

Appendix F

Energy Calculations

**Royal Vista
Construction Energy Analysis**

Annual Fuel Summary

Maximum Heavy-Duty Construction Equipment	
626,259	Total Project Consumption
192,898	Annual Consumption
On-Road Diesel	
36,668	Total Project Consumption
11,294	Annual Consumption
On-Road Gasoline	
36,408	Total Project Consumption
11,214	Annual Consumption
662,927	Total Gallons Diesel
36,408	Total Gallons Gasoline
204,193	Average Annual Gallons Diesel
11,214	Average Annual Gallons Gasoline

3.2 Estimated Project Construction Duration (years)

Los Angeles County			Percent of Annual Project Compared to Los Angeles County
Source	Fuel Type	Gallons	
Workers	Gasoline	3,061,000,000	0.0012%
Off-Road/Vendor/Haul Trucks	Diesel	474,576,271	0.140%

Notes:

1 Gasoline and diesel amounts from CEC, 2019. Available: <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting>

Annual Electricity Summary

Temporary Construction Trailer - Electricity	17,820 kWh/year
Electricity Demand from Water Conveyance	26,286 kWh/year
Total	44,106 kWh/year
Total SCE Sales - 2021	8,421,800,000 kWh/year
Construction Increase	0.001%

Source: Southern California Edison 2022 Annual Report. <https://s3.amazonaws.com/cms.ipressroom.com/406/files/20232/2022-eix-sce-annual-report.pdf>

**Royal Vista
Construction Energy Analysis**

Off-Road Equipment

Equipment ≤ 100 hp

pounds diesel fuel/hp-hr (lb/hp-hr): ¹	0.408 lb/hp-hr
diesel density (lb/gal): ¹	7.11 lb/gal
diesel gallons/hp-hr:	0.0574 gal/hp-hr
Total <100	1,688,563 hp-hr
Total diesel gallons:	96,911 gal

Equipment > 100 hp

pounds diesel fuel/hp-hr (lb/hp-hr): ¹	0.367 lb/hp-hr
diesel density (lb/gal): ¹	7.11 lb/gal
diesel gallons/hp-hr:	0.0516 gal/hp-hr
Total >100	10,253,629 hp-hr
Total diesel gallons:	529,348 gal

Total diesel gallons (off-road equipment): 626,259 gal

[1. OFFROAD2017 Emission Factor Documentation](#)

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Demolition	Concrete/Industrial Saws	1	8	33	0.73	43	8,287
Demolition	Excavators	1	8	36	0.38	43	4,706
Site Preparation	Tractors/Loaders/Backhoes	2	8	84	0.37	62	30,831
Grading/Excavation	Excavators	1	8	36	0.38	314	34,364
Grading/Excavation	Graders	1	8	148	0.41	314	152,428
Grading/Excavation	Rubber Tired Dozers	1	8	367	0.4	314	368,762
Grading/Excavation	Scrapers	6	8	423	0.48	314	3,060,219
Grading/Excavation	Tractors/Loaders/Backhoes	2	8	84	0.37	314	156,146
Building Construction	Cranes	1	7	367	0.29	392	292,044
Building Construction	Forklifts	3	8	82	0.2	392	154,291
Building Construction	Generator Sets	1	8	14	0.74	392	32,489
Building Construction	Tractors/Loaders/Backhoes	3	7	84	0.37	392	255,851
Building Construction	Welders	1	8	46	0.45	392	64,915
Paving	Pavers	2	8	81	0.42	104	56,609
Paving	Paving Equipment	2	8	89	0.36	104	53,315
Paving	Rollers	2	8	36	0.38	104	22,764
Architectural Coating	Air Compressors	1	6	37	0.48	236	25,148
Foundations/Concrete Pour	Excavators	2	8	36	0.38	260	56,909
Foundations/Concrete Pour	Graders	1	8	148	0.41	260	126,214
Foundations/Concrete Pour	Rubber Tired Dozers	1	8	367	0.4	260	305,344
Foundations/Concrete Pour	Scrapers	2	8	423	0.48	260	844,646
Foundations/Concrete Pour	Tractors/Loaders/Backhoes	2	8	84	0.37	260	129,293
Demolition	Tractors/Loaders/Backhoes	2	8	84	0.37	43	21,383
Demolition	Crawler Tractors	2	8	87	0.43	43	25,738
Demolition	Generator Sets	1	8	14	0.74	43	3,564
Site Preparation	Crawler Tractors	2	8	87	0.43	62	37,111
Site Preparation	Excavators	1	8	36	0.38	62	6,785
Grading/Excavation	Crawler Tractors	4	8	87	0.43	314	375,896
Grading/Excavation	Pumps	1	8	11	0.74	314	20,448
Grading/Excavation	Bore/Drill Rigs	4	8	221	0.5	314	1,110,304
Drainage/Utilities/Trenching	Excavators	2	8	36	0.38	156	34,145
Drainage/Utilities/Trenching	Graders	1	8	148	0.41	156	75,729
Drainage/Utilities/Trenching	Rubber Tired Dozers	1	8	367	0.4	156	183,206
Drainage/Utilities/Trenching	Scrapers	2	8	423	0.48	156	506,788
Drainage/Utilities/Trenching	Tractors/Loaders/Backhoes	2	8	84	0.37	156	77,576
Grading/Excavation	Off-Highway Trucks	8	8	376	0.38	314	2,871,316
Drainage/Utilities/Trenching	Off-Highway Trucks	2	8	376	0.38	156	356,628
						Total >100	10,253,629
						Total <100	1,688,563

Royal Vista
Construction Energy Analysis

Temporary Construction Trailer - Electricity			
Land Use	Square Feet	Energy Use per year (kWh)	Total Energy Use (kWh)
General Office	1,000	17,820	57,853.973

Note: CalEEMod 2022 used to estimate energy use for temporary construction office. EDFZ Zone 7.

