

California Greenhouse Gas Inventory (millions of metric tonnes of CO2 equivalent) — By IPCC Category

Last Updated: November 19, 2007

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<i>(CO2 equivalence based upon IPCC Fourth Assessment Report's Global Warming Potentials)</i>															
Categories Included in the Inventory.															
1 - Energy	387.00	372.63	374.15	369.89	380.76	367.84	364.91	381.33	395.93	401.55	400.11	416.28	407.81	405.34	421.38
1A - Fuel Combustion Activities	381.19	366.93	368.89	364.39	375.52	363.02	359.89	376.34	391.00	396.61	395.28	411.35	402.79	400.31	416.28
1A1 - Energy Industries	157.34	150.29	151.31	151.48	157.36	145.41	140.99	154.50	159.56	157.38	152.50	167.89	152.26	159.84	166.44
1A1a - Main Activity Electricity and Heat Production	115.844	108.838	110.639	112.936	120.612	106.525	99.200	108.157	115.070	116.793	111.602	124.900	111.234	115.680	123.201
1A1ai - Electricity Generation	90.499	83.080	82.392	84.048	91.231	77.385	68.649	77.445	83.177	84.459	79.120	95.666	78.490	86.011	93.109
1A1aii - Combined Heat and Power Generation (CHP)	25.346	25.758	28.247	28.888	29.380	29.140	30.551	30.712	31.893	32.333	32.482	29.235	32.745	29.669	30.092
1A1b - Petroleum Refining	27.635	28.216	27.326	27.711	27.038	26.483	28.620	28.137	28.694	26.827	28.027	28.105	28.840	29.850	29.112
1A1c - Manufacture of Solid Fuels and Other Energy Industries	13.858	13.239	13.345	10.835	9.712	12.399	13.170	18.207	15.798	13.761	12.872	14.887	12.186	14.310	14.122
1A1cii - Other Energy Industries	13.858	13.239	13.345	10.835	9.712	12.399	13.170	18.207	15.798	13.761	12.872	14.887	12.186	14.310	14.122
1A2 - Manufacturing Industries and Construction	24.24	22.14	20.29	19.74	20.94	20.76	20.04	20.41	21.60	22.32	23.56	23.95	20.68	18.66	19.46
1A2c - Chemicals	0.961	0.857	0.659	0.529	0.612	0.602	0.633	0.536	0.724	0.572	0.700	0.602	1.110	0.663	0.677
1A2d - Pulp, Paper and Print	1.915	1.652	1.158	1.282	1.681	1.723	1.993	1.627	1.628	1.506	1.385	1.685	1.129	1.045	1.115
1A2e - Food Processing, Beverages and Tobacco	3.072	3.266	3.230	3.282	3.255	3.157	3.126	3.146	3.530	3.637	3.599	3.305	3.457	3.172	3.397
1A2f - Non-Metallic Minerals	5.125	4.956	4.942	4.874	4.849	4.845	5.047	5.189	5.393	5.369	5.495	5.455	5.361	5.320	5.402
1A2g - Transport Equipment	0.534	0.531	0.528	0.513	0.514	0.474	0.434	0.446	0.487	0.511	0.500	0.457	0.419	0.293	0.259
1A2h - Machinery	1.334	1.243	1.168	1.172	1.143	1.160	1.199	1.233	1.316	1.294	1.246	1.146	1.185	1.029	1.086
1A2i - Mining (excluding fuels) and Quarrying	0.028	0.031	0.041	0.036	0.038	0.308	0.344	0.325	0.318	0.321	0.331	0.309	0.300	0.332	0.103
1A2j - Wood and Wood Products	0.236	0.219	0.232	0.255	0.261	0.397	0.351	0.306	0.312	0.303	0.302	0.336	0.163	0.138	0.109
