California Environmental Protection Agency
Air Resources Board

California Greenhouse Gas Inventory for 2000-2015 — by Category as Defined in the 2008 Scoping Plan

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
Transportation	**176.49**	**176.67**	**183.66**	**181.03**	**182.68**	**184.48**	**184.46**	**184.41**	**173.18**	**166.37**	**163.01**	**159.68**	**159.44**	**158.14**	**160.03**	**164.63**
On Road	***162.35***	***162.70***	***168.72***	***165.43***	***166.56***	***167.36***	***166.91***	***167.00***	***157.39***	***152.85***	***149.03***	***145.92***	***145.67***	***143.86***	***144.98***	***149.42***
Passenger Vehicles	125.72	126.25	131.07	127.88	127.32	127.20	126.46	125.83	119.42	117.97	114.66	111.96	112.40	111.23	112.07	117.01
Heavy Duty Vehicles	36.63	36.45	37.65	37.55	39.24	40.16	40.45	41.17	37.97	34.88	34.37	33.96	33.27	32.63	32.90	32.41
Ships & Commercial Boats	***3.50***	***3.32***	***3.63***	***3.79***	***3.80***	***4.05***	***4.09***	***4.26***	***4.01***	***3.64***	***3.71***	***3.56***	***3.60***	***3.86***	***3.95***	***3.89***
Aviation (Intrastate)	***4.15***	***4.07***	***4.12***	***4.25***	***4.49***	***4.49***	***4.56***	***4.97***	***4.50***	***4.03***	***3.84***	***3.71***	***3.75***	***3.91***	***3.89***	***4.20***
Rail	***1.88***	***1.89***	***2.50***	***2.86***	***2.91***	***3.34***	***3.53***	***3.17***	***2.38***	***1.95***	***2.31***	***2.64***	***2.47***	***2.40***	***2.75***	***2.42***
Off Road [1]	***2.63***	***2.79***	***2.77***	***2.84***	***3.03***	***3.22***	***3.32***	***3.18***	***2.82***	***2.25***	***2.03***	***2.13***	***2.23***	***2.33***	***2.43***	***2.53***
Unspecified	***1.98***	***1.90***	***1.93***	***1.85***	***1.89***	***2.01***	***2.05***	***1.84***	***2.09***	***1.66***	***2.09***	***1.72***	***1.71***	***1.77***	***2.04***	***2.16***
Industrial	**96.24**	**94.42**	**95.69**	**94.82**	**97.31**	**95.45**	**92.90**	**89.65**	**89.97**	**87.45**	**91.01**	**90.65**	**90.90**	**93.48**	**93.77**	**91.71**
Refineries and Hydrogen Production	***28.52***	***29.10***	***29.25***	***29.89***	***29.13***	***29.81***	***29.70***	***29.27***	***28.48***	***28.37***	***30.46***	***30.12***	***29.88***	***29.22***	***29.40***	***28.21***
General Fuel Use	***20.25***	***19.08***	***20.32***	***16.53***	***17.02***	***16.00***	***15.96***	***14.77***	***15.99***	***15.56***	***17.93***	***18.78***	***18.91***	***19.31***	***19.87***	***19.65***
Natural Gas	16.82	14.62	15.18	11.97	12.80	12.72	12.38	11.56	12.37	11.46	13.46	14.50	14.48	14.36	15.56	15.08
Other Fuels	3.43	4.46	5.13	4.56	4.22	3.28	3.57	3.20	3.62	4.11	4.47	4.28	4.43	4.94	4.31	4.57
Oil & Gas: Production & Processing [2]	***19.08***	***19.36***	***18.12***	***20.68***	***20.87***	***19.60***	***17.48***	***17.56***	***18.85***	***17.75***	***16.90***	***16.88***	***16.93***	***19.27***	***19.62***	***19.83***
Fuel Use	17.53	17.76	16.51	19.03	19.20	17.91	15.75	15.78	17.05	15.92	15.01	14.91	14.87	16.99	17.18	17.22
Fugitive Emissions	1.55	1.60	1.62	1.65	1.67	1.69	1.73	1.77	1.81	1.83	1.89	1.97	2.07	2.28	2.44	2.60
Cement Plants	***9.50***	***9.28***	***9.83***	***9.90***	***10.08***	***10.03***	***9.76***	***9.25***	***8.64***	***5.73***	***5.57***	***6.14***	***6.92***	***7.20***	***7.61***	***7.56***
Clinker Production	5.52	5.28	5.82	5.87	6.03	5.96	5.81	5.66	5.28	3.60	3.46	4.08	4.65	4.93	5.27	5.17
Fuel Use	3.98	4.00	4.01	4.03	4.05	4.06	3.95	3.59	3.35	2.13	2.11	2.07	2.26	2.28	2.34	2.39
Cogeneration Heat Output	***11.69***	***10.48***	***10.65***	***10.59***	***12.92***	***12.41***	***12.16***	***11.15***	***10.40***	***12.56***	***12.61***	***11.15***	***10.81***	***10.99***	***9.64***	***8.98***