**Royal Vista
Construction Energy**

Construction Water Energy Estimates

Source	Acreage/Day	Number of Days	Total Construction Water Use (Mgal)	Electricity Demand from Water Conveyance (MWh)	Annual Electricity Demand from Water Conveyance (MWh)
Demolition	1.0	43	0.129	0.9	0.3
Site Preparation	1.0	62	0.186	1.3	0.4
Grading/Excavation	9.0	314	8.478	57.7	17.8
Drainage/Utilities/Trenching	3.0	156	1.404	9.6	2.9
Foundations/Concrete Pour	3.0	260	2.340	15.9	4.9
Total			12.537	85.3	26.3

CalEEMod Water Electricity Factors	Electricity Intensity Factor To Supply (kWh/Mgal)	Electricity Intensity Factor To Treat (kWh/Mgal)	Electricity Intensity Factor To Distribute (kWh/Mgal)	Electricity Intensity Factor For Wastewater Treatment (kWh/Mgal)
	3044	725	1537	1501

Construction Water GHG	Electricity Emission (MT CO2e/MWh)	Electricity Emission (lbs CO2e/MWh)
16.07	0.19	415.12

Sources and Assumptions:

CalEEMod Appendix A, Pg. 8, based on given piece of equipment can pass over in an 8-hour workday

-Electricity Intensity Factors - California Emissions Estimator Model (CalEEMod).

-Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of

landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%.

Factor is therefore $(20.94 \text{ GAL/SF/year}) \times (43,560 \text{ SF/acre}) / (365 \text{ days/year}) / (0.85) = 2,940 \text{ gallons/acre/day}$, rounded up to 3,000 gallons/acre/day.

(U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. "Guidelines for Estimating Unmetered Landscaping Water Use."

July 2010. Page 12, Table 4 - Annual Irrigation Factor – Landscaped Areas with High Water Requirements).

Retail Gasoline Sales by County

County	2012 ^a Survey		2012 ^a Estimated		2013 ^a Survey		2013 ^a Estimated		2014 ^a Survey		2014 ^a Estimated		2015 ^a Survey		2015 ^a Estimated		2016 ^a Survey		2016 ^a Estimated		2017 ^a Survey		2017 ^a Estimated		2018 ^a Survey		2018 ^a Estimated		2019 ^a Survey		2019 ^a Estimated		2020 ^a Survey		2020 ^a Estimated		2021 ^a Survey		2021 ^a Estimated	
	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)	Responses (Millions of Gallons)	Totals (Millions of Gallons)		
Alameda	480	568	473	603	341	491	432	542	518	582	521	583	495	569	505	591	400	442	393	492																				
Amador	12	14	10	12	11	15	10	13	12	14	13	15	14	17	16	18	12	13	11	14																				
Butte	66	78	64	81	59	85	62	78	74	83	78	87	75	86	62	78	58	68	58	74																				
Calaveras	10	12	10	13	10	14	11	14	13	15	14	15	13	15	14	15	11	13	11	13																				
Colusa	8	10	10	13	10	13	7	9	10	11	11	12	11	13	11	13	12	15	11	16																				
Contra Costa	354	419	331	422	272	392	303	380	384	431	385	430	346	397	374	427	304	336	304	374																				
Del Norte	6	7	4	5	5	7	5	6	6	7	6	7	4	5	4	6	5	4	5	4																				
El Dorado	64	75	56	72	36	52	65	81	72	81	73	82	66	76	64	74	58	62	54	65																				
Fresno	288	341	269	344	209	300	264	331	318	358	328	367	320	368	306	376	296	347	292	387																				
Glenn	11	12	11	14	11	16	13	16	15	17	17	18	15	17	14	18	13	15	14	17																				
Humboldt	45	53	51	64	31	44	45	59	54	61	49	55	51	58	42	53	51	56	47	52																				
Imperial	46	54	46	58	58	83	63	79	77	86	74	83	78	89	73	86	59	64	56	74																				
Inyo	13	16	12	16	12	17	14	18	16	18	16	18	16	18	14	17	14	16	14	15																				
Kern	301	356	287	367	267	384	299	375	362	407	349	390	345	396	340	392	318	364	331	406																				
Kings	40	47	38	49	31	45	41	51	50	57	54	60	52	60	47	56	49	52	42	58																				
Lake	17	20	19	24	17	25	19	23	19	21	19	21	20	23	18	24	17	20	17	20																				
Lassen	5	6	5	6	6	8	7	9	8	9	8	9	7	8	5	6	6	7	7	7																				
Los Angeles	2,916	3,451	2,700	3,445	2,606	3,749	2,762	3,465	3,184	3,577	3,272	3,659	3,169	3,638	3,189	3,559	2,513	2,770	2,700	3,061																				
Madera	44	53	43	54	31	45	35	44	52	59	56	62	49	57	44	53	45	63	53	71																				
