washington DC (DC)	RFC - East	0.3612	2016
Delaware (DE)	RFC - East	0.3612	2016
Florida (FL)	FRCC - All	0.4817	2016
Georgia (GA)	SERC - South	0.5190	2016
Hawaii (HI)	HICC - Misc. & Oahu	0.6771	2016
Iowa (IA)	MRO - East	0.7959	2016
Idaho (ID)	WECC - Rockies	0.6509	2016
Illinois (IL)	MRO - East	0.7959	2016
Indiana (IN)	RFC - West	0.5931	2016
Kansas (KS)	SPP - North	0.6740	2016
Kentucky (KY)	SERC - Tennessee Valley	0.5652	2016
Louisiana (LA)	SERC - South	0.5190	2016
Massachusetts (MA)	NPCC - New England	0.2672	2016
Maryland (MD)	RFC - East	0.3612	2016
Maine (ME)	NPCC - New England	0.2672	2016
Michigan (MI)	RFC - Michigan	0.6061	2016
Minnesota (MN)	MRO - East	0.7959	2016
Missouri (MO)	SERC - South	0.5190	2016
Mississippi (MS)	SERC - South	0.5190	2016
Montana (MT)	WECC - Rockies	0.6509	2016



State	Grid	Factor (kgCO ₂ e per kWh)	Year
North Carolina (NC)	SERC - Virginia/Carolinas	0.3840	2016
North Dakota (ND)	MRO-West	0.5912	2016
Nebraska (NE)	MRO-West	0.5912	2016
New Hampshire (NH)	NPCC - New England	0.2672	2016
New Jersey (NJ)	RFC - East	0.3612	2016
New Mexico (NM)	WECC - Southwest	0.4960	2016
Nevada (NV)	WECC - Rockies	0.6509	2016
New York (NY)	NPCC - LI, NYC, & Upstate NY	0.3348	2016
Ohio (OH)	RFC - West	0.5931	2016
Oklahoma (OK)	SPP- South	0.5947	2016
Oregon (OR)	WECC - Northwest	0.3099	2016
Pennsylvania (PA)	RFC - West	0.5931	2016
Rhode Island (RI)	NPCC - New England	0.2672	2016
South Carolina (SC)	SERC - Virginia/Carolinas	0.3840	2016
South Dakota (SD)	MRO-West	0.5912	2016
Tennessee (TN)	SERC - Tennessee Valley	0.5652	2016
Texas (TX)	ERCOT - All	0.4825	2016
Utah (UT)	WECC - Rockies	0.6509	2016
Virginia (VA)	SERC - Virginia/Carolinas	0.3840	2016
Vermont (VT)	NPCC - New England	0.2672	2016
Washington (WA)	WECC - Northwest	0.3099	2016
Wisconsin (WI)	MRO - East	0.7959	2016
West Virginia (WV)	SERC - Virginia/Carolinas	0.3840	2016
Wyoming (WY)	WECC - Rockies	0.6509	2016

CANADA REGIONAL FACTORS (BY PROVINCE)

Province factors sourced from Canada's latest submission to the UN Framework Convention on Climate Change (April 2017). The factors listed below are combined generation and transmission & distribution emissions factors.

State	Factor (kgCO ₂ e per kWh)	Year
Alberta (AB)	0.9	2017
British Columbia (BC)	0.0117	2017
Manitoba (MT)	0.0022	2017
New Brunswick (NB)	0.35	2017
Newfoundland and Labrador (NL)	0.04	2017
Nova Scotia (NS)	0.69	2017
Northwest Territories (NT)	0.22	2017
Nunavut (NU)	0.76	2017
Ontario (ON)	0.04	2017
Prince Edward Island (PE)	0.025	2017
Quebec (QC)	0.0017	2017
Saskatchewan (SK)	0.73	2017
Yukon Territory (YT)	0.5	2017

AUSTRALIA REGIONAL FACTORS (BY STATE)

State specific factors are sourced from publicly available emissions factors published by the Australian Government to support annual GHG measurements. Each factor listed below is a combined generation and transmission & distribution emissions factor.

State	Factor (kgCO ₂ e per kWh)	Year
Australian Capital Territory	0.92	2017
New South Wales	0.92	2017
Northern Territory	0.72	2017
Queensland	0.92	2017
South Australia	0.61	2017
Tasmania	0.22	2017
Victoria	1.16	2017
Western Australia	0.75	2017

Sources of Emissions Factors:

- **Defra/BEIS 2018 Emissions Factors** - <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>
- **United States EPA eGrid Database (2016)** - <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>
- **Australian Government Dept of Environment & Energy Emissions Factors (2018)** - <http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/national-greenhouse-accounts-factors-july-2018>
- **New Zealand Government Ministry for the Environment (2017)** - https://www.mfe.govt.nz/sites/default/files/media/2016-voluntary-ghg-reporting-summary-tables-emissions_0.pdf
- **Dubai Electricity & Water Authority (DEWA) (2017)** - <https://www.dewa.gov.ae/en/customer/sustainability/conserve-now/sustainability-reports>
- **Hong Kong Legislative Council (2017)** – <http://www.legco.gov.hk/general/english/visiting/ghg-accounting-report-2016-2017-e.pdf>
- **United Nations Framework Convention on Climate Change (2018)** - <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018>
- **Climate Transparency (2017)** – Country profiles from 'G20 Brown to Green Report 2017' - <https://www.climate-transparency.org/g20-climate-performance/g20report2017/country-profiles>