

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 | 7.0 | 7.1 | 7.4 | 7.2 | 7.2 | 7.5 | 7.7 | 7.5 | 7.5 | 7.5 | 7.5 | 7.7 | 7.6 | 7.7 | 7.6 | 7.6 |
| 1A - Fuel Combustion Activities | 0.95 | 0.92 | 0.88 | 0.86 | 0.83 | 0.78 | 0.74 | 0.70 | 0.66 | 0.64 | 0.62 | 0.58 | 0.56 | 0.60 | 0.57 | 0.51 |
| 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 | 0.14 | 0.15 | 0.20 | 0.20 | 0.17 |
| 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 | 0.17 | 0.17 | 0.17 |
| 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 | 0.067 | 0.078 | 0.123 | 0.123 | 0.106 |
| 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 | 0.041 | 0.044 | 0.044 | 0.043 | 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 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| 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 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 |
| 1A3 - Transport | 0.67 | 0.64 | 0.61 | 0.59 | 0.56 | 0.52 | 0.48 | 0.45 | 0.41 | 0.38 | 0.36 | 0.33 | 0.31 | 0.29 | 0.27 | 0.26 |
| 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 | 0.66 | 0.62 | 0.60 | 0.57 | 0.55 | 0.50 | 0.47 | 0.43 | 0.39 | 0.37 | 0.35 | 0.32 | 0.30 | 0.28 | 0.26 | 0.26 |
| 1A3bi - Cars | 0.338 | 0.313 | 0.297 | 0.274 | 0.257 | 0.230 | 0.210 | 0.190 | 0.170 | 0.158 | 0.148 | 0.135 | 0.124 | 0.115 | 0.104 | 0.095 |
| 1A3bii - Light-duty Trucks | 0.248 | 0.236 | 0.228 | 0.227 | 0.216 | 0.201 | 0.187 | 0.173 | 0.158 | 0.148 | 0.142 | 0.133 | 0.124 | 0.116 | 0.109 | 0.103 |
| 1A3biii - Heavy-duty Trucks and Buses | 0.062 | 0.058 | 0.056 | 0.055 | 0.053 | 0.050 | 0.048 | 0.046 | 0.040 | 0.036 | 0.033 | 0.031 | 0.028 | 0.025 | 0.023 | 0.021 |
| 1A3biv - Motorcycles | 0.012 | 0.015 | 0.017 | 0.018 | 0.018 | 0.020 | 0.022 | 0.023 | 0.024 | 0.023 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 | 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 | 0.001 | 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 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.002 |

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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 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 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 | 0.04 |
| 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 | 0.05 | 0.05 | 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 | 6.06 | 6.17 | 6.53 | 6.30 | 6.39 | 6.69 | 6.99 | 6.78 | 6.86 | 6.82 | 6.83 | 7.14 | 7.02 | 7.09 | 7.06 | 7.14 |
| 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 | 0.02 | 0.02 | 0.02 |
| 1B2 - Oil and Natural Gas | 6.03 | 6.14 | 6.49 | 6.27 | 6.36 | 6.66 | 6.96 | 6.74 | 6.83 | 6.80 | 6.81 | 6.99 | 6.85 | 6.94 | 6.91 | 6.99 |
| 1B2a - Oil | 0.09 | 0.06 | 0.06 | 0.05 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 | 0.04 | 0.12 | 0.08 | 0.04 | 0.03 | 0.03 |
| 1B2ai - Venting | 0.026 | 0.026 | 0.026 | 0.027 | 0.026 | 0.027 | 0.028 | 0.028 | 0.027 | 0.025 | 0.025 | 0.004 | 0.003 | 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 | 0.002 | 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 | 0.107 | 0.075 | 0.034 | 0.026 | 0.036 |
| 1B2b - Natural Gas | 4.41 | 4.48 | 4.82 | 4.58 | 4.66 | 4.71 | 4.87 | 4.84 | 4.92 | 4.97 | 4.94 | 4.94 | 4.84 | 4.85 | 4.87 | 4.87 |
| 1B3 - Geothermal Energy Production | | | | | | | | | | 0.00 | 0.00 | 0.13 | 0.15 | 0.13 | 0.13 | 0.13 |
| 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 | 22.3 | 22.5 | 21.9 |
| 3A - Livestock | 17.74 | 17.99 | 19.14 | 19.54 | 18.85 | 19.43 | 19.73 | 21.97 | 22.02 | 21.35 | 21.93 | 21.78 | 22.35 | 21.44 | 21.74 | 21.18 |
| 3A1 - Enteric Fermentation | 9.86 | 9.76 | 10.39 | 10.47 | 10.25 | 10.55 | 10.60 | 11.71 | 11.46 | 11.10 | 11.55 | 11.40 | 11.52 | 11.22 | 11.28 | 10.95 |
| 3A1a - Cattle | 9.51 | 9.39 | 10.01 | 10.07 | 9.83 | 10.07 | 10.12 | 11.25 | 10.99 | 10.61 | 11.07 | 10.92 | 11.03 | 10.73 | 10.79 | 10.79 |
| 3A1ai - Dairy Cows | 6.405 | 6.332 | 6.964 | 7.046 | 6.856 | 7.022 | 7.170 | 8.038 | 7.942 | 7.595 | 8.071 | 8.015 | 8.064 | 7.814 | 7.828 | 7.645 |
| 3A1aii - Other Cattle | 3.101 | 3.060 | 3.049 | 3.025 | 2.969 | 3.051 | 2.954 | 3.208 | 3.050 | 3.014 | 2.996 | 2.901 | 2.965 | 2.916 | 2.967 | 2.822 |
| 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 | 9.890 |
| 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 | 0.129 |
| 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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|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 3C - Aggregate Sources and Non-CO2 Emissions Sources on Land | 0.73 | 0.75 | 0.78 | 0.83 | 0.81 | 0.88 | 0.73 | 0.96 | 0.74 | 0.82 | 0.84 | 0.88 | 0.86 | 0.89 | 0.81 | 0.70 |
| 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 | 0.70 | 0.73 | 0.76 | 0.81 | 0.79 | 0.86 | 0.71 | 0.94 | 0.71 | 0.80 | 0.81 | 0.85 | 0.83 | 0.86 | 0.78 | 0.67 |
| 4 - Waste | 8.5 | 8.7 | 8.6 | 8.7 | 8.7 | 8.9 | 8.9 | 9.0 | 9.1 | 9.2 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.4 |
| 4A - Solid Waste Disposal | 7.18 | 7.32 | 7.27 | 7.39 | 7.38 | 7.53 | 7.58 | 7.65 | 7.78 | 7.87 | 7.94 | 8.00 | 7.93 | 7.96 | 8.00 | 8.06 |
| 4A1 - Managed Waste Disposal Sites | 7.18 | 7.32 | 7.27 | 7.39 | 7.38 | 7.53 | 7.58 | 7.65 | 7.78 | 7.87 | 7.94 | 8.00 | 7.93 | 7.96 | 8.00 | 8.06 |
| 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 | 1.08 |
| 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 | 0.31 |

Summary for Included Emissions

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| California CH4 Emissions | 34.0 | 34.5 | 36.0 | 36.3 | 35.6 | 36.7 | 37.1 | 39.4 | 39.4 | 38.8 | 39.5 | 39.7 | 40.0 | 39.3 | 39.5 | 38.9 | 39.2 | 39.3 | 39.4 | 39.3 |