Marin	91	107	83	106	52	75	83	105	91	102	90	101	71	82	86	96	72	77	66	88																				
Mariposa	5	6	4	5	6	9	5	6	7	8	6	7	6	7	5	6	4	5	6	7																				
Mendocino	36	43	33	42	28	40	32	42	34	42	34	42	35	40	27	44	35	37	33	39																				
Merced	78	92	74	94	58	83	84	105	101	114	105	117	115	132	100	119	91	106	90	122																				
Mono	2	2	6	8	6	8	6	7	6	7	5	6	6	7	7	8	6	5	6	6																				
Monterey	124	147	139	177	87	126	147	184	157	177	155	174	157	181	148	174	123	141	116	162																				
Napa	49	58	41	52	27	39	50	63	50	57	47	53	53	61	54	57	40	44	42	47																				
Nevada	29	34	19	25	19	27	31	40	36	40	35	39	33	38	29	39	31	36	28	35																				
Orange	1,145	1,355	1,044	1,332	1,018	1,465	1,092	1,370	1,224	1,382	1,236	1,382	1,222	1,402	1,198	1,375	943	1,029	1,037	1,159																				
Placer	162	192	131	167	118	170	167	209	181	204	182	203	179	206	177	198	150	163	160	178																				
Plumas	6	7	3	4	5	8	5	7	5	5	5	6	5	6	5	6	5	6	4	7																				
Riverside	756	895	725	925	702	1,010	828	1,039	921	1,035	941	1,052	916	1,052	921	999	876	847	799	981																				
Sacramento	473	560	446	568	308	442	465	584	534	600	535	599	511	586	600	646	475	689	448	557																				
San Benito	17	20	5	7	10	14	12	15	15	17	18	20	15	17	12	21	10	18	11	17																				
San Bernardino	742	878	697	889	659	948	725	909	899	1,010	888	993	862	990	851	977	757	823	786	926																				
San Diego	1,079	1,277	972	1,241	1,352	1,123	1,408	1,221	1,372	1,231	1,377	1,208	1,387	1,197	1,325	973	1,055	964	1,165																					
San Francisco	126	149	126	161	71	102	107	134	119	134	120	134	105	120	107	118	76	91	82	99																				
San Joaquin	253	299	254	325	217	312	287	360	303	340	310	347	293	336	289	352	255	292	265	321																				
San Luis Obispo	105	124	109	140	101	145	117	147	127	142	127	142	131	150	125	138	103	115	101	125																				
San Mateo	258	306	244	311	159	229	243	304	289	325	291	326	264	304	229	322	215	238	217	269																				
Santa Barbara	140	166	135	172	124	178	148	186	161	181	152	170	167	191	166	177	136	146	148	168																				
Santa Clara	589	697	546	696	460	661	580	727	638	717	613	643	560	643	614	713	446	511	488	599																				
Santa Cruz	89	105	79	101	53	77	77	96	85	95	84	94	78	90	72	90	69	74	64	88																				
Shasta	77	91	65	83	55	79	76	95	76	92	83	92	76	87	72	82	68	76	67	79																				
Siskiyou	19	23	9	12	10	14	7	27	24	27	26	29	25	28	26	27	22	25	19	28																				
Solano	180	213	158	202	116	167	160	201	167	210	194	217	188	216	182	216	155	180	161	196																				
Sonoma	160	189	163	208	146	210	160	201	186	209	167	208	167	192	169	204	146	167	159	181																				
Stanislaus	173	205	144	183	159	229	201	252	217	244	227	253	212	244	196	245	178	197	205	243																				
Sutter	34	40	33	42	17	24	30	38	35	39	35	39	35	39	27	38	30	34	30	34																				
Tehama	23	27	19	24	18	26	24	30	25	29	26	29	27	31	28	30	25	26	25	30																				
Trinity	1	2	3	4	3	4	3	4	4	5	4	5	4	4	2	4	3	4	3	4																				
Tulare	120	142	91	116	107	155	114	143	136	152	149	167	147	168	144	174	126	149	138	181																				
Tuolumne	15	18	12	15	14	21	18	23	21	23	21	23	22	25	21	23	19	20	17	19																				
Ventura	262	310	246	314	249	358	256	321	294	330	302	338	298	342	297	329	242	262	255	294																				
Yolo	74	87	75	96	63	90	82	103	98	110	101	110	96	110	91	114	76	91	83	101																				
Yuba	22	26	23	30	14	20	24	30	32	36	30	34	40	46	27	32	26	35	28	40																				
Other Counties	1	2	1	1	1	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2																				
Total	12,241	14,486	11,396	14,540	10,220	14,701	12,044	15,108	13,785	15,491	13,936	15,584	13,475	15,471	13,473	15,365	11,174	12,572	11,618	13,818																				

