

California Methane Inventory for 2000-2015 — by IPCC Category

million tonnes of CO2 equivalent - (based upon IPCC Fourth Assessment Report's 100-yr Global Warming Potentials)

Included Emissions	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1 - Energy	6.1	6.1	6.4	6.2	6.4	6.6	6.8	6.6	6.6	6.6	6.6	6.9	6.7	7.0	7.2	7.3
1A - Fuel Combustion Activities	0.86	0.81	0.74	0.71	0.81	0.73	0.67	0.63	0.59	0.57	0.55	0.52	0.50	0.51	0.48	0.45
1A1 - Energy Industries	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.18	0.17	0.15
1A1a - Main Activity Electricity and Heat Production	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.12	0.11	0.12	0.13	0.13	0.13
1A1ai - Electricity Generation	0.074	0.075	0.076	0.077	0.077	0.075	0.076	0.078	0.080	0.091	0.085	0.074	0.085	0.100	0.093	0.087
1A1aii - Combined Heat and Power Generation (CHP)	0.046	0.047	0.039	0.040	0.041	0.043	0.042	0.041	0.038	0.036	0.033	0.037	0.033	0.035	0.033	0.033
1A1b - Petroleum Refining	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
1A1c - Manufacture of Solid Fuels and Other Energy Industries	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1A1cii - Other Energy Industries	0.008	0.009	0.008	0.009	0.009	0.008	0.007	0.007	0.008	0.007	0.007	0.007	0.007	0.008	0.008	0.008
1A2 - Manufacturing Industries and Construction	0.05	0.06	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04
1A2c - Chemicals	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	0.00
1A2d - Pulp, Paper and Print	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	0.00
1A2e - Food Processing, Beverages and Tobacco	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	0.00
1A2f - Non-Metallic Minerals	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1A2g - Transport Equipment	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	0.00
1A2h - Machinery	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	0.00
1A2i - Mining (excluding fuels) and Quarrying	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	0.00
1A2j - Wood and Wood Products	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	0.00
1A2k - Construction	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	0.00
1A2l - Textile and Leather	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	0.00
1A2m - Non-specified Industry.	0.03	0.04	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
1A3 - Transport	0.58	0.52	0.48	0.44	0.53	0.47	0.42	0.38	0.33	0.31	0.29	0.27	0.24	0.23	0.21	0.20
1A3a - Civil Aviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1A3aii - Domestic Aviation	0.006	0.006	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
1A3b - Road Transportation	0.57	0.51	0.46	0.42	0.52	0.45	0.40	0.36	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.19
1A3bi - Cars	0.276	0.240	0.213	0.183	0.223	0.183	0.159	0.137	0.117	0.107	0.099	0.088	0.079	0.072	0.065	0.060
1A3bii - Light-duty Trucks	0.214	0.193	0.174	0.163	0.205	0.181	0.162	0.144	0.129	0.119	0.113	0.104	0.096	0.089	0.083	0.077
1A3biii - Heavy-duty Trucks and Buses	0.072	0.067	0.065	0.063	0.076	0.070	0.065	0.060	0.053	0.047	0.044	0.040	0.036	0.031	0.026	0.023
1A3biv - Motorcycles	0.007	0.009	0.010	0.011	0.013	0.014	0.016	0.016	0.018	0.019	0.019	0.019	0.019	0.020	0.021	0.022
1A3c - Railways	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	0.00
1A3d - Water-borne Navigation	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	0.00
1A3di - International Water-borne Navigation (International Bunkers)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
1A3dii - Domestic Water-borne Navigation	0.002	0.002	0.002	0.003	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002

