





California Total Energy Demands (Tbtu/Yr)																														02/26/2010						
Difference Between Reference Case and Cap-and-Trade No Offsets 2020																																				
	Asphalt	Aviation Fuel	Biomass	Coal	Coke	Coke Oven Gas	Diesel	Net Electric	Ethanol	Geothermal	Heavy Fuel Oil	Hydro	Hydrogen	Kerosene	Landfill Gases/Waste	Light Fuel Oil	LPG	Lubricants	Motor Gasoline	Naphtha Specialties	Natural Gas	Nuclear	Oil Unspecified	Other Non-Energy Products	Petrochemical Feedstocks	Petroleum Coke	Solar	Steam	Still Gas	Wave	Wind	Unknown 1 (Ethanol)	Unknown 2 (Biodiesel)	Total (Net)		
Single Family	0	0	0	0	0	0	0	92	0	0	0	0	0	0	0	0	0	0	0	0	-39	0	0	0	0	0	0	0	0	0	0	0	0	0	53	
Multi Family	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	-19	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
Other Residential	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	-28	0	0	0	0	0	0	0	0	0	0	0	0	0	-23	
Transportation Services	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Pipelines	0	0	0	0	0	0	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	
Communication	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Utilities	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
Wholesale	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
Retail	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	31	
FIRE	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	18	
Offices - Business Services	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	28	
Education	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	2	0	0	0	0	0	0	0	0	0	0	16	
Health & Social	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
Food, Lodging, Recreation	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	
Government	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	10	
Food & Tobacco	0	0	0	-1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
Textiles	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	0	0	0	-1	
Apparel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lumber	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Furniture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Paper	0	0	0	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Printing	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Chemical	0	0	0	-4	0	0	0	-3	0	0	0	0	0	0	0	0	0	-1	0	-1	7	0	-3	0	0	0	0	0	0	0	0	0	0	0	-5	
Petroleum Products	0	0	0	0	0	0	0	-8	0	0	0	0	0	0	0	0	0	0	0	-15	0	0	0	0	0	-4	0	0	-1	0	0	0	0	0	-28	
Rubber	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
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	
Nonmetallic Minerals	0	0	0	-9	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	
Primary Metals	0	0	0	0	0	0	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	
Fabricated Metals	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Machines	0	0	0	0	0	0	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	1	
Computers	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
Electric Equipment	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Transport Equipment	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Other Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	
Mining Except Oil & Gas	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oil & Gas Extraction	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	-27	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	
Construction	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Forestry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Agriculture	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	0	0	0	0	0	21
Passenger	0	-37	0	0	0	0	-9	6	-8	0	0	0	0	0	0	0	0	0	-298	0	0	0	0	0	0	0	0	0	0	0	177	6	0	0	-165	
Freight	0	0	0	0	0	0	-93	3	0	0	-23	0	0	0	0	0	0	0	-10	0	0	0	0	0	0	0	0	0	0	0	0	5	64	0	-53	
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	
Misc. and Streetlighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Electric Resale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Utility Electric Generation	0	0	8	-34	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	-473	0	0	0	0	0	0	48	0	0	0	38	0	0	-398	
Industry Electric Generation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Steam Generation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Solid Trash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								

-86 Res  
-473 Elec Gen  
9 CHP/Other

Fuel Equivalent																					
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**ESTIMATED CHANGE IN 2020 ENERGY DEMAND AND CRITERIA POLLUTANT EMISSIONS  
BASED ON ENERGY2020 MODELING FOR SELECTED FUELS AND SECTORS**

**CHANGE IN ENERGY DEMAND (Tbtu/YR)**

	Biomass	Coal (ElecGen Only)	Diesel	Ethanol	Motor Gasoline	Natural Gas (Elec Gen)	Natural Gas (Residential)	Natural Gas (CHP/Other)	Petroleum Coke	Still Gas	Unknwn1 Ethanol	Unknwn2 Biodiesel
<b>Change from Reference Case to Complementary Measures</b>												
Tbtu	8	0	-73	-8	-296	-150	-23	118	-1	-2	184	75
<b>Change from Reference Case to Cap-and-Trade With Offsets</b>												
Tbtu	8	-9	-88	-8	-299	-231	-52	74	-3	-6	183	73
<b>Change from Reference Case to Cap-and-Trade No Offsets</b>												
Tbtu	8	-34	-102	-8	-311	-473	-86	9	-4	-1	182	70