^a2012 to 2019 data are not directly comparable to other years since an improved methodology is used, but is within 5 percent compared to the previous methodology.

Other Counties include Alpine, Modoc and Sierra.

Retail Diesel Sales by County

(Millions of Gallons)

County	2012 ^a Survey Responses (Millions of Gallons)	2012 ^a Estimated Totals (Millions of Gallons)	2013 ^a Survey Responses (Millions of Gallons)	2013 ^a Estimated Totals (Millions of Gallons)	2014 ^a Survey Responses (Millions of Gallons)	2014 ^a Estimated Totals (Millions of Gallons)	2015 ^a Survey Responses (Millions of Gallons)	2015 ^a Estimated Totals (Millions of Gallons)	2016 ^a Survey Responses (Millions of Gallons)	2016 ^a Estimated Totals (Millions of Gallons)	2017 ^a Survey Responses (Millions of Gallons)	2017 ^a Estimated Totals (Millions of Gallons)	2018 ^a Survey Responses (Millions of Gallons)	2018 ^a Estimated Totals (Millions of Gallons)	2019 ^a Survey Responses (Millions of Gallons)	2019 ^a Estimated Totals (Millions of Gallons)	2020 ^a Survey Responses (Millions of Gallons)	2020 ^a Estimated Totals (Millions of Gallons)	2021 ^a Survey Responses (Millions of Gallons)	2021 ^a Estimated Totals (Millions of Gallons)
Alameda	30	36	27	34	19	27	38	49	47	54	51	58	56	62	48	55	47	51	50	53
Amador	2	2	1	2	1	2	1	2	2	2	2	2	2	3	3	3	2	2	2	3
Butte	7	9	8	10	8	10	9	11	11	13	11	13	12	13	12	15	10	11	11	13
Calaveras	2	2	1	2	1	2	1	2	3	3	3	3	2	3	3	3	3	3	2	3
Colusa	4	5	4	5	2	2	3	4	4	4	2	3	4	4	7	7	10	11	8	11
Contra Costa	17	20	17	21	12	17	19	24	23	26	24	28	31	34	24	27	22	23	22	28
Del Norte	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	1	2	1	1
El Dorado	6	7	5	6	4	6	7	9	8	9	8	9	8	8	8	10	8	8	8	11
Fresno	33	40	23	29	18	25	39	50	40	46	40	45	46	51	39	49	62	66	52	91
Glenn	4	5	4	5	4	5	5	6	12	14	16	19	16	17	18	19	17	18	16	17
Humboldt	10	12	11	14	4	5	10	13	13	14	8	9	7	8	6	7	6	6	9	10
Imperial	7	8	8	10	8	11	9	11	14	16	11	12	20	22	21	25	22	24	27	27
Inyo	2	2	3	4	3	3	3	4	3	4	3	4	3	3	3	4	3	4	3	3
Kern	133	158	118	148	124	171	125	160	131	149	107	121	97	108	96	105	108	116	116	137
Kings	7	9	5	6	4	6	7	9	5	6	7	7	8	9	8	9	7	7	6	10
Lake	2	2	2	3	2	3	3	3	1	1	3	3	3	4	3	4	3	4	3	4
Lassen	1	1	1	1	1	2	3	3	4	4	1	1	1	1	1	2	1	1	2	2
Los Angeles	205	245	190	239	194	267	257	328	273	309	267	301	228	253	246	276	279	299	206	224
Madera	24	28	18	23	22	31	26	33	28	31	29	33	28	31	23	24	30	32	36	37
Marin	3	3	2	3	2	2	2	3	4	4	4	4	3	3	4	4	4	4	4	5
Mariposa	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	2
Mendocino	7	9	6	6	4	5	6	7	9	10	6	6	5	6	5	8	9	9	6	10
Merced	46	55	49	62	49	68	54	69	59	66	38	42	35	39	28	36	28	30	28	33
Mono	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Monterey	25	30	22	27	13	18	23	29	24	28	24	27	24	26	23	26	21	22	20	27
Napa	6	7	2	3	2	3	6	8	6	7	6	7	6	7	6	7	6	6	6	6
Nevada	4	4	1	2	4	6	7	8	8	9	8	9	7	8	5	8	7	8	6	8
Orange	38	46	33	42	37	51	46	59	52	59	54	61	49	55	51	56	49	53	43	46
Placer	12	15	9	12	10	13	13	16	15	17	15	17	16	17	16	17	32	35	18	20
Plumas	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2
Riverside	89	107	86	109	100	138	119	152	128	145	131	148	119	132	108	122	134	144	138	146
Sacramento	27	32	18	21	21	29	28	36	38	42	42	48	41	45	37	41	41	44	40	45
San Bernardino	158	189	164	206	152	210	198	253	223	252	235	265	176	195	165	178	148	159	184	198
San Diego	62	74	58	73	67	93	87	111	93	105	92	103	92	103	94	110	88	94	93	117
San Francisco	3	4	4	5	1	2	5	6	6	6	5	6	5	5	5	5	4	4	4	5
San Joaquin	84	99	90	113	86	119	102	131	116	131	111	126	105	117	101	113	86	93	94	97
San Luis Obispo	11	13	9	12	12	17	19	24	20	23	19	21	20	22	20	22	19	20	17	22
San Mateo	8	10	8	10	4	6	15	19	13	14	15	17	16	17	18	19	12	13	13	16
Santa Barbara	10	13	12	15	13	18	20	26	22	25	17	19	21	24	18	19	16	17	16	17
Santa Clara	27	32	28	35	25	35	36	47	30	34	32	36	43	48	33	42	32	35	31	50
Santa Cruz	4	5	4	6	2	3	5	6	5	6	6	6	6	7	4	6	7	8	6	7
Shasta	16	19	18	22	13	18	21	27	21	24	22	25	21	24	14	16	13	14	20	22
Siskiyou	16	20	15	19	16	20	20	26	19	22	18	21	16	17	16	17	17	18	16	18
Solano	14	16	14	17	8	11	14	18	17	19	22	24	23	25	24	27	25	27	19	30
Sonoma	13	16	14	17	12	17	20	23	15	20	20	23	20	22	20	28	28	30	26	30
Stanislaus	25	30	15	19	20	27	26	33	20	22	30	34	32	36	33	35	36	39	44	49
Sutter	3	4	4	5	2	3	4	5	5	6	3	4	4	5	5	6	5	5	4	4
Tehama	35	42	37	47	25	35	37	48	35	39	34	38	18	20	17	18	7	8	14	17
Tulare	27	32	31	39	31	43	34	43	37	42	37	41	31	34	34	42	45	47	51	66
Tuolumne	1	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	4
Ventura	23	27	23	29	25	34	27	34	29	32	32	36	30	33	33	35	29	32	31	35
Yolo	27	33	30	37	29	40	27	35	32	37	27	30	25	28	24	26	21	22	24	28
Yuba	3	4	3	4	2	3	2	3	4	5	8	9	11	12	4	5	4	4	4	12
Other Counties*	1	2	1	1	1	2	2	2	3	3	3	3	2	2	2	3	2	2	2	3
Total	1,327	1,589	1,261	1,587	1,226	1,691	1,592	2,033	1,742	1,971	1,717	1,937	1,602	1,777	1,559	1,756	1,624	1,744	1,611	1,883

^a 2012-2019 data are not directly comparable to other years since an improved methodology is used, but is within 5 percent compared to the previous methodology.

* Other Counties include Alpine, Modoc, San Benito, Sierra and Trinity.

Note: Non-Retail diesel sales, which comprise approximately 52.8% of all diesel sales, are not reported in this chart.

This tool provides a quick estimation of the fuel use and emissions for your equipment in a specific year. The results may slightly differ from those from the official inventory model.

Instructions:

Enter the horsepower, model year, and other details about your equipment in the input box.

Make sure to update the **load factor** for your equipment using the lookup table.

The **Output** box gives a quick estimation of the fuel use, NOx, PM, and THC emission for your equipment.

