Appendix D
Energy Calculations

ESA

D.1-1 Assumptions

Irwindale Housing Element and General Plan Update
Operational & Existing Assumptions

CalEEMod Inputs (Non-Default information only)

Project Location	City of Irwindale
County	Los Angeles
Air District	South Coast
RSA	9
Operational Year	2029
Utility Provider	Southern California Edison

Housing Sites Inventory

Site	Proposed Acres	Target Housing Type	Min. Density Proposed	Max Density Proposed	Assumed Density	VL/L	Estimated Units Mod.	Above Mod.	timated Total Capac
Site 1	10	Single-Family	8	18	12		84	36	120
Site 2	1	Apts/Condos	21	30	21	21			21
Site 3	4	Apts/Condos	21	30	21			84	84
Site 4	1	Apts/Condos	21	30	21	21			21
Site 5	1	Apts/Condos	21	30	21	11		10	
	1	Townhouses	8	14	12		12		33
								TOTAL PPOTENTIAL U	279

Source: Source: 2.0 Project Description, Proposed Housing Sites Inventory, Table 2-4 Last Update: 2/7/2025

Trip Generation:				AM Peak Hour Vol			PM Peak Hour Vol		
Project Area		**Size (DU)**	**Daily trip ends volume**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Site 1	Single-Family Residential	120	1132	21	63	84	71	42	113
Site 2	Affordable Housing	21	101	3	8	11	6	4	10
Site 3	Multi-family Residential	84	381	7	24	31	20	13	33
Site 4	Affordable Housing	21	101	3	8	11	6.000	4	10
Site 5	Multi-family Residential	22	100	2	6	8	5	4	9
	Affordable Housing	11	53	2	4	6	3	2	5
	Total	279	1868	38	113	151	111	69	180

Source: LINSCOTT, LAW & GREENSPAN - Traffic Analysis Report Table 2-3
*Affordable housing is assumed to be multi-family housing ITE Land Use Code 221 in CalEEMod Last Update: 2/7/2025

Potential Dwelling Units by Housing Site

Site	Number of parcels	Acreage	Potential Dwelling Units (a)	Service Population	Single-Family Service Population	Multi-Family Service Population
1	1	10	120	434	434	-
2	1	1	21	76	-	76
3	1	4	84	303	-	303
4	3	1	21	76	-	76
5	15	2	33	119	-	119
TOTALS	21	18	279	1008	434	574

Note: Affordable housing DU are considered multi-family homes.
Source: LINSCOTT, LAW & GREENSPAN - Traffic Analysis Report Table 2-3
Last Update: 2/7/2025

Landscape Sq Ft - Condo/Townhouse		
Perecent of building sq ft	10%	Assumed
CaleeMod default bldg sq ft	152639	
Landscape Area	15264	<--Enter into CaleeMod

ITE Land Use Code 221

Adjusted landscape Sq Ft - Single Family Homes	
Default acres	38.96
Adjusted acres	10
Adjusted Sq Ft	435600
Driveway default Sq Ft Per Unit	480
Units	120
Total driveway Sq Ft	57600
Home footprint default Sq Ft	234000
adjusted landscaping value based on CalEEMod methodology	144000

<--Enter into CaleeMod

Population Projection	
Units	279
Average household size	3.61
Projected new residents	1008
Existing City Population	1441
Population change %	70%

Source: 2.0 Project Description, Housing Sites Inventory Capacity Analysis Last update: 2/7/2025

TOTAL VMT SUMMARY

PROJECT AREA	Home Based VMT Per Capita[1]	Total Daily VMT			Total Annual VMT
			Single-Family Service Population	Multi-Family Service Population	
Site 1	16	6944	6944	-	2534560
Site 2	17.3	1312	-	1311	478880
Site 3	16.2	4912	-	4912	1792880
Site 4	16.2	1228	-	1228	448220
Site 5	13.9	1656	-	1655	604440
Total		**16052**	5858980		**5858980**

[1] Source: LINSCOTT, LAW & GREENSPAN - Traffic Analysis Report Table 3-1

D.1-2 Operational Energy Calculations and Modeling

Irwindale GPU
Operational Energy Demand

Electricity	kWh/yr	MWh/yr
Project		
Condo/Townhouse High Rise	582,868	583
Single Family Housing	827,418	827
Project Total Building Energy	**1,410,286**	**1,410**
Project Total	**1,410,286**	**1,410**
Total (including water, see below)	**1,500,286**	**1,500**

Source: California Air Resources Board, CalEEMod, Version 2022.01

Electricity	MWh/yr (Total Consun
Total SCE, 2029 Forecast	118,170,000
Project Annual	1,500
Percent Project of SCE	0.0013%

Source: CEC, CED 2023 Baseline Forecast – SCE, California Energy Demand Forecast, 2023 - 2040 Baseline Forecast. https://efiling.energy.ca.gov/GetDocument.aspx?tn=254247&DocumentContentId=89615. Accessed December 2024.

Water	Mgal/yr	MWh/yr
Project		
Condo/Townhouse High Rise	6.2	42.1
Single Family Housing	6.9	47.2
Project Total	**13.129**	**90**

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 2022.01
Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)
Project		
Condo/Townhouse High Rise	1,765,989	1,706,270
Single Family Housing	4,600,242	4,444,678
Mobile Sources	553,606	534,885
Project Total Building Energy	6,366,231	6,150,948
Total	**6,919,837**	**6,685,833**

Source: California Air Resources Board, CalEEMod, Version 2022.01
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_EPG0_VGTH_btucf_a.htm. Accessed March 2020.)

Natural Gas	million cubic foot (cf)
SoCalGas 2029 Forecast	815,616
Project Annual	6.686
Percent Project of SoCalGas	0.0008%

Source: California Gas and Electric Utilities, 2024 California Gas Report, p. 185, 2024. https://www.socalgas.com/sites/default/files/202

Irwindale GPU
Project Energy Analysis
Fuel Usage from VMT

Annual VMT (Traffic Study)[4]:	5,858,980	miles/year

Fuel Type:[1]	Gasoline	Diesel	Electricity	Natural Gas	Plug-in Hybrid
Percent:	86.6%	5.3%	5.3%	0.3%	2.5%
Miles per Gallon Fuel:	26.9	9.1	-	4.5	61.4
Annual VMT by Fuel Type (miles):	5,074,930	310,440	312,062	17,799	143,750
Annual Fuel Usage (gallons):	188,636	34,163	-	553,606	2,342

	Los Angeles County Fuel Consumption [3]	
	Gasoline	Diesel
Los Angeles County (2023):	3,039,000,000	455,974,843
Project Total	190,978	34,163
Percent Net Project of Los Angeles County:	0.006%	0.007%

Notes:

1. California Air Resources Board, EMFAC2021 (LA County; Annual; 2029', 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, 2024. Available at: https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed February 2025. Diesel is adjusted to account for retail (63.3%) and non-retail (36.4%) diesel sales.
4. Estimated in operations data and assumptions