**2020 EMISSION FACTOR ESTIMATES (TONS/Tbtu)**

*These Emission Factor Estimates were developed specifically for this analysis and should not be used for general application.*

	Biomass	Coal (ElecGen Only)	Diesel	Ethanol	Motor Gasoline	Natural Gas (Elec Gen)	Natural Gas (Residential)	Natural Gas (CHP/Other)	Petroleum Coke	Still Gas	Unknwn1 Ethanol	Unknwn2 Biodiesel
TOG	7.40	7.46	13.80	33.72	33.72	7.66	5.16	7.66	1.14	8.35	33.72	13.80
ROG	3.24	0.34	11.30	30.51	30.51	1.21	2.18	1.21	0.32	3.57	30.51	11.30
NOx	41.56	20.38	163.06	25.54	25.54	8.85	35.82	8.85	6.73	34.35	25.54	163.06
SOx	4.67	13.91	0.77	0.75	0.75	0.36	0.28	0.36	309.03	13.36	0.75	0.77
CO	155.47	13.21	92.75	317.03	317.03	8.84	18.81	8.84	0.00	22.45	317.03	92.75
PM10	10.21	2.63	7.03	6.95	6.95	1.76	3.58	1.76	9.00	4.81	6.95	7.03
PM2.5	9.39	0.99	4.68	4.44	4.44	1.75	3.58	1.75	7.59	4.73	4.44	4.68

**ESTIMATED CHANGE IN EMISSIONS (TONS/DAY)**

	Biomass	Coal (ElecGen Only)	Diesel	Ethanol	Motor Gasoline	Natural Gas (Elec Gen)	Natural Gas (Residential)	Natural Gas (CHP/Other)	Petroleum Coke	Still Gas	Unknwn1 Ethanol	Unknwn2 Biodiesel	Total
<b>Change from Reference Case to Complementary Measures</b>													
TOG	0.2	0.0	-2.8	-0.7	-27.4	-3.2	-0.3	2.5	0.0	0.0	17.0	2.9	-11.9
ROG	0.1	0.0	-2.3	-0.7	-24.8	-0.5	-0.1	0.4	0.0	0.0	15.3	2.3	-10.2
NOx	0.9	0.0	-32.5	-0.6	-20.7	-3.6	-2.2	2.9	0.0	-0.1	12.9	33.7	-9.5
SOx	0.1	0.0	-0.2	0.0	-0.6	-0.1	0.0	0.1	-0.4	-0.1	0.4	0.2	-0.7
CO	3.5	0.0	-18.5	-7.0	-257.5	-3.6	-1.2	2.9	0.0	-0.1	159.5	19.2	-102.8
PM10	0.2	0.0	-1.4	-0.2	-5.6	-0.7	-0.2	0.6	0.0	0.0	3.5	1.5	-2.4
PM2.5	0.2	0.0	-0.9	-0.1	-3.6	-0.7	-0.2	0.6	0.0	0.0	2.2	1.0	-1.6
<b>Change from Reference Case to Cap-and-Trade With Offsets</b>													
TOG	0.2	-0.2	-3.3	-0.7	-27.7	-4.8	-0.7	1.6	0.0	-0.1	16.9	2.8	-16.2
ROG	0.1	0.0	-2.7	-0.7	-25.0	-0.8	-0.3	0.2	0.0	-0.1	15.3	2.3	-11.7
NOx	0.9	-0.5	-39.3	-0.6	-21.0	-5.6	-5.1	1.8	-0.1	-0.5	12.8	32.5	-24.4
SOx	0.1	-0.3	-0.2	0.0	-0.6	-0.2	0.0	0.1	-2.5	-0.2	0.4	0.2	-3.4
CO	3.5	-0.3	-22.3	-7.0	-260.1	-5.6	-2.7	1.8	0.0	-0.4	159.2	18.5	-115.3
PM10	0.2	-0.1	-1.7	-0.2	-5.7	-1.1	-0.5	0.4	-0.1	-0.1	3.5	1.4	-3.9
PM2.5	0.2	0.0	-1.1	-0.1	-3.6	-1.1	-0.5	0.4	-0.1	-0.1	2.2	0.9	-2.9
<b>Change from Reference Case to Cap-and-Trade No Offsets</b>													
TOG	0.2	-0.7	-3.9	-0.7	-28.7	-9.9	-1.2	0.2	0.0	0.0	16.8	2.7	-25.4
ROG	0.1	0.0	-3.2	-0.7	-26.0	-1.6	-0.5	0.0	0.0	0.0	15.2	2.2	-14.4
NOx	0.9	-1.9	-45.6	-0.6	-21.7	-11.5	-8.4	0.2	-0.1	-0.1	12.7	31.4	-44.6
SOx	0.1	-1.3	-0.2	0.0	-0.6	-0.5	-0.1	0.0	-3.6	0.0	0.4	0.1	-5.7
CO	3.5	-1.2	-25.9	-7.0	-269.8	-11.5	-4.4	0.2	0.0	-0.1	158.1	17.9	-140.2
PM10	0.2	-0.2	-2.0	-0.2	-5.9	-2.3	-0.8	0.0	-0.1	0.0	3.5	1.4	-6.4
PM2.5	0.2	-0.1	-1.3	-0.1	-3.8	-2.3	-0.8	0.0	-0.1	0.0	2.2	0.9	-5.1

