Sacramento Metropolitan Air Quality Management District
Tips for Using CalEEMod

SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

CalEEMod™

Introduction

The California Emission Estimator Model (CalEEMod) is a statewide model that assists project proponents, land use jurisdictions (lead agencies), consultants, and air districts in complying with the California Environmental Quality Act (CEQA) by estimating criteria pollutant and greenhouse gas emissions from land use development projects. Prior to approving a project, a lead agency is required by CEQA to determine if the project will have an impact on the environment, including air quality and climate change, and require appropriate mitigation for those impacts. CalEEMod is intuitive and the User's Guide is well documented. The installation files, User's Guide, User's Tips, and other supporting documents can be downloaded free of charge from the CalEEMod website: www.caleemod.com.

Sacramento Metropolitan Air Quality Management District (Sac Metro Air District) staff developed these *Tips for Using CalEEMod* to guide users through critical components of the model for projects within the boundaries of Sacramento County, including its cities. Following each tip is the information source: "CalEEMod" refers to a user tip from the CalEEMod website published February 2018; "Sac Metro Air District" refers to a Sacramento-specific tip. The tips are organized by the main CalEEMod screen sections.

General Information

1. If the following error message "*Unexpected error from external database driver (1)*" appears when importing and saving an Excel file as .xls, you are not using the most current/recent version of CalEEMod. To fix this error, fully uninstall CalEEMod and install version 2016.3.2.25 which is available from the Download Model tab of www.caleemod.com. (CalEEMod User Tips #49)
2. The Project Characteristics and Land Use screens are the minimum required inputs for the model to calculate project emissions. Project-specific information should be entered if available (e.g., construction schedule, construction equipment type, results of traffic study, predicted water usage, etc.). (Sac Metro Air District, CalEEMod User Tips #1 and #5)
3. CalEEMod is a linear model. Unless the "Cascade Default" box is unchecked, changing data in earlier screens will trigger the software to apply the defaults related to the new data throughout the rest of the program. (CalEEMod User Tips #2)
4. If the "Cascade Default" box is unchecked, default values will not be populated in subsequent screens. Unless all the necessary input parameters required for a proper analysis are known, run the model at least once with "Cascade Default" box checked to allow the defaults to be populated. Then, to change project parameters (e.g., number of dwelling units, building square footage, etc.) without cascading new defaults in later screens, uncheck the "Cascade Default" box in the Land Use screen. Similarly, to preserve the 'user defined' defaults already inputted (either by hand or .xls file) and run the model with different project parameters, un-check the "Cascade Default" box. (CalEEMod User Tips #3)
5. Follow these steps to open, review, or print a report from a previously saved file: 1) open the file, 2) uncheck the "Cascade Defaults" box in the upper right hand, 3) review desired tabs, and 4) run reports. (CalEEMod User Tips #4)
6. To activate cells, click on the cell or use the tab key to activate the next cell. The Enter key does not activate subsequent cells. (CalEEMod User Tips #6)
7. The Template to "Import CSV" Data and Defaults file (found on the www.caleemod.com User's Guide webpage) provides the necessary header row and dropdown lists of input characteristics up to 100

assigned to residential or split between non-residential land uses if there is no residential land use. (CalEEMod User Tips #13)

20. For commercial uses, input the building size square footage, not the lot size. (Sac Metro Air District)

Construction

21. The parking land use type is excluded from the ROG calculations for non-residential interior/exterior architectural coatings, but is included in the ROG calculations for parking lot paint. (CalEEMod User Tips #26)

22. The model requires at least one construction phase to calculate emissions. To calculate only the operational emissions, delete all but one construction phase and zero out the default number of equipment and trip lengths. (CalEEMod User Tips #15)

23. To calculate only construction emissions, enter the following land uses at a minimum: 1) Other Asphalt Surfaces - specify the correct acreage of asphalt for off-gassing emissions; 2) User Defined Residential and User Defined Commercial - specify the correct building square footage for architectural coating emissions; and 3) ensure the total acreage at the bottom of the Land Use screen is accurate as this is the basis for the default construction schedule and equipment list. (CalEEMod User Tips #16)

24. When using the Excel spreadsheet to modify construction dates, use the format of 4-digit year/2-digit month/2-digit day (CalEEMod User Tips #17). Note that the model will be unable to revert back to the original default schedule. (CalEEMod User Tips #18)

25. If the sequence of a construction schedule is incorrect (e.g., construction ends before it starts), the model will reset the construction phase dates to original defaults. The error can be fixed by changing the construction schedule in a separate Excel input file and then importing that new input file into the model. (CalEEMod User Tips #19)

