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

Last Updated: Monday, November 19, 2007

Categories Included in the Inventory.

(CO2 equivalence based upon IPCC Second Assessement Report's Global Warming Potentials)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1 - Energy	**386.41**	**372.06**	**373.67**	**369.39**	**380.27**	**367.36**	**364.41**	**380.88**	**395.49**	**401.11**	**399.66**	**415.82**	**407.36**	**404.88**	**420.91**
1A - Fuel Combustion Activities	**381.16**	**366.90**	**368.88**	**364.40**	**375.53**	**363.02**	**359.88**	**376.36**	**391.03**	**396.63**	**395.29**	**411.37**	**402.81**	**400.32**	**416.29**
1A1 - Energy Industries	**157.33**	**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**	**166.43**
1A1a - Main Activity Electricity and Heat Production	115.843	108.838	110.636	112.935	120.610	106.526	99.200	108.158	115.071	116.793	111.599	124.898	111.233	115.679	123.201
1A1ai - Electricity Generation	90.502	83.083	82.393	84.050	91.233	77.389	68.652	77.449	83.181	84.462	79.121	95.667	78.491	86.013	93.111
1A1aii - Combined Heat and Power Generation (CHP)	25.341	25.755	28.243	28.885	29.377	29.137	30.549	30.709	31.890	32.331	32.478	29.231	32.742	29.666	30.090
1A1b - Petroleum Refining	27.633	28.214	27.325	27.710	27.037	26.481	28.619	28.136	28.692	26.825	28.025	28.103	28.838	29.848	29.111
1A1c - Manufacture of Solid Fuels and Other Energy Industries	13.858	13.239	13.344	10.834	9.712	12.398	13.170	18.206	15.798	13.760	12.872	14.886	12.186	14.310	14.121
1A1cii - Other Energy Industries	13.858	13.239	13.344	10.834	9.712	12.398	13.170	18.206	15.798	13.760	12.872	14.886	12.186	14.310	14.121
1A2 - Manufacturing Industries and Construction	**24.24**	**22.13**	**20.29**	**19.73**	**20.93**	**20.76**	**20.03**	**20.41**	**21.60**	**22.32**	**23.56**	**23.94**	**20.67**	**18.65**	**19.45**
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	3.265	3.230	3.281	3.255	3.157	3.126	3.146	3.530	3.637	3.599	3.304	3.457	3.172	3.397
1A2f - Non-Metallic Minerals	5.124	4.955	4.941	4.873	4.848	4.844	5.046	5.188	5.392	5.368	5.495	5.454	5.361	5.319	5.401
1A2g - Transport Equipment	0.533	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	0.563
1A2m - Non-specified Industry.	9.043	7.480	6.592	6.007	6.664	6.239	4.991	5.624	5.817	6.710	7.877	8.800	5.680	4.769	5.500
1A3 - Transport	**150.02**	**146.00**	**152.23**	**148.08**	**150.44**	**154.04**	**155.59**	**157.87**	**161.08**	**165.49**	**169.33**	**173.28**	**179.41**	**175.29**	**181.95**
1A3a - Civil Aviation	5.132	4.688	4.093	3.671	3.881	4.013	4.212	3.915	3.888	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	4.174	3.374	3.011	3.016
1A3b - Road Transportation	137.992	134.485	141.765	139.441	140.467	143.572	145.061	148.370	151.314	155.878	159.336	162.275	168.990	165.474	171.506
1A3bi - Cars	63.746	62.351	65.647	63.580	62.567	62.954	62.898	63.232	63.271	63.877	65.442	65.249	67.008	62.037	63.078
1A3bii - Light-duty Trucks	44.754	44.552	47.692	48.174	48.906	50.720	52.007	53.931	56.265	58.971	60.558	63.643	67.973	68.006	72.117
1A3biii - Heavy-duty Trucks and Buses	29.031	27.125	28.005	27.295	28.624	29.529	29.775	30.895	31.472	32.715	33.014	33.000	33.565	34.832	35.662
1A3biv - Motorcycles	0.426	0.420	0.388	0.356	0.328	0.327	0.323	0.251	0.238	0.236	0.243	0.318	0.361	0.525	0.584
1A3c - Railways	2.331	2.463	2.236	1.970	2.131	2.428	2.593	2.567	2.699	2.797	3.067	2.900	3.041	2.785	3.189
1A3d - Water-borne Navigation	2.210	2.259	2.302	2.346	2.429	2.490	2.564	2.655	2.744	2.838	2.938	3.039	3.147	3.257	3.369
1A3di - International Water-borne Navigation (International Bunkers)	0.548	0.579	0.611	0.644	0.683	0.724	0.766	0.809	0.855	0.902	0.951	1.002	1.055	1.111	1.169
1A3dii - Domestic Water-borne Navigation	1.662	1.681	1.691	1.703	1.746	1.767	1.798	1.845	1.889	1.936	1.988	2.038	2.092	2.146	2.200
1A4 - Other Sectors	**48.19**	**47.70**	**44.36**	**44.37**	**45.97**	**42.11**	**42.59**	**42.98**	**48.44**	**50.61**	**48.95**	**45.44**	**44.86**	**43.95**	**46.29**
1A4a - Commercial/Institutional	14.026	13.602	11.470	11.109	11.709	11.193	11.167	11.294	12.288	12.954	12.792	11.505	11.422	11.906	12.331
1A4b - Residential	29.657	30.234	28.560	29.067	29.789	27.189	27.296	26.725	31.421	32.210	30.605	28.593	28.524	27.920	29.102
1A4c - Agriculture/Forestry/Fishing/Fish Farms	4.505	3.860	4.330	4.196	4.476	3.731	4.131	4.959	4.731	5.445	5.553	5.346	4.911	4.124	4.860
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	**5.25**	**5.16**	**4.79**	**4.99**	**4.74**	**4.34**	**4.53**	**4.51**	**4.46**	**4.49**	**4.37**	**4.45**	**4.54**	**4.56**	**4.62**
1B2 - Oil and Natural Gas	**2.94**	**2.82**	**2.47**	**2.64**	**2.59**	**2.53**	**2.58**	**2.51**	**2.43**	**2.42**	**2.42**	**2.52**	**2.48**	**2.50**	**2.54**
1B2a - Oil	0.139	0.078	0.072	0.067	0.067	0.071	0.055	0.044	0.045	0.058	0.053	0.025	0.029	0.029	0.029