Coal estimates are based on coal used for Electricity Generation  
Natural Gas estimates are based on Electricity Generation and Residential Use

### Difference Between Reference Case and Complementary Policies

		SCAQMD MSBACT Guidelines		CALEPA CAT Updated Macroeconomic Report	
Criteria Pollutant	Estimated Change (TPD)	\$/Ton	Value \$1,000/Yr	\$/Ton	Value \$1,000/Yr
Reactive Organic Gases (ROG)	-10.2	\$ 22,297	(\$83,029)	\$ 12,813	(\$47,712)
Oxides of Nitrogen (NOx)	-9.5	\$ 21,083	(\$72,948)	\$ 21,320	(\$73,768)
Oxides of Sulfur (SOx)	-0.7	\$ 11,149	(\$2,715)		
Carbon Monoxide (CO)	-102.8	\$ 442	(\$16,590)		
Particulate Matter (PM10)	-2.4	\$ 4,967	(\$4,402)	\$ 20,500	(\$18,170)
Total	-125.6		(\$179,684)		(\$139,651)

### Difference Between Reference Case and Cap-and-Trade With Offsets

		SCAQMD MSBACT Guidelines		CALEPA CAT Updated Macroeconomic Report	
Criteria Pollutant	Estimated Change (TPD)	\$/Ton	Value \$1,000/Yr	\$/Ton	Value \$1,000/Yr
Reactive Organic Gases (ROG)	-11.7	\$ 22,297	(\$94,956)	\$ 12,813	(\$54,567)
Oxides of Nitrogen (NOx)	-24.4	\$ 21,083	(\$187,893)	\$ 21,320	(\$190,005)
Oxides of Sulfur (SOx)	-3.4	\$ 11,149	(\$14,012)		
Carbon Monoxide (CO)	-115.3	\$ 442	(\$18,605)		
Particulate Matter (PM10)	-3.9	\$ 4,967	(\$7,067)	\$ 20,500	(\$29,166)
Total	-158.7		(\$322,533)		(\$273,738)

### Difference Between Reference Case and Cap-and-Trade No Offsets

		SCAQMD MSBACT Guidelines		CALEPA CAT Updated Macroeconomic Report	
Criteria Pollutant	Estimated Change (TPD)	\$/Ton	Value \$1,000/Yr	\$/Ton	Value \$1,000/Yr
Reactive Organic Gases (ROG)	-14.4	\$ 22,297	(\$117,433)	\$ 12,813	(\$67,483)
Oxides of Nitrogen (NOx)	-44.6	\$ 21,083	(\$343,025)	\$ 21,320	(\$346,881)
Oxides of Sulfur (SOx)	-5.7	\$ 11,149	(\$23,325)		
Carbon Monoxide (CO)	-140.2	\$ 442	(\$22,625)		
Particulate Matter (PM10)	-6.4	\$ 4,967	(\$11,655)	\$ 20,500	(\$48,103)
Total	-211.4		(\$518,063)		(\$462,467)