1A2k - Construction	0.667	0.653	0.628	0.635	0.638	0.635	0.643	0.657	0.678	0.651	0.643	0.581	0.605	0.623	0.763
1A2l - Textile and Leather	0.378	0.349	0.354	0.391	0.427	0.432	0.451	0.478	0.516	0.560	0.571	0.480	0.576	0.565	0.564
1A2m - Non-specified Industry.	9.049	7.485	6.597	6.010	6.668	6.242	4.994	5.628	5.820	6.713	7.881	8.805	5.683	4.772	5.504
1A3 - Transport	149.95	145.92	152.13	147.98	150.34	153.94	155.50	157.78	160.99	165.40	169.24	173.19	179.33	175.21	181.87
1A3a - Civil Aviation	5.132	4.688	4.093	3.671	3.881	4.013	4.212	3.915	3.887	3.748	3.512	4.183	3.417	3.055	3.059
1A3aii - Domestic Aviation	5.113	4.669	4.079	3.658	3.868	4.003	4.202	3.906	3.877	3.736	3.500	4.173	3.374	3.011	3.016
1A3b - Road Transportation	137.917	134.409	141.661	139.340	140.366	143.469	144.969	148.280	151.223	155.785	159.245	162.188	168.905	165.395	171.427
1A3bi - Cars	63.712	62.318	65.606	63.542	62.530	62.917	62.865	63.200	63.239	63.845	65.412	65.220	66.979	62.011	63.051
1A3bii - Light-duty Trucks	44.714	44.512	47.640	48.122	48.854	50.669	51.960	53.884	56.218	58.924	60.513	63.600	67.931	67.968	72.080
1A3biii - Heavy-duty Trucks and Buses	29.027	27.120	27.993	27.283	28.610	29.515	29.762	30.882	31.459	32.701	32.998	32.984	33.549	34.816	35.646
1A3biv - Motorcycles	0.428	0.422	0.389	0.357	0.329	0.328	0.324	0.252	0.238	0.237	0.244	0.319	0.361	0.526	0.585
1A3c - Railways	2.331	2.463	2.236	1.970	2.131	2.428	2.593	2.567	2.699	2.798	3.067	2.900	3.041	2.785	3.189
1A3d - Water-borne Navigation	2.208	2.258	2.300	2.345	2.427	2.489	2.562	2.653	2.743	2.837	2.937	3.038	3.146	3.255	3.367
1A3di - International Water-borne Navigation (International Bunkers)	0.548	0.579	0.611	0.644	0.683	0.724	0.766	0.809	0.854	0.901	0.950	1.001	1.055	1.110	1.169
1A3dii - Domestic Water-borne Navigation	1.660	1.679	1.690	1.701	1.744	1.766	1.797	1.844	1.888	1.935	1.986	2.036	2.091	2.145	2.199
1A4 - Other Sectors	48.28	47.80	44.46	44.46	46.06	42.21	42.69	43.04	48.50	50.68	49.02	45.50	44.92	44.01	46.36
1A4a - Commercial/Institutional	14.036	13.612	11.479	11.118	11.719	11.202	11.178	11.303	12.297	12.964	12.802	11.515	11.432	11.916	12.340
1A4b - Residential	29.740	30.322	28.651	29.146	29.867	27.274	27.380	26.777	31.471	32.263	30.660	28.640	28.575	27.971	29.153
1A4c - Agriculture/Forestry/Fishing/Fish Farms	4.507	3.862	4.332	4.198	4.478	3.733	4.133	4.961	4.733	5.448	5.555	5.348	4.913	4.125	4.862
1A5 - Non-Specified	1.38	0.78	0.69	0.73	0.82	0.70	0.68	0.60	0.35	0.84	0.95	0.82	5.61	2.60	2.16
1B - Fugitive Emissions from Fuels	5.81	5.70	5.26	5.49	5.24	4.82	5.02	4.99	4.93	4.95	4.83	4.92	5.02	5.03	5.10
1B2 - Oil and Natural Gas	3.50	3.36	2.94	3.14	3.08	3.01	3.07	2.98	2.89	2.88	2.88	3.00	2.95	2.98	3.03
1B2a - Oil	0.166	0.093	0.086	0.079	0.080	0.085	0.065	0.052	0.053	0.069	0.064	0.030	0.035	0.035	0.035