1B2aiii - All Other	0.139	0.078	0.072	0.067	0.067	0.071	0.055	0.044	0.045	0.058	0.053	0.025	0.029	0.029	0.029
1B2b - Natural Gas	1.505	1.481	1.454	1.438	1.420	1.396	1.354	1.319	1.284	1.255	1.263	1.288	1.304	1.330	1.354
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	**18.34**	**17.37**	**16.94**	**17.96**	**18.69**	**20.31**	**21.86**	**23.74**	**25.21**	**25.98**	**27.48**	**27.42**	**28.65**	**29.69**	**30.78**
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	**2.34**	**1.93**	**1.81**	**1.52**	**1.68**	**1.63**	**1.27**	**1.23**	**1.41**	**1.22**	**1.38**	**1.19**	**1.24**	**1.26**	**1.32**
2B2 - Nitric Acid Production	**0.53**	**0.54**	**0.55**	**0.38**	**0.44**	**0.49**	**0.30**	**0.30**	**0.28**	**0.27**	**0.27**	**0.22**	**0.23**	**0.23**	**0.23**
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	**0.59**	**0.59**	**0.59**	**0.74**	**0.82**	**1.02**	**1.12**	**1.29**	**1.43**	**1.43**	**1.23**	**0.86**	**0.83**	**0.81**	**0.88**
2F - Product Uses as Substitutes for Ozone Depleting Substances	**0.04**	**0.07**	**0.36**	**0.92**	**1.83**	**3.86**	**5.39**	**6.92**	**7.91**	**8.87**	**9.76**	**10.72**	**11.77**	**12.87**	**13.97**
2G - Other Product Manufacture and Use	**3.18**	**2.89**	**2.65**	**3.04**	**2.81**	**2.38**	**2.52**	**2.28**	**1.96**	**1.92**	**1.74**	**1.67**	**1.65**	**1.57**	**1.60**
2G1 - Electrical Equipment	**2.58**	**2.31**	**2.09**	**2.48**	**2.22**	**1.72**	**1.86**	**1.66**	**1.33**	**1.26**	**1.14**	**1.14**	**1.05**	**1.03**	**1.02**
2G1b - Use of Electrical Equipment	2.577	2.313	2.092	2.484	2.223	1.724	1.863	1.656	1.334	1.262	1.141	1.144	1.048	1.031	1.018
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	**19.11**	**18.30**	**18.63**	**18.48**	**18.98**	**20.06**	**19.13**	**19.08**	**18.94**	**19.95**	**20.84**	**20.82**	**23.17**	**23.39**	**23.28**
3A - Livestock	**11.67**	**11.56**	**11.75**	**11.21**	**11.80**	**12.14**	**11.36**	**11.89**	**11.78**	**12.56**	**12.80**	**13.28**	**13.73**	**14.06**	**13.92**
3A1 - Enteric Fermentation	**6.67**	**6.47**	**6.57**	**6.22**	**6.49**	**6.58**	**6.15**	**6.30**	**6.29**	**6.60**	**6.68**	**6.80**	**6.99**	**7.08**	**7.01**
3A1a - Cattle	6.250	6.051	6.147	5.819	6.051	6.157	5.737	5.895	5.898	6.203	6.282	6.402	6.597	6.691	6.637
3A1ai - Dairy Cows	3.632	3.716	3.823	3.546	3.812	3.871	3.554	3.754	3.779	4.050	4.204	4.364	4.566	4.662	4.685
3A1aii - Other Cattle	2.618	2.335	2.324	2.273	2.240	2.286	2.182	2.141	2.119	2.153	2.078	2.038	2.031	2.030	1.952
3A1c - Sheep	0.168	0.171	0.167	0.150	0.181	0.171	0.155	0.148	0.134	0.139	0.136	0.135	0.127	0.123	0.114
3A1d - Goats	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.011
3A1f - Horses	0.240	0.241	0.242	0.243	0.242	0.243	0.244	0.244	0.245	0.248	0.248	0.248	0.248	0.248	0.248
3A1h - Swine	0.006	0.007	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.005	0.003	0.005	0.004	0.004
3A2 - Manure Management	**5.00**	**5.09**	**5.18**	**4.99**	**5.31**	**5.56**	**5.22**	**5.59**	**5.49**	**5.96**	**6.12**	**6.49**	**6.74**	**6.98**	**6.91**
3A2a - Cattle	4.683	4.767	4.856	4.679	5.002	5.258	4.932	5.302	5.237	5.704	5.886	6.266	6.515	6.763	6.703
3A2ai - Dairy Cows	4.359	4.482	4.595	4.395	4.752	4.990	4.701	5.056	4.984	5.443	5.618	5.979	6.219	6.462	6.405
3A2aii - Other Cattle	0.324	0.285	0.261	0.284	0.250	0.268	0.231	0.246	0.253	0.261	0.268	0.287	0.295	0.302	0.298
3A2c - Sheep	0.018	0.019	0.018	0.017	0.020	0.019	0.017	0.016	0.015	0.015	0.015	0.015	0.014	0.013	0.013
3A2d - Goats	0.000	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
3A2f - Horses	0.035	0.035	0.035	0.035	0.035	0.027	0.027	0.027	0.028	0.027	0.021	0.022	0.022	0.022	0.022
3A2h - Swine	0.068	0.076	0.095	0.092	0.091	0.090	0.079	0.079	0.071	0.067	0.053	0.040	0.055	0.052	0.052
3A2i - Poultry	0.195	0.190	0.179	0.164	0.165	0.162	0.160	0.163	0.140	0.146	0.143	0.142	0.137	0.129	0.116
3B - Land	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**
3B1 - Forest Land	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**
3C - Aggregate Sources and Non-CO2 Emissions Sources on Land	**7.26**	**6.55**	**6.69**	**7.08**	**6.99**	**7.73**	**7.58**	**7.00**	**6.97**	**7.19**	**7.86**	**7.35**	**9.25**	**9.14**	**9.17**
3C1 - Emissions from Biomass Burning	**0.12**	**0.11**	**0.11**	**0.11**	**0.11**	**0.11**	**0.10**	**0.09**	**0.09**	**0.09**	**0.09**	**0.08**	**0.08**	**0.08**	**0.08**
3C1b - Biomass Burning in Croplands	0.124	0.113	0.106	0.113	0.110	0.106	0.100	0.087	0.090	0.089	0.094	0.078	0.079	0.082	0.084
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	**5.20**	**4.69**	**4.73**	**4.99**	**4.85**	**5.28**	**5.15**	**4.65**	**4.74**	**4.84**	**5.28**	**5.04**	**6.38**	**6.29**	**6.24**
3C5 - Indirect N2O Emissions from Managed Soils	**1.44**	**1.29**	**1.33**	**1.45**	**1.37**	**1.59**	**1.54**	**1.38**	**1.42**	**1.44**	**1.66**	**1.59**	**2.01**	**2.00**	**2.00**

