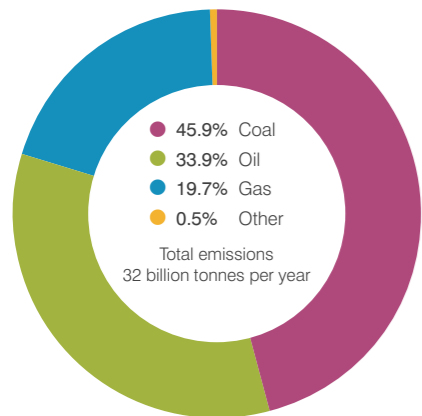
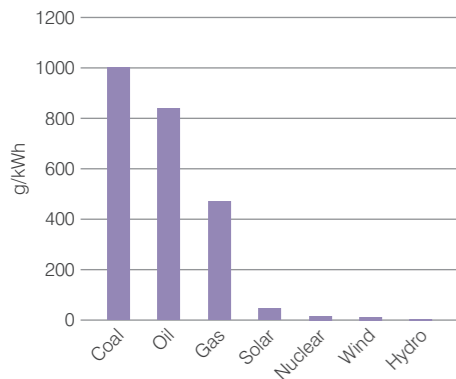


Global CO₂ emissions, (2014)



Source: IEA - Key World Energy Statistics

Carbon emissions by energy source



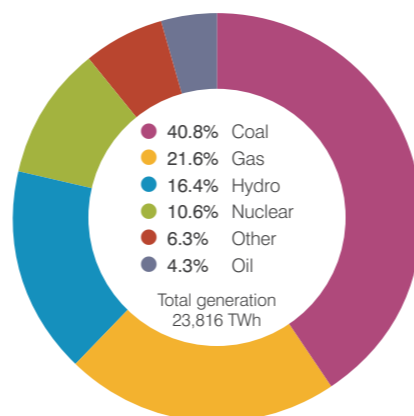
Source: IPCC

Countries with nuclear electricity

Location	Nuclear capacity MWe	% share of electricity, 2016
USA	99,678	20
France	63,130	72
Japan	39,952	2
China	32,637	4
Russia	26,865	17
South Korea	23,081	30
Canada	13,553	16
Ukraine	13,107	52
Germany	10,728	13
UK	8883	20
Sweden	8849	40
Spain	7121	21
India	6219	3
Belgium	5943	52
Czech Republic	3904	29
Switzerland	3333	34
Finland	2764	34
Bulgaria	1926	35
Brazil	1896	3
Hungary	1889	51
South Africa	1830	7
Slovakia	1816	54
Argentina	1627	6
Mexico	1600	6
Romania	1310	17
Pakistan	1040	4
Iran	915	2
Slovenia	696	35
Netherlands	485	3
Armenia	376	31
Total*	392,080	11.5

* Includes six reactors on Taiwan with total of 4927 MWe.
Sources: World Nuclear Association, IAEA
as of 02.05.17

Electricity generation by fuel (2014)



Source: IEA - Key World Energy Statistics

Nuclear and climate change

Electricity from nuclear power plants generates significantly lower emissions of carbon dioxide (CO₂), which is a greenhouse gas, compared with fossil fuel plants.

A study by the International Atomic Energy Agency puts greenhouse gas emissions from nuclear generation at between 9 and 21 tonnes CO₂-equivalent per GWh of electricity produced. This compares with between 385 and 1343 tonnes for fossil fuel and between 9 and 279 tonnes for renewable energy sources.

Nuclear power accounted for about 11.5% of global electricity production in 2016. The current use of nuclear energy avoids the emission of about 2.1 billion tonnes of CO₂-equivalent every year.

According to the International Energy Agency (IEA), nuclear energy has avoided the emission of some 56

gigatonnes of CO₂, the equivalent of two years' global emissions at today's rate. It is estimated that, at current nuclear usage levels, almost four years' worth of CO₂ emissions will be avoided by 2040.

The IEA predicts that global electricity demand will increase by between 80% and 130% by 2050.

Studies show that significant reductions in carbon emissions, while also meeting this growing demand, cannot happen without nuclear as a major provider of low carbon energy.

At least 80% of the world's electricity must be low-carbon by 2050 if the world is to keep global warming within 2°C, according to the Intergovernmental Panel on Climate Change.

Harmony

The global nuclear industry envisages a diverse mix of low carbon generating technologies in order for the 2°C target to be met. The Harmony goal is for nuclear energy to provide 25% of electricity in 2050, requiring some 1000 GWe of new nuclear capacity to be constructed. The build rate required to meet this goal is: 10 GWe per year between 2016 and 2020; 25 GWe per year between 2021 and 2025; and 33 GWe per year between 2026 and 2050.

Under the Harmony goal, the global nuclear industry should seek to realise a level playing field for all low carbon technologies; harmonised regulatory processes; and an effective safety paradigm.

Achieving 1000 GWe of new nuclear build by 2050 will require a cooperative effort by the whole nuclear community - from industry to research, governments, and regulators - to focus on demolishing the real barriers to growth. Harmony provides the framework for the nuclear industry to deliver its potential.