26. The default equipment list and construction schedule is only valid for 35-acre and smaller projects that have buildings of no more than 4 stories tall. Otherwise, provide project specific information. (Sac Metro Air District)

27. For construction equipment calculations, the user should evaluate whether the default equipment list, including equipment types and numbers, horsepower ratings, hours of operation, and duration of phases, are appropriate. If changes are made to the equipment list, the program will not change the construction timeline or vice versa. Be sure to modify the construction information where needed. (CalEEMod User Tips #20)

28. As a general rule, if the construction schedule is shortened by ½, the number of equipment needs to be doubled. (Sac Metro Air District)

29. If modifying the default off-road construction equipment, add or modify the number of construction equipment pieces. If a default equipment type is not being used, zero out the number of pieces but do not delete the equipment type. Otherwise, the model will reinsert the default equipment type and calculate emissions based on original default values. No emissions will be calculated from equipment types listed with zero number of pieces. (CalEEMod User Tips #21)

30. Changes to the off-road equipment on the Construction screen will not automatically adjust the horsepower (HP) or load factor for the modified equipment type. Select the "default" button to load the appropriate default HP and load factor data. Non-default HP and load factor values require justification in the "Remarks" box at the bottom of the screen. (CalEEMod User Tips #22)

31. Increases to the off-road equipment default HP greater than the ranges listed in Table 3.4 of Appendix D in the User's Guide (generated from CARB's off-road inventory) will zero out the construction

emissions. Stay within the ranges provided in Table 3.4. A programming modification will be considered in a future upgrade to allow higher HP inputs. (CalEEMod User Tips #23)

32. Water truck(s) used during construction were counted during a vendor trip survey covering all phases of construction (e.g., site preparation, grading, building construction, etc.). The default number of water trucks (vehicles per unit/square foot) was developed based on that survey and are included in the Building Construction phase. Additional vehicles may be added (on the Construction – Trips and VMT screen) under any construction phase. (CalEEMod User Tips #24)

33. The default construction data does not include material haul amounts, demolition or trenching phase information. Enter project specific information if the project includes these activities. To capture concrete truck trips that occur in phases other than Building Construction, go to the Construction - Trips and VMT screen. (Sac Metro Air District)

Operational

34. For a City Park, Golf Course, or Recreational Swimming Pool land use, the green space portion of a City Park or Golf Course land use is excluded from the ROG calculations for architectural coatings and consumer products, but is included in the ROG calculations for pesticide/fertilizer use. Furthermore, the pool surface area portion of a Recreational Swimming Pool land use is excluded from the ROG calculations for architectural coatings and consumer products. (CalEEMod User Tips #36)

35. The parking land use type is excluded from the ROG calculations for non-residential interior/exterior architectural coatings, but is included in the ROG calculations for parking lot paint. (CalEEMod User Tips #37)

36. If the project will have unpaved roads during the operational phase, select the CARB Unmitigated Unpaved Road Statewide Emission Inventory Method option for calculating particulate matter emissions for unpaved road dust. (Sac Metro Air District)

37. Trip rates reflect the vehicle activity related to the type of land use. Default residential trip rates for condos and mid- and high-rise apartments are the same as low-rise apartments, which is the baseline scenario (suburban area) from the CAPCOA GHG mitigation measure of increased diversity of urban and suburban development (mixed use). Thus, the mitigation measure of increased diversity will result in the appropriate reduction in VMT. (CalEEMod User Tips #27)

38. Operational vehicle emission factors (on the Operational-Mobile screen, Vehicle Emissions tab) depend on the vehicle activity. For example, running exhaust and evaporative running loss emissions are in grams per vehicle mile traveled (VMT) and start-up, idling, and all other evaporative emissions are in grams per trip. (CalEEMod User Tips #28)

39. To eliminate the emissions from a specific vehicle class category, zero out the emission factors on Operational-Mobile screen's Vehicle Emissions tab. (CalEEMod User Tips #29)

40. Consult with Sac Metro Air District staff before modifying any vehicle emissions factors or the fleet mix. (Sac Metro Air District)

41. For Sacramento County, the model assumes no hearths. If the project includes hearths, modify the inputs and be sure to mitigate the excess emissions. Sac Metro Air District's Rule 417 regulates hearth installations. (Sac Metro Air District)

42. The percentage of wastewater treatment (i.e., septic, aerobic, or lagoons) should not exceed 100 percent and the waste digestion (i.e., anaerobic digestion with cogeneration or without) should total either 100 percent or zero percent. If wastewater treatment is aerobic or lagoon, there needs to be

digestion to handle the waste, so digestion should total 100 percent. If the wastewater treatment is septic, digestion could be zero percent. A reminder box is triggered if input is incorrect. (CalEEMod User Tips #34)