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	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
3C7 - Rice Cultivations	0.41	0.36	0.41	0.45	0.50	0.48	0.52	0.54	0.47	0.52	0.57	0.49	0.55	0.53	0.61
4 - Waste	9.42	9.21	9.47	9.59	9.67	9.25	9.19	9.19	9.40	9.46	9.31	9.43	9.36	9.46	9.44
4A - Solid Waste Disposal	6.26	5.99	6.21	6.28	6.30	5.88	5.77	5.72	5.91	5.86	5.64	5.70	5.62	5.67	5.62
4A1 - Managed Waste Disposal Sites	6.26	5.99	6.21	6.28	6.30	5.88	5.77	5.72	5.91	5.86	5.64	5.70	5.62	5.67	5.62
4D - Wastewater Treatment and Discharge	3.17	3.23	3.26	3.31	3.38	3.37	3.41	3.47	3.49	3.60	3.66	3.72	3.74	3.79	3.82
4D1 - Domestic Wastewater Treatment and Discharge	2.83	2.91	2.96	2.99	3.03	3.04	3.07	3.12	3.17	3.24	3.28	3.36	3.33	3.40	3.43
4D2 - Industrial Wastewater Treatment and Discharge	0.34	0.32	0.31	0.32	0.34	0.33	0.35	0.35	0.33	0.36	0.38	0.36	0.41	0.39	0.40