Nuclear Power, Energy and the Environment

Energy and emissions, selected countries (2014)

Location	Population (million)	GDP (billion US\$)	CO ₂ emissions (million tonnes)	Energy use per capita (toe*)
Australia	24	1,439	374	5.3
Austria	9	407	61	3.8
Bangladesh	159	147	62	0.2
Belgium	11	499	87	4.7
Brazil	206	2,412	476	1.5
Bulgaria	7	52	42	2.5
Canada	36	1,774	555	7.9
China	1,364	8,230	9,087	2.2
Colombia	48	349	73	0.7
Congo (DR)	75	28	5	0.4
Croatia	4	57	15	1.9
Czech Republic	11	212	97	3.9
Denmark	6	327	35	2.9
Egypt	90	238	173	0.8
Ethiopia	97	44	9	0.5
Finland	5	247	45	6.2
France	66	2,729	286	3.7
Germany	81	3,624	723	3.8
Hungary	10	137	40	2.3
Iceland	0	14	2	17.9
India	1,295	2,196	2,020	0.6
Indonesia	254	943	437	0.9
Iran	78	464	556	3.0
Ireland	5	241	34	2.8
Italy	61	2,034	320	2.4
Japan	127	5,643	1,189	3.5
Lithuania	3	44	10	2.4

Location	Population (million)	GDP (billion US\$)	CO ₂ emissions (million tonnes)	Energy use per capita (toe*)
Mexico	120	1,177	431	1.6
Myanmar	53	66	20	0.4
Netherlands	17	846	148	4.3
New Zealand	4	162	31	4.6
Nigeria	177	452	60	0.8
North Korea	25	38	38	0.5
Norway	5	459	35	5.6
Pakistan	185	206	137	0.5
Philippines	99	251	96	0.5
Romania	20	182	68	1.6
Russia	144	1,677	1,468	4.9
Saudi Arabia	31	650	507	6.9
Slovakia	5	97	29	2.9
Slovenia	2	48	13	3.2
South Africa	54	411	437	2.7
South Korea	50	1,234	568	5.3
Spain	46	1,376	232	2.5
Sweden	10	518	37	5.0
Switzerland	8	620	38	3.1
Thailand	68	383	244	2.0
Turkey	77	871	307	1.6
UAE	9	351	175	7.8
UK	65	2,606	408	2.8
Ukraine	45	134	237	2.3
USA	319	16,157	5,176	6.9
Vietnam	91	145	143	0.7
World	7,249	72,908	32,381	1.9

*Tonnes of oil equivalent

Source: IEA

CO₂ emissions per capita (2014)

Location	tonnes /capita	Location	tonnes /capita	Location	tonnes /capita
Saudi Arabia	16.4	Norway	6.9	Croatia	3.6
USA	16.2	China	6.7	Lithuania	3.5
Australia	15.8	UK	6.3	Romania	3.4
Canada	15.6	Iceland	6.3	Brazil	2.3
South Korea	11.3	Slovenia	6.2	Egypt	1.9
Taiwan	10.7	Denmark	6.1	Indonesia	1.7
Russia	10.2	Bulgaria	5.8	Vietnam	1.6
Japan	9.4	Slovakia	5.4	India	1.6
Czech Republic	9.2	Italy	5.3	Colombia	1.5
Germany	8.9	Ukraine	5.2	North Korea	1.5
Netherlands	8.8	Spain	5.0	Philippines	1.0
Finland	8.3	Switzerland	4.6	Pakistan	0.7
South Africa	8.1	France	4.3	Cote d'Ivoire	0.4
Belgium	7.8	Hungary	4.1	Bangladesh	0.4
Ireland	7.3	Turkey	4.0	Myanmar	0.4
Iran	7.1	Sweden	3.9	Nigeria	0.3
Austria	7.1	Mexico	3.6	Ethiopia	0.1
New Zealand	7.0	Thailand	3.6	Congo (DR)	0.1
World					4.5

Source: IEA

CO₂ emissions per GDP (2014)

Location	kg/ US\$	Location	kg/ US\$	Location	kg/ US\$
Switzerland	0.06	Germany	0.20	Bangladesh	0.42
Sweden	0.07	Colombia	0.21	Czech Republic	0.46
Norway	0.08	Ethiopia	0.21	Indonesia	0.46
France	0.10	Japan	0.21	South Korea	0.46
Denmark	0.11	Lithuania	0.24	Taiwan	0.52
Nigeria	0.13	Australia	0.26	Thailand	0.64
Iceland	0.14	Croatia	0.26	Pakistan	0.67
Ireland	0.14	Slovenia	0.27	Egypt	0.73
Austria	0.15	Hungary	0.29	Saudi Arabia	0.78
Italy	0.16	Cote d'Ivoire	0.30	Bulgaria	0.81
UK	0.16	Myanmar	0.30	Russia	0.88
Belgium	0.17	Slovakia	0.30	India	0.92
Congo (DR)	0.17	Canada	0.31	North Korea	0.99
Spain	0.17	USA	0.32	Vietnam	0.99
Finland	0.18	Turkey	0.35	South Africa	1.06
Netherlands	0.18	Mexico	0.37	China	1.10
New Zealand	0.19	Romania	0.37	Iran	1.20
Brazil	0.20	Philippines	0.38	Ukraine	1.76
World					0.44

Source: IEA

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