1B2aiii - All Other	0.166	0.093	0.086	0.079	0.080	0.085	0.065	0.052	0.053	0.069	0.064	0.030	0.035	0.035	0.035
1B2b - Natural Gas	1.792	1.763	1.731	1.712	1.691	1.662	1.612	1.570	1.529	1.494	1.504	1.533	1.552	1.584	1.612
1B3 - Other Emissions from Energy Production	2.31	2.34	2.33	2.35	2.15	1.80	1.95	2.01	2.03	2.06	1.95	1.93	2.07	2.05	2.07

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	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
2 - Industrial Processes and Product Use	18.32	17.36	16.98	18.09	18.95	20.87	22.63	24.76	26.42	27.33	28.93	28.94	30.31	31.52	32.80
2A - Mineral Industry	4.85	4.85	4.85	4.82	4.85	4.89	5.01	5.15	5.28	5.42	5.57	5.65	5.73	5.82	5.90
2A1 - Cement Production	4.62	4.64	4.66	4.68	4.70	4.72	4.86	5.00	5.15	5.29	5.43	5.52	5.60	5.68	5.77
2A2 - Lime Production	0.23	0.21	0.19	0.14	0.15	0.17	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13
2B - Chemical Industry	2.32	1.91	1.79	1.51	1.66	1.61	1.26	1.21	1.40	1.21	1.37	1.18	1.23	1.25	1.31
2B2 - Nitric Acid Production	0.51	0.52	0.53	0.37	0.42	0.47	0.28	0.28	0.27	0.26	0.26	0.21	0.23	0.22	0.22
2D - Non-Energy Products from Fuels and Solvent Use	2.29	1.92	2.03	2.04	1.90	1.78	1.58	1.63	1.92	2.18	1.85	1.64	1.78	1.56	1.37
2D1 - Lubricant Use	1.13	1.01	1.03	1.05	1.10	1.08	1.05	1.11	1.16	1.17	1.15	1.06	1.04	0.96	0.98
2D2 - Paraffin Wax Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2D4 - Other (please specify)	1.16	0.91	1.00	0.99	0.80	0.70	0.53	0.52	0.76	1.01	0.70	0.58	0.74	0.59	0.39
2E - Electronics Industry	0.71	0.71	0.71	0.88	0.98	1.23	1.35	1.54	1.72	1.71	1.47	1.03	0.99	0.97	1.06
2F - Product Uses as Substitutes for Ozone Depleting Substances	0.04	0.08	0.41	1.03	2.05	4.32	6.04	7.77	8.90	10.00	11.02	12.13	13.32	14.59	15.87
2G - Other Product Manufacture and Use	3.07	2.78	2.55	2.93	2.71	2.30	2.44	2.20	1.90	1.87	1.68	1.62	1.60	1.52	1.55
2G1 - Electrical Equipment	2.46	2.21	2.00	2.37	2.12	1.64	1.78	1.58	1.27	1.20	1.09	1.09	1.00	0.98	0.97
2G1b - Use of Electrical Equipment	2.458	2.207	1.996	2.370	2.120	1.645	1.778	1.580	1.272	1.204	1.088	1.092	1.000	0.984	0.971
2G4 - Other (Please specify)	0.61	0.58	0.56	0.56	0.59	0.65	0.66	0.62	0.62	0.66	0.60	0.53	0.60	0.54	0.58
2H - Other	5.05	5.12	4.65	4.88	4.80	4.76	4.95	5.25	5.31	4.93	5.96	5.69	5.65	5.81	5.74
2H3 - Other (please specify)	5.05	5.12	4.65	4.88	4.80	4.76	4.95	5.25	5.31	4.93	5.96	5.69	5.65	5.81	5.74
3 - Agriculture, Forestry and Other Land Use	21.06	20.26	20.62	20.36	20.99	22.10	21.04	21.12	20.94	22.09	23.02	23.08	25.44	25.72	25.61
3A - Livestock	13.76	13.64	13.87	13.22	13.92	14.32	13.40	14.02	13.89	14.82	15.09	15.67	16.19	16.58	16.42
3A1 - Enteric Fermentation	7.94	7.71	7.82	7.41	7.72	7.84	7.32	7.50	7.49	7.86	7.95	8.09	8.32	8.42	8.35
3A1a - Cattle	7.441	7.203	7.318	6.927	7.204	7.330	6.829	7.018	7.021	7.384	7.478	7.622	7.853	7.966	7.901
