

California Methane Inventory for 2000-2021 — 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	2016	2017	2018	2019	2020	2021
1 - Energy	6.5	6.6	6.9	6.7	6.8	7.0	7.2	7.0	7.0	7.0	7.0	7.3	7.1	7.3	7.2	7.2	7.1	7.2	7.3	7.2	7.0	7.0
1A - Fuel Combustion Activities	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
1A1 - Energy Industries	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1										
1A1a - Main Activity Electricity and Heat Production	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
1A1ai - Electricity Generation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1A1aii - Combined Heat and Power Generation (CHP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A1b - Petroleum Refining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A1c - Manufacture of Solid Fuels and Other Energy Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A1ci - Other Energy Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2 - Manufacturing Industries and Construction	0.1	0.1	0.0	0.1	0.1																	
1A2d - Pulp, Paper and Print	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2e - Food Processing, Beverages and Tobacco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2f - Non-Metallic Minerals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2g - Transport Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2h - Machinery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2i - Mining (excluding fuels) and Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2j - Wood and Wood Products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2k - Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2l - Textile and Leather	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A2m - Non-specified Industry.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3 - Transport	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	
1A3a - Civil Aviation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3ai - Domestic Aviation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3b - Road Transportation	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1A3bi - Cars	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1A3bii - Light-duty Trucks	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1A3biii - Heavy-duty Trucks and Buses	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3biv - Motorcycles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3c - Railways	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3d - Water-borne Navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3di - International Water-borne Navigation (International Bunkers)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3dii - Domestic Water-borne Navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3e - Other Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3ei - Off-road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A4 - Other Sectors	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0							
1A4a - Commercial/Institutional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
1A4b - Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1A4c - Agriculture/Forestry/Fishing/Fish Farms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1B - Fugitive Emissions from Fuels	5.6	5.7	6.0	5.8	5.9	6.2	6.5	6.3	6.4	6.3	6.4	6.7	6.5	6.7	6.7	6.7	6.6	6.8	6.9	6.8	6.6	6.6	
1B1 - Solid Fuels	0.0																						
1B2 - Oil and Natural Gas	5.5	5.6	6.0	5.8	5.9	6.2	6.4	6.2	6.3	6.3	6.4	6.6	6.4	6.5	6.5	6.6	6.5	6.7	6.7	6.7	6.5	6.5	
1B2a - Oil	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0
1B2ai - Venting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1B2aii - Flaring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1B2aiii - All Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
1B2b - Natural Gas	4.4	4.5	4.8	4.6	4.7	4.7	4.9	4.8	4.9	5.0	4.9	4.9	4.8	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.1	5.1
1B3 - Geothermal Energy Production	0.0	0.1	0.2	0.1																			
3 - Agriculture, Forestry and Other Land Use	18.5	18.7	19.9	20.4	19.7	20.3	20.5	22.9	22.8	22.2	22.8	22.7	23.2	22.7	22.7	22.1	22.0	22.0	22.0	21.8	21.7	21.0	
3A - Livestock	17.7	18.0	19.1	19.5	18.8	19.4	19.7	22.0	22.0	21.4	21.9	21.8	22.4	21.8	21.9	21.4	21.1	21.3	21.2	21.0	20.9	20.2	
3A1 - Enteric Fermentation	9.9	9.8	10.4	10.5	10.3	10.5	10.6	11.7	11.5	11.1	11.6	11.4	11.5	11.2	11.3	11.0	10.9	11.1	11.1	11.0	11.0	11.0	
3A1a - Cattle	9.5	9.4	10.0	10.1	9.8	10.1	10.1	11.2	11.0	10.6	11.1	10.9	11.0	10.7	10.8	10.4	10.4	10.7	10.6	10.5	10.5	10.5	
3A1ai - Dairy Cows	6.4	6.3	7.0	7.0	6.9	7.0	7.2	8.0	7.9	7.6	8.1	8.0	8.1	7.8	7.8	7.6	7.6	7.7	7.6	7.6	7.6	7.5	
3A1aii - Other Cattle	3.1	3.1	3.0	3.0	3.0	3.1	3.0	3.2	3.0	3.0	3.0	2.9	3.0	3.0	2.9	2.8	2.8	3.0	3.0	2.9	3.0	3.0	
3A1c - Sheep	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
3A1d - Goats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3A1f - Horses	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
3A1h - Swine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3A2 - Manure Management	7.9	8.2	8.8	9.1	8.6	8.9	9.1	10.3	10.6	10.3	10.4	10.4	10.8	10.5	10.6	10.5	10.2	10.2	10.1	10.0	9.9	9.2	
3A2a - Cattle	7.6	8.0	8.5	8.8	8.3	8.6	8.9	10.0	10.3	10.0	10.1	10.1	10.6	10.3	10.4	10.0	10.0	10.0	9.9	9.8	9.7	9.0	
3A2ai - Dairy Cows	7.5	7.8	8.4	8.7	8.2	8.5	8.7	9.8	10.2	9.9	10.0	10.0	10.5	10.2	10.3	10.1	9.8	9.9	9.7	9.7	9.6	8.9	
3A2aii - Other Cattle	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
3A2c - Sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3A2d - Goats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3A2f - Horses	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
3A2h - Swine	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3A2i - Poultry	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
3C - Aggregate Sources and Non-CO₂ Emissions Sources on Land	0.7	0.7	0.8	0.8	0.8	0.9	0.7	1.0	0.7	0.8	0.8	0.9	0.9	0.9	0.8	0.7	0.9	0.7	0.8	0.8	0.8		
3C1 - Emissions from Biomass Burning	0.0																						
3C1b - Biomass Burning in Croplands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3C7 - Rice Cultivations	0.7	0.7	0.8	0.8	0.8	0.9	0.7	0.9	0.7	0.8	0.8	0.9	0.8	0.9	0.8	0.7	0.9	0.6	0.7	0.8	0.8		