Other Fugitive and Process Emissions	***7.19***	***7.12***	***7.51***	***7.22***	***7.30***	***7.61***	***7.84***	***7.65***	***7.61***	***7.47***	***7.54***	***7.58***	***7.45***	***7.49***	***7.63***	***7.48***
Natural Gas Transmission & Distribution [5]	3.52	3.58	3.90	3.66	3.73	3.76	3.90	3.87	3.95	3.98	3.94	3.92	3.88	3.82	3.87	3.94
Manufacturing	0.29	0.29	0.24	0.24	0.25	0.25	0.23	0.23	0.20	0.17	0.20	0.18	0.18	0.18	0.16	0.18
Wastewater Treatment	1.86	1.84	1.86	1.84	1.84	1.83	1.84	1.85	1.83	1.81	1.86	1.88	1.88	1.88	1.87	1.82
Other	1.52	1.43	1.51	1.48	1.48	1.76	1.86	1.70	1.64	1.50	1.54	1.59	1.51	1.61	1.73	1.54
Electric Power	**104.84**	**122.00**	**108.64**	**112.61**	**115.20**	**107.85**	**104.53**	**113.93**	**120.14**	**101.37**	**90.34**	**88.06**	**95.09**	**89.65**	**88.24**	**83.67**
In-State Generation	***58.94***	***62.98***	***49.68***	***48.05***	***49.15***	***45.05***	***49.85***	***54.12***	***54.32***	***53.33***	***46.75***	***41.20***	***51.02***	***49.47***	***51.72***	***49.93***
Natural Gas	50.92	55.46	42.17	40.92	42.40	38.11	43.07	47.12	48.02	46.08	40.59	35.92	45.77	45.66	46.43	45.16
Other Fuels	6.84	6.36	6.36	5.98	5.59	5.77	5.63	5.85	5.15	5.90	5.05	4.03	4.44	2.91	4.40	3.65
Fugitive and Process Emissions	1.17	1.16	1.15	1.15	1.16	1.16	1.15	1.16	1.14	1.35	1.10	1.25	0.82	0.90	0.90	1.13
Imported Electricity	***45.90***	***59.02***	***58.96***	***64.56***	***66.04***	***62.80***	***54.68***	***59.81***	***65.82***	***48.04***	***43.59***	***46.86***	***44.07***	***40.17***	***36.51***	***33.74***
Unspecified Imports	14.27	25.42	26.92	32.05	32.92	30.01	27.95	32.73	37.92	14.99	13.45	15.52	17.48	11.82	13.44	11.21
Specified Imports	31.64	33.59	32.04	32.51	33.13	32.79	26.73	27.08	27.90	33.05	30.14	31.34	26.59	28.35	23.07	22.52

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	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Commercial and Residential	**43.18**	**42.08**	**44.06**	**42.53**	**43.79**	**42.25**	**42.94**	**43.15**	**43.52**	**43.63**	**45.05**	**45.50**	**42.89**	**43.54**	**37.37**	**37.92**
Residential Fuel Use	***29.38***	***28.47***	***28.62***	***28.14***	***29.17***	***27.98***	***28.36***	***28.50***	***28.82***	***28.47***	***29.19***	***29.64***	***27.34***	***28.14***	***22.87***	***23.17***
Natural Gas	27.98	27.38	27.49	26.62	27.33	25.93	26.55	26.68	26.62	26.26	26.99	27.51	25.76	26.52	21.58	21.90
Other Fuels	1.41	1.09	1.13	1.52	1.84	2.06	1.81	1.82	2.20	2.21	2.21	2.13	1.58	1.62	1.28	1.27
Commercial Fuel Use	***11.47***	***11.31***	***13.11***	***12.84***	***12.70***	***12.55***	***12.83***	***12.82***	***12.99***	***12.89***	***13.58***	***13.71***	***13.41***	***13.30***	***12.51***	***12.77***
Natural Gas	10.05	10.08	11.88	11.36	11.14	10.92	11.60	11.47	11.14	11.00	11.17	11.33	11.25	11.28	10.39	10.50
Other Fuels	1.42	1.22	1.23	1.48	1.55	1.64	1.24	1.36	1.85	1.88	2.41	2.38	2.16	2.02	2.12	2.26
Commercial Cogeneration Heat Output	***1.09***	***1.05***	***1.06***	***0.26***	***0.62***	***0.40***	***0.42***	***0.49***	***0.37***	***0.92***	***0.92***	***0.78***	***0.76***	***0.71***	***0.58***	***0.56***
Other Commercial and Residential	***1.24***	***1.26***	***1.27***	***1.29***	***1.30***	***1.31***	***1.32***	***1.33***	***1.34***	***1.35***	***1.36***	***1.37***	***1.38***	***1.40***	***1.41***	***1.42***
Agriculture	**31.95**	**31.95**	**34.15**	**34.39**	**33.85**	**34.52**	**35.70**	**36.02**	**36.06**	**33.83**	**34.64**	**35.28**	**36.42**	**34.93**	**36.03**	**34.65**