3A1ai - Dairy Cows	4.324	4.424	4.551	4.221	4.538	4.609	4.231	4.469	4.499	4.821	5.005	5.195	5.436	5.550	5.578
3A1aii - Other Cattle	3.117	2.779	2.767	2.706	2.666	2.721	2.598	2.548	2.523	2.563	2.473	2.427	2.417	2.416	2.323
3A1c - Sheep	0.200	0.203	0.199	0.179	0.216	0.204	0.184	0.176	0.160	0.166	0.162	0.161	0.151	0.146	0.136
3A1d - Goats	0.004	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.008	0.009	0.010	0.012	0.013	0.013	0.013
3A1f - Horses	0.286	0.287	0.288	0.289	0.288	0.289	0.290	0.290	0.291	0.295	0.295	0.295	0.295	0.295	0.295
3A1h - Swine	0.007	0.008	0.010	0.010	0.010	0.009	0.008	0.008	0.008	0.007	0.006	0.004	0.006	0.005	0.005
3A2 - Manure Management	5.82	5.93	6.05	5.81	6.20	6.48	6.08	6.52	6.41	6.96	7.14	7.57	7.87	8.15	8.07
3A2a - Cattle	5.454	5.562	5.666	5.450	5.836	6.134	5.752	6.188	6.107	6.655	6.869	7.314	7.604	7.897	7.830
3A2ai - Dairy Cows	5.116	5.264	5.392	5.155	5.573	5.854	5.509	5.931	5.843	6.383	6.590	7.018	7.299	7.586	7.524
3A2aii - Other Cattle	0.338	0.298	0.274	0.295	0.263	0.280	0.243	0.257	0.264	0.272	0.279	0.297	0.305	0.311	0.306
3A2c - Sheep	0.022	0.022	0.021	0.019	0.023	0.022	0.020	0.019	0.017	0.018	0.017	0.017	0.016	0.016	0.015
3A2d - Goats	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001
3A2f - Horses	0.042	0.042	0.042	0.042	0.042	0.032	0.032	0.032	0.033	0.032	0.026	0.026	0.026	0.026	0.026
3A2h - Swine	0.080	0.090	0.113	0.109	0.108	0.107	0.093	0.094	0.084	0.079	0.062	0.048	0.065	0.061	0.062
3A2i - Poultry	0.223	0.217	0.205	0.188	0.189	0.187	0.185	0.189	0.164	0.170	0.167	0.166	0.160	0.150	0.135
3B - Land	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
3B1 - Forest Land	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
3C - Aggregate Sources and Non-CO2 Emissions Sources on Land	7.08	6.39	6.53	6.92	6.85	7.56	7.42	6.87	6.83	7.05	7.70	7.19	9.03	8.93	8.97
3C1 - Emissions from Biomass Burning	0.13	0.12	0.11	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.10	0.08	0.08	0.08	0.09
3C1b - Biomass Burning in Croplands	0.127	0.115	0.109	0.116	0.113	0.108	0.103	0.090	0.092	0.091	0.096	0.081	0.082	0.085	0.086
3C2 - Liming	0.07	0.10	0.11	0.07	0.16	0.27	0.27	0.35	0.25	0.30	0.27	0.16	0.23	0.24	0.24
3C4 - Direct N2O Emissions from Managed Soils	5.00	4.51	4.55	4.79	4.66	5.08	4.95	4.47	4.55	4.65	5.07	4.84	6.13	6.05	5.99
3C5 - Indirect N2O Emissions from Managed Soils	1.39	1.24	1.28	1.39	1.32	1.53	1.48	1.33	1.37	1.39	1.59	1.52	1.93	1.93	1.92

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3C7 - Rice Cultivations	0.49	0.43	0.49	0.54	0.60	0.57	0.62	0.64	0.57	0.62	0.68	0.58	0.65	0.63	0.73
4 - Waste	11.03	10.77	11.08	11.21	11.31	10.80	10.73	10.72	10.98	11.03	10.85	10.99	10.92	11.03	11.00
4A - Solid Waste Disposal	7.45	7.13	7.39	7.47	7.49	6.99	6.87	6.81	7.03	6.98	6.72	6.79	6.69	6.76	6.69
