

Appendix G: Greenhouse Gas

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3168.0017 Fresno DNCP and FCSP

CalEEMod Methodology and Assumptions

The following project-specific assumptions and modeling parameters were incorporated into the analysis.

Construction

- CalEEMod’s “General Office Building”, “General Light Industry”, “Apartments Mid Rise”, and “Regional Shopping Center” were selected to model the planning areas development.
- CalEEMod’s default phase ratios and phase lengths were used. Construction was expected to begin early 2016 and would be operational 2039.
- Equipment population and activity are based on CalEEMod defaults for each phase type. The default construction equipment activity (hours per day) was not modified from the defaults presented by CalEEMod.
- Land use quantities for each land use type was from the Traffic Memorandum from Fehr and Peers and is presented in Table 1.

Table 1: Land Use Assumptions

Land Use	Quantity
Downtown Neighborhood Community Plan	
Apartments Mid Rise	3,697 DU
General Light Industry	2,900 ksf
General Office Building	350 ksf
Regional Shopping Center	2,000 ksf
Fresno Corridor Specific Plan	
Apartments Mid Rise	6,293 DU
General Light Industry	150 ksf
General Office Building	1,600 ksf
Regional Shopping Center	3,900 ksf
Notes: DU = dwelling units ksf = thousand square feet Source: Fehr and Peers.	

Operation

- The Traffic Memorandum from Fehr and Peers was utilized to generate the trip rate for each land use type on weekdays and on weekends. Table 2 shows the revised trip generation for the Project.

Table 2: Revised Trip Generation

Land Use	Revised Weekday Trip Rate (/size/day)	Revised Saturday Trip Rate (/size/day)	Revised Sunday Trip Rate (/size/day)
Apartments Mid Rise	6.65	7.16	6.07
General Light Industry	6.97	1.32	0.68
General Office Building	11.01	2.37	0.98
Regional Shopping Center	42.94	49.97	25.24

Source: Fehr and Peers.

Electricity Emission Factor

The default CalEEMod emission factors for Pacific Gas & Electric (from the CEC's year 2006 data) are as follows:

- Carbon dioxide: 641.35 pounds per megawatt hour (lbs/MWh)
- Methane: 0.029 lb/MWh
- Nitrous oxide: 0.006 lb/MWh

It is assumed that the Renewable Electricity Standards would have taken effect by 2020. The Renewable Electricity Standard requires that electricity providers include a minimum of 33 percent renewable energy in their portfolios by the year 2020. In 2006, Pacific Gas & Electric had 12.6 percent renewable energy in its portfolio (California Public Utilities Commission 2011). Therefore, without the renewable energy, PG&E's emission factors in 2006 would have been (unadjusted energy intensity):

- Carbon dioxide: 733.81 lbs/MWh
- Methane: 0.033 lb/MWh
- Nitrous oxide: 0.007 lb/MWh

The required 33-percent reduction would be anticipated by the year 2020. The emission factors for 2020 therefore are estimated by reducing the unadjusted 2006 emission factors by 33 percent and are as follows:

- Carbon dioxide: 491.65 lbs/MWh
- Methane: 0.022 lb/MWh
- Nitrous oxide: 0.005 lb/MWh

Electricity Consumption

CalEEMod has three categories for electricity consumption: electricity that is impacted by Title-24 regulations, non-Title-24 electricity, and lighting. The Title 24 uses are defined as the major building envelope systems covered by California's Building Code Title 24 Part 6, such as space heating, space cooling, water heating, and ventilation. Lighting is separate since it can be both part and not part of Title-24. Since lighting is not considered as part of the building envelope energy budget, CalEEMod does not consider lighting to have any further association with Title 24 references in the program. Non-Title 24 includes everything else such as appliances and electronics. Total electricity consumption in CalEEMod is divided into the three categories. The percentage for each category is determined by using percentages derived from the CalEEMod default electricity intensity factors. The percentages are then applied to the electricity consumption to result in the values used in the analysis. A reduction of 25 percent for new residential development and a 30 percent reduction for new nonresidential development was used for the analysis.

Solid Waste

CalEEMod defaults were altered to reflect the City of Fresno's goal of 75 percent waste diversion goal.

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