Livestock	***19.62***	***19.89***	***21.17***	***21.61***	***20.81***	***21.46***	***21.81***	***24.13***	***24.13***	***23.41***	***24.00***	***23.84***	***24.47***	***23.49***	***23.81***	***23.25***
Enteric Fermentation (Digestive Process)	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
Manure Management	9.26	9.64	10.25	10.60	10.04	10.39	10.68	11.82	12.09	11.75	11.86	11.86	12.38	11.71	11.96	11.71
Crop Growing & Harvesting	***8.52***	***8.24***	***8.60***	***8.53***	***8.54***	***8.46***	***8.59***	***8.11***	***7.84***	***7.81***	***7.87***	***7.79***	***8.07***	***7.74***	***7.55***	***7.00***
Fertilizers	6.25	6.25	6.40	6.38	6.23	6.24	6.20	5.96	5.82	5.74	5.78	5.67	5.93	5.65	5.72	5.28
Soil Preparation and Disturbances	2.19	1.93	2.14	2.08	2.24	2.15	2.32	2.08	1.94	2.00	2.01	2.03	2.06	2.01	1.76	1.64
Crop Residue Burning	0.08	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
General Fuel Use	***3.81***	***3.82***	***4.38***	***4.25***	***4.50***	***4.60***	***5.30***	***3.78***	***4.09***	***2.61***	***2.77***	***3.65***	***3.88***	***3.71***	***4.66***	***4.39***
Diesel	2.52	2.69	3.04	3.00	3.17	3.40	3.86	2.68	3.18	1.75	1.96	2.52	2.47	2.53	3.54	3.66
Natural Gas	0.98	0.75	0.94	0.85	0.82	0.70	0.88	0.79	0.75	0.69	0.65	0.66	0.70	0.69	0.63	0.64
Gasoline	0.31	0.38	0.40	0.40	0.50	0.50	0.55	0.31	0.16	0.16	0.16	0.48	0.71	0.49	0.49	0.10
Other Fuels	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High GWP	**7.14**	**7.07**	**7.31**	**7.97**	**8.70**	**9.42**	**10.33**	**11.07**	**11.80**	**12.43**	**13.64**	**14.74**	**15.74**	**16.82**	**17.82**	**19.05**
Ozone Depleting Substance (ODS) Substitutes	***6.10***	***6.23***	***6.52***	***7.20***	***7.95***	***8.75***	***9.64***	***10.43***	***11.27***	***11.96***	***13.20***	***14.21***	***15.25***	***16.38***	***17.42***	***18.37***
Electricity Grid SF6 Losses [4]	***0.51***	***0.49***	***0.44***	***0.42***	***0.40***	***0.37***	***0.33***	***0.29***	***0.30***	***0.27***	***0.24***	***0.25***	***0.24***	***0.18***	***0.14***	***0.42***
Semiconductor Manufacturing [3]	***0.52***	***0.35***	***0.35***	***0.35***	***0.35***	***0.30***	***0.36***	***0.35***	***0.23***	***0.20***	***0.20***	***0.28***	***0.26***	***0.26***	***0.26***	***0.26***
Recycling and Waste	**7.35**	**7.51**	**7.46**	**7.60**	**7.60**	**7.78**	**7.86**	**7.94**	**8.11**	**8.27**	**8.37**	**8.47**	**8.49**	**8.52**	**8.59**	**8.73**
Landfills [3]	***7.22***	***7.36***	***7.31***	***7.43***	***7.42***	***7.59***	***7.65***	***7.71***	***7.88***	***8.02***	***8.11***	***8.19***	***8.20***	***8.22***	***8.28***	***8.40***
Composting	***0.13***	***0.15***	***0.16***	***0.17***	***0.18***	***0.20***	***0.21***	***0.22***	***0.24***	***0.25***	***0.26***	***0.27***	***0.29***	***0.30***	***0.31***	***0.33***
Included Inventory Emissions	***467.19***	***481.69***	***480.98***	***480.94***	***489.13***	***481.75***	***478.70***	***486.16***	***482.78***	***453.34***	***446.06***	***442.38***	***448.97***	***445.08***	***441.85***	***440.36***

[1] Includes equipment used in construction, mining, oil drilling, industrial and airport ground operations.
[2] Reflects emissions from combustion of natural gas, diesel, and lease fuel plus fugitive emissions.
[3] These categories are listed in the Industrial sector of ARB's GHG Emission Inventory sectors.
[4] This category is listed in the Electric Power sector of ARB's GHG Emission Inventory sectors.
[5] The exceptional Aliso Canyon natural gas leak event released 1.96 $MMTCO_2e$ of unanticipated emissions in calendar year 2015 and an additional 0.52 $MMTCO_2e$ 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.