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Methane

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4 - Waste	8.1	8.2	8.3	8.4	8.4	8.6	8.6	8.7	8.8	8.8	8.9	9.3	9.5	9.4	9.2	9.1	9.0	9.2	9.3	9.4	9.6	9.4
4A - Solid Waste Disposal	6.6	6.8	6.8	6.9	6.9	7.1	7.2	7.2	7.3	7.4	7.5	7.9	8.1	8.0	7.8	7.8	7.6	7.8	7.9	8.0	8.2	8.0
4A1 - Managed Waste Disposal Sites	6.6	6.8	6.8	6.9	6.9	7.1	7.2	7.2	7.3	7.4	7.5	7.9	8.1	8.0	7.8	7.8	7.6	7.8	7.9	8.0	8.2	8.0
4B - Biological Treatment of Solid Waste	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
4D - Wastewater Treatment and Discharge	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1
4D1 - Domestic Wastewater Treatment and Discharge	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8
4D2 - Industrial Wastewater Treatment and Discharge	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Summary for Included Emissions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
California CH₄ Emissions	33.1	33.6	35.1	35.4	34.8	35.9	36.3	38.6	38.6	38.0	38.7	39.3	39.8	39.4	39.2	38.5	38.1	38.5	38.6	38.4	38.3	37.4

Methane

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1 - Energy	0.4	0.6	0.6	0.6	0.1	0.1	0.6	0.6	0.6	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3 - Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3a - Civil Aviation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3ai - International Aviation (International Bunkers)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3aii - Domestic Aviation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3d - Water-borne Navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A3di - International Water-borne Navigation (International Bunkers)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A5 - Non-Specified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A5b - Mobile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1A5bi - Mobile (Aviation Component)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1B - Fugitive Emissions from Fuels	0.4	0.5	0.6	0.6	0.1	0.1	0.6	0.6	0.6	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1B2 - Oil and Natural Gas	0.4	0.5	0.6	0.6	0.1	0.1	0.6	0.6	0.6	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Summary for Excluded Emissions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Excluded CH4 Emissions	0.4	0.6	0.6	0.6	0.1	0.1	0.6	0.6	0.6	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

California Methane Inventory for 2000-2021 — by IPCC Category

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

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

This section of the inventory is currently under development