

Appendix D

Air Quality and Greenhouse Gas
Modeling

Solar Mitigation for Natural Gas

	Size/year	T24NG kBTU/size/year	NT24NG kBTU/size/year	T24NG KBTU/Yr	NT24NG KBTU/Yr	Total KBTU/Yr	Conversion kWh/yr	Required Solar kW
Industrial Park	2,421,600.00	15.83	0.47	38,333,928.00	1,138,152.00	39,472,080	11,568,605	9,203.35
Total								9,203.35

SF 522917
 Acres 12

Conversions

kWh/kBTU 3.412
 Assumed Solar Generation 1257 Kwh/yr per nominal installed Kw Source: The Hub EIR
 Assumed Solar Efficiency 17.6 watts/sf (premium panels assumed) Source: The Hub EIR

Solar Mitigation for Electricity Demand

	Electricity Demand kWh/yr	Required Solar kW
Industrial Park	23,392,700	18,610
Total		18,610

SF	1057383
Acres	24

Conversions

kWh/kBTU	3.412
Assumed Solar Generation	1257 Kwh/yer per nominal installed Kw Source: The Hub EIR
Assumed Solar Efficiency	17.6 watts/sf (premium panels assumed) Source: The Hub EIR

Mitigation for EV Charging

EV Chargers

1	Number of Parking Spaces with EV Chargers	30	Mitigation Measure: 10% of total parking space
2	Percent of EV vehicles in Sacramento County - Residential	7%	Calculated using EMFAC 2021 (for passenger vehicles)
3	Connections per Charging Station	1	1 connection at each charging station
4	Average Charging Hours per Connection per Day	4	Note 1
5	Average Total Hours Charging per year for all Connections	43,800	Item 1 * Item 2 * Item 3 * Item 4 * 365
6	Typical Average Charging Rate for light duty vehicle (kWh/hr)	6	Note 2
	Typical Average Charging Rate for heavy duty (kWh/hr)		
7	Total kWh charged per year	262,800	Item 5 * Item 6
8	Total MWh charged per year	263	Item 7 / 1000
9	Public Charging Stations		
10	Average Efficiency of EV LDV (kWh/100 mi)	34.0	Note 3
11	Average Efficiency of EV LDV (miles per kWh)	2.9	100 mi / Item 10
12	Number of Equivalent Miles Charged per year (gasoline miles avoided)	772,941	Item 7 * Item 11
13			
14	SMUD CO2 intensity in 2026 (lbs/MWh)	186.1	Note 4
15			
16	CO2 running emission factor for gasoline vehicles in 2026 (g/mi)	281.1	Note 5
17			
18	Annual CO2 Emissions Saved through Charging (tons per year)	239.5	Item 12 * Item 16 converted to tons
19	Annual CO2 Emissions Saved through Charging (metric tons per year)	217.2	Convert Item 18 to metric tons
20	Annual CO2 Emissions from Electricity required to charge (metric tons per year)	22.2	Item 8 * Item 14 converted to metric tons
21	Net Annual CO2 Emissions Saved (metric tons per year)	195.1	Item 19 minus Item 20

Note 1: Drive Clean California states that it takes 4 to 6 hours to fully charge an EV. But one would not typically allow the vehicle to be empty before charging, thus assumed 3 hrs/charge.

Note 2: Drive Clean California states that EVs have battery capacities of 24 to 36 kWh and fully charge in 4 to 6 hours, so 6 kWh/hr.

Note 3: Average efficiency of 24 model year 2019 electric vehicles, per USDOE. Used only model year 2019 because vehicles will be more efficient in 2035 than in the past.

Note 4: 2026 operational year adjusted according to SMUD 2030 carbon neutrality goal

Note 5: From EMFAC 2021 for gasoline engines, all models and model years; calendar year 2026.

Mitigation for Truck Idling

		Units	Notes
CO2e Emission Factor for heavy duty vehicle	913	g/trip/day	Estimated using EMFAC2021
TRU Operation days/year	344	Days/year	
Average Daily Truck trips	1140	Trips	Traffic Study: Fehr and Peers
Total Carbon Dioxide Equivalent Saved from Truck Idling	395	MT/year	

Combined Mitigation Measures

Installation of Solar Panel System to replace Natural Gas Use	2,119
Installation of Solar Panel System to replace Electricity Demand	3,145
Installation of EV charging station (10 percent of total)	195
Loading Dock Electrification	395
Total Reduction	5,854
Total GHG emissions	25,059
Total GHG Emission after mitigation	19,206