Input	Input Engine Here
Horsepower (hp)	100
Model year	2011
Calendar year	2015
Activity (annual hours)	250
Accumulated hours on equipment (estimate using annual-hours * age if you only know the age of the equipment)	1000
Load factor (check the lookup table)	0.2

Results	
Fuel Used (gallon)	287
NOx Emissions (kg)	12.9
PM Emissions (kg)	0.6
THC Emissions (kg)	0.6
CO2 Emissions (kg)	2929.9
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.57
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.12
THC Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.11

Intermediate steps	
HPbin	175
NOx_EFO	2.67
NOx_DR	3.5E-05
NOx_FCF	0.950
PM_EFO	0.12
PM_DR	8.6E-06
PM_FCF	0.90
THC_EFO	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.57
PM_EF (g/hp-hr)	0.12
THC_EF (g/hp-hr)	0.11
CO2_EF (kg/gallon-diesel)*	10.21
B5FC (lb/hp-hr)	0.408
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Loac Factor Lookup Table			
Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
Others		0.40	
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
Yard tractor		0.39	
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46	
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
Other GSE		0.34	
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
Other General Industrial Equipment		0.34	
Other Material Handling Equipment		0.40	
Sweepers/Scrubbers		0.46	
Drill Rig (Mobile)		0.50	
Oil and Drill Rigs	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

Royal Vista
Operational Energy Demand

Electricity	kWh/yr	MWh/yr
Existing		
Golf Course	0	-
Existing Building Energy Subtotal	0	0
Existing Subtotal (including water, see below)	698,901	699
Project		
Single-Family Housing	1,571,590	1,572
Condo/Townhouse	775,570	776
City Park	0	-
Project Total Building Energy	2,347,160	2,347
Project Total	2,347,160	2,347.16
Total (including water, see below)	2,592,321	2,592

Source: California Air Resources Board, CalEEMod, Version 2022.1

Electricity	MWh/yr (Sales)
Total SCE, 2021	84,218,000
Existing Annual	699
Project Annual	2,592
Net Project Annual	1,893
Percent Net Project of SCE	0.0022%

1,893.42

Source: Southern California Edison 2022 Annual Report.
<https://s3.amazonaws.com/cms.ipressroom.com/406/files/20232/2022-eix-sce-annual-report.pdf>

Water	Mgal/yr	MWh/yr
Existing		
Golf Course	102.67	698.90
Existing Total	102.67	698.90
Project		
Single-Family Housing	30.06	204.59
Condo/Townhouse	5.96	40.57
City Park	0.00	-
Project Total	36.016	245.16
Electricity Intensity Factors		
	kWh/Mgal	
Electricity Factor - Supply	3,044	
Electricity Factor - Treat	725	
Electricity Factor - Distribute	1,537	
Electricity Factor - Wastewater Treatment	1,501	

Source: California Air Resources Board, CalEEMod, Version 2022.1

Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

0.22

0.39

Natural Gas	kBtu/yr	cubic foot (cf)
Existing		
Golf Course	0	-
Project		
Single-Family Housing	0	-
Condo/Townhouse	0	-
City Park	0	-
Net Total	-	-

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Conversion factor of 1,035 Btu per cubic foot based on United States Energy Information Administration data

(see: USEIA, Natural Gas, Heat Content of Natural Gas Consumed, February 28, 2018,

https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPGO_VGTH_btucf_a.htm. Accessed March 2020.)

Natural Gas	2021 Residential Supply Taken (MMcf/yr)	2021 Residential Supply taken (MMcf/yr)
SoCalGas	224,000	224,000
Existing Annual	-	-
Project Annual	-	-
Net Project Annual	-	-
Percent Net Project of SoCalGas	0.0000%	0.0000%

Source: California Gas and Electric Utilities, 2022 California Gas Report:
https://www.socalgas.com/sites/default/files/Joint_Utility_Biennial_Comprehensive_California_Gas_Report_2022.pdf
Report, p. 145,2020.

**Royal Vista
Project Energy Analysis
Fuel Usage from VMT**

Annual VMT (Traffic Study)⁴: 7,578,731 miles/year

Fuel Type: ¹	Gasoline	Diesel	Electricity	Natural Gas	Plug-in Hybrid
Percent:	89.9%	3.5%	4.3%	0.2%	2.1%
Miles per Gallon Fuel:	26.5	9.0	-	4.4	60.6
Annual VMT by Fuel Type (miles):	6,814,215	266,072	324,270	13,905	160,268
Annual Fuel Usage (gallons):	257,420	29,614	-	408,759	2,643

Los Angeles County Fuel Consumption ³		
	Gasoline	Diesel
Los Angeles County:	3,061,000,000	474,576,271
Mobile	260,063	29,614
Project Total	260,063	29,614
Existing Total	141,409	12,852
Net Project Total	118,654	16,762
Percent Net Project of Los Angeles County:	0.004%	0.004%

Notes:

1. California Air Resources Board, EMFAC2021 (LA County; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
- 3.

California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2019. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/pia_ra_retail_survey.html. Accessed May 2021. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales.

4. Source: California Air Resources Board, CalEEMod, Version 2020.

Royal Vista
Existing Energy Analysis
Fuel Usage from VMT

Annual VMT (Traffic Study)⁴: 3,449,198 miles/year

Fuel Type: ¹	Gasoline	Diesel	Electricity	Natural Gas	Plug-in Hybrid
Percent:	94.1%	3.0%	1.6%	0.2%	1.1%
Miles per Gallon Fuel:	23.1	8.0	-	4.0	51.7
Annual VMT by Fuel Type (miles):	3,247,022	103,459	54,156	5,547	39,015
Annual Fuel Usage (gallons):	140,654	12,852	-	201,995	755

	Los Angeles County Fuel Consumption ³	
	Gasoline	Diesel
Los Angeles County:	3,061,000,000	474,576,271
Total (PA1, PA2, and PA3)	141,409	12,852
Percent Net Project of Los Angeles County:	0.005%	0.003%

Notes:

1. California Air Resources Board, EMFAC2021 (LA County; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
3. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2019. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed May 2021. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales.
4. Source: California Air Resources Board, CalEEMod, Version 2020.