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Included Emissions	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1A3e - Other Transportation	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	0.00
1A3eii - Off-road	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.003
1A4 - Other Sectors	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.05	0.06	0.06	0.06
1A4a - Commercial/Institutional	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1A4b - Residential	0.04	0.04	0.04	0.04	0.05	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
1A4c - Agriculture/Forestry/Fishing/Fish Farms	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	0.00
1B - Fugitive Emissions from Fuels	5.25	5.34	5.70	5.48	5.57	5.92	6.13	5.93	5.99	5.99	6.08	6.35	6.21	6.53	6.69	6.81
1B1 - Solid Fuels	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.01
1B2 - Oil and Natural Gas	5.22	5.31	5.66	5.45	5.53	5.89	6.10	5.90	5.96	5.97	6.05	6.24	6.19	6.38	6.54	6.67
1B2a - Oil	0.09	0.06	0.06	0.05	0.04	0.05	0.05	0.05	0.05	0.06	0.04	0.07	0.05	0.04	0.05	0.05
1B2ai - Venting	0.026	0.026	0.026	0.027	0.026	0.027	0.028	0.028	0.027	0.025	0.025	0.051	0.035	0.001	0.001	0.001
1B2aii - Flaring	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.008	0.006	0.007	0.006	0.005
1B2aiii - All Other	0.064	0.030	0.035	0.021	0.014	0.023	0.024	0.023	0.019	0.036	0.012	0.013	0.013	0.036	0.041	0.037
1B2b - Natural Gas [1]	3.63	3.69	4.02	3.78	3.85	3.89	4.03	4.00	4.07	4.11	4.07	4.07	3.97	3.98	3.99	3.99
1B3 - Geothermal Energy Production										0.00	0.00	0.09	0.00	0.13	0.13	0.13
3 - Agriculture, Forestry and Other Land Use	19.5	19.5	20.8	21.2	20.7	21.1	21.4	23.7	23.7	23.1	23.7	23.6	24.2	23.3	23.3	22.7
3A - Livestock	18.24	18.48	19.67	20.07	19.37	19.96	20.26	22.56	22.60	21.91	22.51	22.36	22.93	22.01	22.31	21.77
3A1 - Enteric Fermentation	10.36	10.25	10.91	11.00	10.77	11.08	11.13	12.31	12.04	11.65	12.13	11.98	12.10	11.78	11.85	11.54
3A1a - Cattle	10.01	9.89	10.54	10.60	10.34	10.60	10.66	11.84	11.57	11.17	11.65	11.49	11.61	11.29	11.36	11.36
3A1ai - Dairy Cows	6.743	6.665	7.331	7.417	7.217	7.392	7.547	8.461	8.360	7.995	8.496	8.436	8.488	8.225	8.240	8.081
3A1aii - Other Cattle	3.264	3.221	3.210	3.185	3.125	3.212	3.110	3.376	3.210	3.173	3.154	3.054	3.121	3.070	3.124	2.971
3A1c - Sheep	0.16	0.16	0.15	0.15	0.14	0.14	0.13	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.12	0.12
3A1d - Goats	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
3A1f - Horses	0.18	0.19	0.20	0.24	0.27	0.31	0.32	0.32	0.32	0.33	0.34	0.35	0.35	0.35	0.35	0.35
3A1h - Swine	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3A2 - Manure Management	7.88	8.23	8.76	9.06	8.60	8.89	9.13	10.25	10.56	10.26	10.38	10.38	10.84	10.23	10.46	10.23
3A2a - Cattle	7.60	7.97	8.48	8.80	8.34	8.62	8.87	9.99	10.33	10.02	10.14	10.14	10.60	10.01	10.26	10.26
3A2ai - Dairy Cows	7.482	7.849	8.360	8.673	8.217	8.498	8.746	9.847	10.202	9.889	10.012	10.012	10.467	9.881	10.126	9.891
3A2aii - Other Cattle	0.123	0.122	0.124	0.126	0.123	0.127	0.126	0.138	0.132	0.130	0.128	0.125	0.129	0.127	0.130	0.130
3A2c - Sheep	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
3A2d - Goats	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	0.00
3A2f - Horses	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
3A2h - Swine	0.06	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
3A2i - Poultry	0.15	0.15	0.14	0.14	0.12	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.10	0.09	0.09

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Included Emissions	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
3C - Aggregate Sources and Non-CO₂ Emissions Sources on Land	1.21	1.04	1.17	1.12	1.30	1.16	1.16	1.17	1.15	1.23	1.22	1.28	1.25	1.25	0.98	0.94
3C1 - Emissions from Biomass Burning	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
3C1b - Biomass Burning in Croplands	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
3C7 - Rice Cultivations	1.19	1.02	1.15	1.10	1.28	1.14	1.13	1.15	1.12	1.20	1.20	1.26	1.22	1.22	0.96	0.91
4 - Waste	8.6	8.7	8.7	8.8	8.7	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.5	9.5	9.6	9.7
4A - Solid Waste Disposal	7.21	7.36	7.31	7.42	7.41	7.59	7.65	7.71	7.88	8.02	8.11	8.19	8.20	8.22	8.28	8.40
4A1 - Managed Waste Disposal Sites	7.21	7.36	7.31	7.42	7.41	7.59	7.65	7.71	7.88	8.02	8.11	8.19	8.20	8.22	8.28	8.40
4B - Biological Treatment of Solid Waste	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.21	0.22
4D - Wastewater Treatment and Discharge	1.26	1.24	1.25	1.22	1.21	1.21	1.20	1.20	1.17	1.15	1.14	1.14	1.13	1.11	1.10	1.04
4D1 - Domestic Wastewater Treatment and Discharge	0.93	0.92	0.91	0.90	0.89	0.89	0.87	0.87	0.85	0.84	0.83	0.82	0.81	0.80	0.79	0.77
4D2 - Industrial Wastewater Treatment and Discharge	0.33	0.31	0.34	0.32	0.32	0.32	0.33	0.34	0.32	0.31	0.31	0.32	0.32	0.31	0.31	0.27
Summary for Included Emissions	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Included Inventory CH ₄ Emissions	34.1	34.4	36.0	36.1	35.8	36.7	37.2	39.4	39.5	39.0	39.8	40.0	40.4	39.8	40.1	39.6

[1] The exceptional Aliso Canyon natural gas leak event released 1.96 MMTCO₂e of unanticipated emissions in calendar year 2015 and an additional 0.52 MMTCO₂e in 2016. These emissions will be mitigated in the future according to legal settlement and are presented alongside but tracked separately from routine inventory emissions.

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1 - Energy	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1A - Fuel Combustion Activities	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
1A3 - Transport	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
1A3a - Civil Aviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1A3ai - International Aviation (International Bunkers)	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004
1A3aia - Domestic Aviation	0.003	0.003	0.004	0.003	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
1A3d - Water-borne Navigation	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
1A3di - International Water-borne Navigation (International Bunkers)	0.016	0.011	0.014	0.009	0.011	0.015	0.016	0.018	0.018	0.018	0.020	0.017	0.017	0.017	0.016	0.016
1A5 - Non-Specified	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	0.00
1A5b - Mobile	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	0.00
1A5bi - Mobile (Aviation Component)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
1B - Fugitive Emissions from Fuels	2.75	2.74	2.75	2.75	2.76	2.77	2.79	2.82	2.82	2.81	2.80	2.80	2.80	2.77	2.79	2.79
1B2 - Oil and Natural Gas	2.75	2.74	2.75	2.75	2.76	2.77	2.79	2.82	2.82	2.81	2.80	2.80	2.80	2.77	2.79	2.79
Summary for Excluded Emissions	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
International and Interstate CH4 Emissions	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8

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Forested Lands & Wood Products 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

This section of the inventory is currently under development