43. The wastewater treatment method defaults represent the Sacramento Regional County Sanitation District wastewater treatment plant. If this plant does not serve the project, consult with the lead agency to determine the appropriate wastewater treatment types and percentages. (Sac Metro Air District)

44. If the information is known, override the default landfill gas capture types on the Solid Waste screen with the type of system employed at the landfill that will serve the project. (Sac Metro Air District)

45. Consult with Sac Metro Air District staff before using the Stationary Sources screens. (Sac Metro Air District)

Mitigation

46. Alternative fuel options (e.g., CNG, bio-diesel) are provided for each construction equipment type. It is the responsibility of the lead agency to ensure the equipment operated by the project actually uses alternative fuel. (CalEEMod User Tips #39)

47. CNG equipment available for mitigation is restricted to those equipment and horsepower ranges listed in Table 3.6 of Appendix D. If CNG is selected for a non-valid piece of equipment, emissions will not be quantified. (CalEEMod User Tips #40)

48. Construction equipment types from all construction phases are combined on the Mitigation screen; thus, the ability to apply different mitigation measures to the same types of equipment is limited. For example, the model does not provide the option to apply diesel particulate filter mitigation to some dozer and biodiesel fuel mitigation to other dozers in the project's fleet mix. However, the model will read separate mitigation from the same equipment type from an imported CSV (Excel spreadsheet). (CalEEMod User Tips #41)

49. Off-road equipment emission factors in the construction phase are based on the statewide fleet mix from CARB's off-road inventory model per year and HP range (Table 3.4 in Appendix D of the User's Guide). Engine emission factors for various tiers (Table 3.5 in Appendix D of the User's Guide) are based on Carl Moyer standards. In some instances, the statewide fleet mix average for a particular equipment type, year, and HP may be lower than the engine tier standard, which generates higher mitigated emissions.   Use caution in choosing the appropriate tier mitigation. (CalEEMod User Tips #42)

50. Select a "Project Setting" type on the Mitigation, Traffic, and Land Use & Site Enhancement screen for the reductions from selected mitigation measures to be calculated properly. (Sac Metro Air District)

51. The project setting descriptions under the Traffic mitigation are defined in the CAPCOA Quantifying GHG Mitigation Measures document (http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf) except that Suburban is called Low Density Suburban and Compact Infill is called Urban Center. (Source CalEEMod User Tips #43)

52. Sac Metro Air District's *Recommended Guidance for Land Use Emission Reductions* (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation) provides guidance on mitigation measures that can be used in CalEEMod and the requirements that must be met to obtain credit for the selected measures. (Sac Metro Air District)

53. Using Neighborhood Electric Vehicles for GHG mitigation must be fully justified because VMT reductions have not been demonstrated in the CAPCOA documentation. (CalEEMod User Tips #44)

Reports

54. To modify the Excel report to show mini-headers on each page, use the page set-up function to repeat the top 3 lines, and then add a header centered to show "page 1 of ?" in the place of the "Page 1 of 1". (CalEEMod User Tips #48)
55. The output report provides either peak daily emissions from summer or winter emission factors, or annual emissions. Total quarterly construction emissions results are provided in the annual report. Total quarterly operation emissions results can be calculated by multiplying the peak daily by 90 days (i.e., one quarter of year), or dividing the annual by four (i.e., one quarter of year). (CalEEMod User Tips #46)
56. An "Unhandled Exception" error message is caused by incorrect data inputs This may occur if a mitigation input value is outside the allowable range of reductions (as outlined in CAPCOA's Quantifying GHG Mitigation Measures document) or the input is zero when model expects a positive integer. CalEEMod will record the error message in a log.log file. In the error message box, users have an option to contact CalEEMod Tech Support and the log.log file will be automatically attached. (CalEEMod User Tips #45)
57. The output report for Vegetation identifies the CO2e emissions reductions (or increases) in units of metric tons, not metric tons per year. Divide the total metric tons by the anticipated life of the project to calculate annual emissions. (CalEEMod User Tips #47)
58. Provide the CalEEMod input files and the summer, winter and annual reports for each model run to the Sac Metro Air District for review. (Sac Metro Air District)

Direct CalEEMod questions to the following Sac Metro Air District staff.

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For technical issues associated with downloading, installing, and running the model, email CalEEMod_TechSupport@trinityconsultants.com. (CalEEMod User Tips #50)