4A1 - Managed Waste Disposal Sites	7.45	7.13	7.39	7.47	7.49	6.99	6.87	6.81	7.03	6.98	6.72	6.79	6.69	6.76	6.69
4D - Wastewater Treatment and Discharge	3.58	3.64	3.69	3.74	3.81	3.81	3.86	3.91	3.94	4.06	4.13	4.20	4.23	4.27	4.31
4D1 - Domestic Wastewater Treatment and Discharge	3.18	3.26	3.32	3.36	3.40	3.41	3.44	3.50	3.55	3.63	3.68	3.77	3.73	3.81	3.84
4D2 - Industrial Wastewater Treatment and Discharge	0.40	0.38	0.36	0.38	0.41	0.39	0.41	0.41	0.39	0.43	0.46	0.43	0.49	0.46	0.47

Summary of Categories Included in the Inventory.*(using IPCC Fourth Assessment Report's GWPs)*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross California Emissions	437.41	421.01	422.83	419.55	432.01	421.61	419.32	437.93	454.27	462.01	462.90	479.28	474.48	473.61	490.79
Sinks from Forests and Rangelands	-6.69	-6.54	-6.33	-6.03	-5.79	-5.56	-5.42	-5.37	-5.19	-5.18	-5.02	-4.83	-4.69	-4.67	-4.66
Net California Emissions	430.72	414.48	416.50	413.52	426.22	416.04	413.90	432.56	449.07	456.83	457.88	474.45	469.78	468.95	486.12

Categories Excluded from the Inventory.*(CO2 equivalence based upon IPCC Fourth Assessment Report's Global Warming Potentials)*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1 - Energy	59.01	52.99	45.38	46.21	52.90	55.12	56.50	48.60	48.36	50.46	55.51	51.07	53.05	40.79	44.15
1A - Fuel Combustion Activities	59.01	52.99	45.38	46.21	52.90	55.12	56.50	48.60	48.36	50.46	55.51	51.07	53.05	40.79	44.15
1A3 - Transport	59.01	52.99	45.38	46.21	52.90	55.12	56.50	48.60	48.36	50.46	55.51	51.07	53.05	40.79	44.15
1A3a - Civil Aviation	33.945	32.411	31.589	32.939	36.559	34.984	38.200	38.265	39.110	36.616	38.572	35.527	38.418	30.835	32.907
1A3ai - International Aviation (International Bunkers)	14.593	13.849	13.320	13.703	15.152	14.607	15.901	15.805	16.148	15.120	15.783	14.896	15.676	12.677	13.479
1A3aii - Domestic Aviation	19.351	18.562	18.269	19.236	21.407	20.377	22.299	22.460	22.962	21.497	22.789	20.630	22.742	18.158	19.428
1A3d - Water-borne Navigation	25.062	20.579	13.787	13.269	16.341	20.133	18.304	10.332	9.246	13.848	16.940	15.543	14.633	9.953	11.242
1A3di - International Water-borne Navigation (International Bunkers)	25.062	20.579	13.787	13.269	16.341	20.133	18.304	10.332	9.246	13.848	16.940	15.543	14.633	9.953	11.242

Summary of Categories Excluded from the Inventory.*(using IPCC Fourth Assessment Report's GWPs)*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross California Emissions	59.01	52.99	45.38	46.21	52.90	55.12	56.50	48.60	48.36	50.46	55.51	51.07	53.05	40.79	44.15
Gross California Emissions	27.58	26.49	27.64	24.71	24.90	23.39	22.81	21.09	19.98	21.22	22.36	22.15	22.26	22.56	22.37
Net California Emissions	86.59	79.48	73.02	70.92	77.80	78.50	79.31	69.69	68.33	71.69	77.88	73.22	75.32	63.35	66.52