Retail Gasoline Sales by County

County	2010		2011		2012 ^a		2013 ^a		2014 ^a		2015 ^a		2016 ^a		2017 ^a		2018 ^a		2019 ^a		2020 ^a		2021 ^a	
	2012 ^a Survey Responses (Millions of Gallons)	2011 ^a Estimated Totals (Millions of Gallons)	2013 ^a Survey Responses (Millions of Gallons)	2013 ^a Estimated Totals (Millions of Gallons)	2014 ^a Survey Responses (Millions of Gallons)	2014 ^a Estimated Totals (Millions of Gallons)	2015 ^a Survey Responses (Millions of Gallons)	2015 ^a Estimated Totals (Millions of Gallons)	2016 ^a Survey Responses (Millions of Gallons)	2016 ^a Estimated Totals (Millions of Gallons)	2017 ^a Survey Responses (Millions of Gallons)	2017 ^a Estimated Totals (Millions of Gallons)	2018 ^a Survey Responses (Millions of Gallons)	2018 ^a Estimated Totals (Millions of Gallons)	2019 ^a Survey Responses (Millions of Gallons)	2019 ^a Estimated Totals (Millions of Gallons)	2020 ^a Survey Responses (Millions of Gallons)	2020 ^a Estimated Totals (Millions of Gallons)	2021 ^a Survey Responses (Millions of Gallons)	2021 ^a Estimated Totals (Millions of Gallons)	2022 ^a Survey Responses (Millions of Gallons)	2022 ^a Estimated Totals (Millions of Gallons)	2023 ^a Survey Responses (Millions of Gallons)	2023 ^a Estimated Totals (Millions of Gallons)
Alameda	480	568	473	603	341	491	432	542	518	582	521	583	495	569	505	591	400	442	393	492				
Alameda	12	14	10	12	11	15	10	13	12	14	13	15	14	17	16	18	12	13	11	14				
Butte	66	78	64	81	59	85	62	78	74	83	78	87	75	86	62	78	58	68	58	74				
Calaveras	10	12	10	13	10	14	11	14	13	15	14	15	13	15	14	15	11	15	11	13				
Colusa	8	10	10	13	7	10	7	9	10	11	11	12	11	13	11	13	12	15	12	15				
Contra Costa	354	419	331	422	272	392	303	380	384	431	385	430	346	397	374	427	304	336	304	374				
Del Norte	6	7	4	5	5	7	5	6	6	7	6	7	6	7	4	6	5	5	4	5				
El Dorado	64	75	56	72	36	52	65	81	72	81	73	82	66	76	64	74	58	62	52	65				
Fresno	288	341	269	344	209	300	264	331	318	358	328	367	320	368	306	376	296	347	293	387				
Glenn	11	12	11	14	11	16	13	16	15	17	17	18	15	17	14	18	13	15	14	17				
Humboldt	45	53	51	64	31	44	47	59	54	61	49	55	49	51	42	47	51	56	47	52				
Imperial	46	54	46	58	58	83	63	79	77	86	74	83	78	89	73	86	59	64	56	74				
Inyo	13	16	12	17	12	17	14	18	16	18	16	18	16	18	14	17	14	16	14	15				
Kern	301	356	287	367	267	384	299	375	362	407	349	390	345	396	340	392	318	364	331	406				
Kings	40	47	38	49	31	45	41	51	50	57	54	60	52	60	67	76	49	52	42	58				
Lake	17	20	19	24	17	25	19	23	19	21	19	21	20	23	18	24	17	20	17	20				
Lassen	5	6	5	6	6	8	7	9	8	9	8	9	6	8	5	7	6	6	7	7				
Los Angeles	2,916	3,451	2,700	3,445	2,606	3,749	2,762	3,465	3,184	3,577	3,272	3,659	3,169	3,638	3,189	3,559	2,513	2,770	2,700	3,061				
Madera	44	53	43	54	31	45	35	44	52	59	56	62	49	57	44	62	45	63	53	71				
Marin	91	107	83	106	52	75	83	105	91	102	90	101	71	82	86	96	72	77	66	88				
Mariposa	5	6	4	5	6	9	5	6	7	8	6	7	6	7	4	5	4	5	4	5				
Mendocino	36	43	33	42	28	40	32	40	37	42	34	38	35	40	27	38	32	37	33	39				
Merced	78	92	74	94	58	83	84	105	101	114	105	117	115	132	100	119	91	106	90	122				
Mono	2	2	6	8	6	8	6	7	7	8	5	6	6	7	7	8	5	6	5	6				
Monterey	124	147	139	177	87	126	147	184	157	177	155	174	157	181	148	174	123	141	116	162				
Napa	49	58	41	52	27	39	50	63	50	57	47	53	53	61	54	57	40	44	42	47				
Nevada	29	34	19	25	19	27	31	40	36	40	35	39	33	38	29	39	31	36	28	35				
Placer	1,145	1,355	1,044	1,332	1,018	1,465	1,092	1,370	1,224	1,375	1,236	1,382	1,222	1,402	1,198	1,375	943	1,029	1,037	1,159				
Plumas	162	192	131	167	118	170	167	209	181	204	182	203	179	206	177	198	150	163	160	178				
Plumas	6	7	3	4	5	8	5	7	5	5	5	6	5	6	5	6	5	6	4	7				
Riverside	756	895	725	925	702	1,010	828	1,039	921	1,035	941	1,052	916	1,052	921	1,046	799	876	847	981				
Sacramento	473	560	446	568	308	442	465	584	534	600	535	599	511	586	536	600	475	689	448	557				
San Benito	17	20	5	10	10	14	12	15	15	17	18	20	15	17	12	17	11	18	11	17				
San Bernardino	742	878	697	889	659	948	725	909	888	993	862	990	851	977	757	823	786	823	786	926				
San Diego	1,079	1,277	972	1,241	940	1,352	1,123	1,408	1,221	1,372	1,231	1,377	1,208	1,387	1,197	1,325	973	1,055	964	1,165				
San Francisco	126	149	126	161	71	102	107	134	119	134	120	134	105	120	107	118	76	91	82	99				
San Joaquin	253	299	254	325	217	312	287	360	303	340	310	347	293	336	289	352	255	292	265	321				
San Luis Obispo	105	124	109	140	101	145	117	147	127	142	127	142	131	150	125	138	103	115	101	125				
San Mateo	258	306	244	311	159	229	243	304	289	325	291	326	264	304	292	321	215	238	217	269				
Santa Barbara	140	166	135	172	124	178	148	186	161	181	152	170	167	191	166	177	136	146	148	168				
Santa Clara	589	697	546	696	460	661	580	727	638	717	614	665	560	643	614	713	446	511	488	599				
Santa Cruz	89	105	79	101	53	77	77	96	85	95	84	94	78	90	72	90	69	74	64	88				
Shasta	77	91	65	79	55	79	76	95	76	92	76	92	76	87	72	82	68	76	67	79				
Siskiyou	19	23	9	12	10	14	21	27	24	27	26	29	25	28	26	27	22	25	19	28				
Solano	180	213	158	202	116	167	160	201	187	210	194	216	188	216	182	216	155	180	161	196				
Sonoma	160	189	163	208	146	210	160	201	186	209	186	208	167	192	169	204	146	167	159	181				
Stanislaus	173	205	144	183	159	229	201	252	217	244	227	253	212	244	196	245	178	197	205	243				
Sutter	34	40	33	42	17	24	30	38	35	39	35	39	35	38	40	38	30	30	30	34				
Tehama	23	27	19	24	18	26	24	30	25	29	26	29	27	31	28	30	25	26	25	30				
Trinity	1	2	3	4	3	4	3	4	3	4	3	4	3	4	2	4	3	4	3	4				
Tulare	120	142	91	116	107	155	114	143	136	152	149	167	147	168	144	174	126	149	138	181				
Tuolumne	15	18	12	15	21	25	18	23	21	23	22	25	21	23	21	23	19	20	17	19				
Ventura	262	310	246	314	249	358	256	321	294	330	302	338	298	342	297	329	242	262	255	294				
Yolo	74	87	75	96	63	90	82	103	98	110	101	113	96	110	97	114	76	91	83	101				
Yuba	22	26	23	30	14	20	24	30	32	36	30	34	40	46	27	32	26	35	28	40				
Other Counties ^a	1	2	1	1	1	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2				
Total	12,241	14,486	11,396	14,540	10,220	14,701	12,044	15,108	13,785	15,491	13,936	15,584	13,475	15,471	13,473	15,365	11,174	12,572	11,618	13,818				