Summary of Categories Included in the Inventory.

(using IPCC Second Assessement Report's GWPs)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross California Emissions	433.29	416.94	418.71	415.42	427.61	416.97	414.58	432.89	449.05	456.50	457.29	473.49	468.54	467.42	484.40
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	426.60	410.40	412.38	409.39	421.81	411.41	409.17	427.51	443.86	451.32	452.27	468.66	463.84	462.75	479.74

Categories Excluded from the Inventory.

(CO2 equivalence based upon IPCC Second Assessement Report's Global Warming Potentials)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1 - Energy	59.02	53.00	45.38	46.22	52.91	55.13	56.51	48.61	48.37	50.47	55.52	51.08	53.06	40.80	44.16
1A - Fuel Combustion Activities	59.02	53.00	45.38	46.22	52.91	55.13	56.51	48.61	48.37	50.47	55.52	51.08	53.06	40.80	44.16
1A3 - Transport	59.02	53.00	45.38	46.22	52.91	55.13	56.51	48.61	48.37	50.47	55.52	51.08	53.06	40.80	44.16
1A3a - Civil Aviation	33.954	32.419	31.597	32.948	36.569	34.993	38.210	38.275	39.121	36.626	38.582	35.536	38.428	30.843	32.916
1A3ai - International Aviation (International Bunkers)	14.597	13.852	13.324	13.707	15.156	14.611	15.905	15.809	16.152	15.124	15.787	14.900	15.681	12.680	13.483
1A3aii - Domestic Aviation	19.357	18.567	18.274	19.241	21.413	20.382	22.305	22.466	22.968	21.502	22.795	20.636	22.748	18.163	19.433
1A3d - Water-borne Navigation	25.062	20.579	13.787	13.269	16.342	20.133	18.304	10.332	9.246	13.848	16.941	15.543	14.633	9.953	11.242
1A3di - International Water-borne Navigation (International Bunkers)	25.062	20.579	13.787	13.269	16.342	20.133	18.304	10.332	9.246	13.848	16.941	15.543	14.633	9.953	11.242

Summary of Categories Excluded from the Inventory.

(using IPCC Second Assessement Report's GWPs)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross California Emissions	59.02	53.00	45.38	46.22	52.91	55.13	56.51	48.61	48.37	50.47	55.52	51.08	53.06	40.80	44.16
Net California Emissions	59.02	53.00	45.38	46.22	52.91	55.13	56.51	48.61	48.37	50.47	55.52	51.08	53.06	40.80	44.16