^a 2012 to 2021 data are not directly comparable to other years since an improved methodology is used, but is within 5 percent compared to the previous methodology.

^a Other Counties include Alpine, Modoc and Sierra.

Source: California Energy Commission, California Annual Retail Fuel Outlet Report Results (CEC-A15), 2010-2021 <https://www.energy.ca.gov/media/3874>

Retail Diesel Sales by County

(Millions of Gallons)

County	2012 ^a Survey Responses (Millions of Gallons)	2012 ^a Estimated Totals (Millions of Gallons)	2013 ^a Survey Responses (Millions of Gallons)	2013 ^a Estimated Totals (Millions of Gallons)	2014 ^a Survey Responses (Millions of Gallons)	2014 ^a Estimated Totals (Millions of Gallons)	2015 ^a Survey Responses (Millions of Gallons)	2015 ^a Estimated Totals (Millions of Gallons)	2016 ^a Survey Responses (Millions of Gallons)	2016 ^a Estimated Totals (Millions of Gallons)	2017 ^a Survey Responses (Millions of Gallons)	2017 ^a Estimated Totals (Millions of Gallons)	2018 ^a Survey Responses (Millions of Gallons)	2018 ^a Estimated Totals (Millions of Gallons)	2019 ^a Survey Responses (Millions of Gallons)	2019 ^a Estimated Totals (Millions of Gallons)	2020 ^a Survey Responses (Millions of Gallons)	2020 ^a Estimated Totals (Millions of Gallons)	2021 ^a Survey Responses (Millions of Gallons)	2021 ^a Estimated Totals (Millions of Gallons)
Alameda	30	36	27	34	19	27	38	49	47	54	51	58	56	62	48	55	47	51	50	53
Amador	2	2	1	2	1	2	1	2	2	2	2	2	2	3	3	3	2	2	2	3
Butte	7	9	8	10	8	10	9	11	11	13	11	13	12	13	12	15	10	11	11	13
Calaveras	2	2	1	2	1	2	1	2	3	3	3	3	2	3	3	3	3	3	2	3
Colusa	4	5	4	5	2	2	3	4	4	4	2	3	4	4	7	7	10	11	8	11
Contra Costa	17	20	17	21	12	17	19	24	23	26	24	28	31	34	24	27	22	23	22	28
Del Norte	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	1	2	1	1
El Dorado	6	7	5	6	4	6	7	9	8	9	8	9	8	8	8	10	8	8	8	11
Fresno	33	40	23	29	18	25	39	50	40	46	40	45	46	51	39	49	62	66	52	91
Glenn	4	5	4	5	4	5	5	6	12	14	16	19	16	17	18	19	17	18	16	17
Humboldt	10	12	11	14	4	5	10	13	13	14	8	9	7	8	6	7	6	6	9	10
Imperial	7	8	8	10	8	11	9	11	14	16	11	12	20	22	21	25	22	24	27	27
Inyo	2	2	3	4	3	3	3	4	3	4	3	4	3	3	3	4	3	4	3	3
Kern	133	158	118	148	124	171	125	160	131	149	107	121	97	108	96	105	108	116	116	137
Kings	7	9	5	6	4	6	7	9	5	6	7	7	8	9	8	9	7	7	6	10
Lake	2	2	2	3	2	3	3	3	1	1	3	3	3	4	3	4	3	4	3	4
Lassen	1	1	1	1	1	2	3	3	4	4	1	1	3	4	1	2	1	1	2	2
Los Angeles	205	245	190	239	194	267	257	328	273	309	267	301	228	253	246	276	279	299	206	224
Madera	24	28	18	23	22	31	26	33	28	31	29	33	28	31	23	24	30	32	36	37
Marin	3	3	2	3	2	2	2	3	4	4	4	4	3	3	4	4	4	4	4	5
Mariposa	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	2
Mendocino	7	9	6	6	4	5	6	7	9	10	6	6	5	6	5	8	9	9	6	10
Merced	46	55	49	62	49	68	54	69	59	68	38	42	35	39	28	36	28	30	28	33
Mono	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Monterey	25	30	22	27	13	18	23	29	24	28	24	27	24	26	23	26	21	22	20	27
Napa	6	7	2	3	2	3	6	8	6	7	6	7	6	7	6	7	6	6	6	6
Nevada	4	4	1	2	4	6	7	8	8	9	8	9	7	8	5	8	7	8	6	8
Orange	38	46	33	42	37	51	46	59	52	59	54	61	49	55	51	56	49	53	43	46
Placer	12	15	9	12	10	13	13	16	15	17	15	17	16	17	16	17	32	35	18	20
Plumas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Riverside	89	107	86	109	100	138	119	152	128	145	131	148	119	132	108	122	134	144	138	146
Sacramento	27	32	18	21	21	29	28	36	38	42	42	48	41	45	37	41	41	44	40	45
San Bernardino	158	189	164	206	152	210	198	253	223	252	235	265	176	195	165	178	148	159	184	198
San Diego	62	74	58	73	67	93	87	111	93	105	92	103	92	103	94	110	88	94	93	117
San Francisco	3	4	4	5	1	2	5	6	6	6	5	6	5	5	5	5	4	4	4	5
San Joaquin	84	99	90	113	86	119	102	131	116	131	111	126	105	117	101	113	86	93	94	97
San Luis Obispo	11	13	9	12	12	17	19	24	20	23	19	21	20	22	20	22	19	20	17	22
San Mateo	8	10	8	10	4	6	15	19	13	14	15	17	16	17	18	19	12	13	13	16
Santa Barbara	10	13	12	15	13	18	20	26	22	25	17	19	21	24	18	19	16	17	16	17
Santa Clara	27	32	28	35	25	35	36	47	30	34	32	36	43	48	33	42	32	35	31	50
Santa Cruz	4	5	4	6	2	3	5	6	5	6	6	6	6	7	4	6	7	8	6	7
Shasta	16	19	18	22	13	18	21	27	21	24	22	25	21	24	14	16	13	14	20	22
Siskiyou	16	20	15	19	16	20	20	26	19	22	18	21	16	17	16	17	17	18	16	18
Solano	14	16	14	17	8	11	14	18	17	19	22	24	23	25	24	27	25	27	19	30
Sonoma	13	16	14	17	12	17	15	20	20	23	20	23	20	22	20	28	28	30	26	30
Stanislaus	25	30	15	19	20	27	26	33	20	22	30	34	32	36	33	35	36	39	44	49
Sutter	3	4	4	5	2	3	4	5	5	6	3	4	4	5	5	6	5	5	4	4
Tehama	35	42	37	47	25	35	37	48	35	39	34	38	18	20	17	18	7	8	14	17
Tulare	27	32	31	39	31	43	34	43	37	42	37	41	31	34	34	42	45	47	51	66
Tuolumne	1	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	4
Ventura	23	27	23	29	25	34	27	34	29	32	32	36	30	33	33	35	29	32	31	35
Yolo	27	33	30	37	29	40	27	35	32	37	27	30	25	28	24	26	21	22	24	28
Yuba	3	4	3	4	2	3	2	3	4	5	8	9	11	12	4	5	4	4	4	12
Other Counties*	1	2	1	1	1	2	2	2	3	3	3	3	2	2	2	3	2	2	2	3
Total	1,327	1,589	1,261	1,587	1,226	1,691	1,592	2,033	1,742	1,971	1,717	1,937	1,602	1,777	1,559	1,756	1,624	1,744	1,611	1,883

* 2012 to 2021 data are not directly comparable to other years since an improved methodology is used, but is within 5 percent compared to the previous methodology.

* Other Counties include Alpine, Modoc, San Benito, Sierra and Trinity.

Note: Non-Retail diesel sales, which comprise approximately 52.8% of all diesel sales, are not reported in this chart.

Source: California Energy Commission, California Annual Retail Fuel Outlet Report Results (CEC-A15), 2010-2021 <https://www.energy.ca.gov/media/3874>

Row Labels	Sum of Population	Sum of CVMT	Sum of EVMT	Sum of Fuel Consumption	MPG
2021	49.01%	270,686,615	6,550,614	12,944	
Gasoline	94.14%	254,817,900	-	11,038	23.09
Diesel	3.00%	13,005,773	-	1,616	8.05
Electricity	1.57%	-	4,769,720	-	#DIV/0!
Natural Gas	0.16%	858,321	-	217	3.96
Plug-in Hybrid	1.13%	2,004,620	1,780,894	73	51.68
2028	50.99%	271,877,412	17,970,454	11,565	
Gasoline	89.91%	252,592,445	-	9,542	26.47
Diesel	3.51%	15,288,211	-	1,702	8.98
Electricity	4.28%	-	14,207,311	-	#DIV/0!
Natural Gas	0.18%	904,637	-	208	4.35
Plug-in Hybrid	2.11%	3,092,118	3,763,143	113	60.63
Grand Total	100.00%	542,564,026	24,521,068	24,509	

