



CalEEMod
California Emissions Estimator Model

Appendix H
Comparison to CalEEMod Version 2020.4.0

Prepared for:
**California Air Pollution Control Officers Association
(CAPCOA)**

Prepared by:
ICF
in collaboration with
**Sacramento Metropolitan Air Quality Management
District, Fehr & Peers, STI, and Ramboll**

**April 2022
CalEEMod Version 2022.1**



Table of Contents

	Page
1	What key updates are included in CalEEMod Version 2022.1? H-1
2	What key updates are included in the User's Guide for CalEEMod Version 2022.1? H-1

1 What key updates are included in CalEEMod Version 2022.1?

Table H-1 provides a general comparison of key functions and features between CalEEMod Version 2022.1 and the prior version of CalEEMod (Version 2020.4.0). Table H-2 provides a more detailed comparison of the individual data fields for these two versions. The table identifies the data field names for both versions of CalEEMod. It further notes if the data field itself or if the assumptions/ analytics underlying defaults (if any) are new, updated, not updated, or removed in CalEEMod Version 2022.1. Table H-3 compares the quantified emission reduction measures in CalEEMod Version 2022.1 to the prior version, noting if the measure is new, removed, updated, or not updated. All climate risk reduction and health and equity measures are new and are therefore not specifically identified in Table H-3.

2 What key updates are included in the User Guide for CalEEMod Version 2022.1?

The User Guide is comprised of the main document plus Appendices A through H. Table H-4 contains a list of the changes that were made to reflect the updates contained in CalEEMod version 2022.1, relative to the prior version of CalEEMod (version 2020.4.0). Please note that several of the appendices have been renumbered.

Table H-1. General Comparison of CalEEMod 2022.1 with Previous CalEEMod (Version 2020.4.0)

Function or Feature	CalEEMod 2022.1	CalEEMod Version 2020.4.0
Accessing the program	Web-based program accessed directly through a browser at http://www.caleemod.com .	Downloadable program that required user installation.
Navigating the interface (i.e., key features)	<ul style="list-style-type: none"> • Top Bar located in the top right-hand corner of the interface has options to create a new model run, open a saved model run, or delete a prior run. • Next/back buttons are the same as CalEEMod 2020.4.0. • Side Navigation Bar located on the left-hand side of the interface to navigate across non-sequential screens. • Tabular View and Data List View display values for variables in two different viewing modes, depending on user preference. 	<ul style="list-style-type: none"> • “Home” on the Menu Bar has options to create a new model run, open a saved model run, save the model run, or exit the program. • Next button in lower right corner of interface to move between sequential screens. • Menu Bar located at the top of the interface to quickly navigate across non-sequential screens. • Data Grid where values for variables defined across the top of the grid are to be filled in with data.
Creating a model run	<ul style="list-style-type: none"> • Option 1: From the Home screen, click the “New Project” button. • Option 2: Click the Top Bar and click the “New Project” button. • Option 3: From the Home screen, click the Map component on the Side Navigation Bar. 	<ul style="list-style-type: none"> • Option 1: Each time the program is opened, the Project Characteristics screen defaulted to a new model run. • Option 2: If the program was already open, users click “Home” on the Menu Bar, and then “New Project.”
Saving a model run	Progress on a model run is automatically saved because projects are automatically cached.	To not lose progress on a model run before closing the program, users click “Home” on the Menu Bar, then “Save” or “Save as” to download an .xls input file of the model run.
Opening a saved model run (cached or local file)	Users click the Top Bar and then click the project’s name.	Users click “Home” on the Menu Bar, then “Open Project” to upload the previously saved .xls input file of the model run.
Downloading a model run	Users click the Top Bar, select the desired model run by checking the box to the left of the project name, and click the down arrow icon to download a .json input file of the model run.	Same as saving a model run (see above).

Function or Feature	CalEEMod 2022.1	CalEEMod Version 2020.4.0
Uploading a model run (i.e., accessing a non-cached or non-local model run)	Provide the .json input file to the intended recipient. Recipient opens caleemod.com on their computer. <ul style="list-style-type: none"> • Option 1: Click the Top Bar and click the up arrow icon to upload the .json input file of the model run. Option 2: From the Home screen, click the “Upload Project” button.	Same as opening a saved model run (see above).
Deleting a model run	Click the Top Bar, select the desired model run by checking the box to the left of the project name, and click the trash can icon.	User clicks “Home” on the Menu Bar, then “New Project,” then “OK.”
Exiting the program	<ul style="list-style-type: none"> • Less applicable. Simply close the tab in your browser. 	<ul style="list-style-type: none"> • Option 1: Click “Home” on the Menu Bar, then “Exit.” • Option 2: Click the “X” icon in the top-right corner of the program.
Troubleshooting the program (i.e., technical issues associated with downloading, installing, and running the model).	Send an email to caleemod@airquality.org .	Sent an email to CalEEMod_TechSupport@trinityconsultants.com .

Table H-2. Comparison of Data Fields in CalEEMod 2022.1 with Previous CalEEMod (Version 2020.4.0)

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Home		
New Project	New Project	Described above in Table H-1.
Upload Project	Open Project	Described above in Table H-1.
Start a New Project		
Project Name	Project Name	Not updated
Land Use Scale	-	New
Land Use Type	n/a (defined in the Land Use screen)	Updated
Land Use Subtype	n/a (defined in the Land Use screen)	Updated
Define Project Center Point		
All	-	All new.
Map		
All	-	All new.
Project Detail (formerly Project Characteristics)		
Project Name	Project Name	Not updated
Automatic Updates to Default Values	Cascade Defaults and Default button	Updated
Lead Agency	-	New
Quantify emissions for []	-	New
Locational Context	Land Use Setting from Mitigation screen	Updated
Analysis Level for Defaults	-	New
County	Project Location	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Air District	Project Location	Updated
Air Basin	Project Location	Not updated
Windspeed	Windspeed	Updated
Precipitation days per year	Precipitation Frequency	Updated
CEC California Electricity Demand Forecast Zone	CEC Forecasting Climate Zone	Updated
TAZ	-	New
Start of Construction	Start of Construction	Not updated
Operational Year	Operational Year	Not updated
-	CEC Forecasting Climate Zone Look-up button	Removed (EDFZ automatically identified based on user identified location)
-	Apply EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule	Removed (emission factors account for SAFE Rule)
Utility Information		
Electric Utility	Select Utility Company from Project Characteristics screen	Updated
Operations GHG Emission Factors (electricity)	-	New
Gas Utility	-	New
CO ₂ Intensity Factor	CO ₂ Intensity Factor from Project Characteristics screen	Updated
CH ₄ Intensity Factor	CH ₄ Intensity Factor from Project Characteristics screen	Updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
N ₂ O Intensity Factor	N ₂ O Intensity Factor from Project Characteristics screen	Updated
Pollutants		
Total Organic Gases (TOG)	-	New
Reactive Organic Gases (ROG)	Reactive Organic Gases (ROG) from Project Characteristics screen	Not updated
Carbon Monoxide (CO)	Carbon Monoxide (CO) from Project Characteristics screen	Not updated
Sulfur Dioxide (SO ₂)	Sulfur Dioxide (SO ₂) from Project Characteristics screen	Not updated
Particulate Matter 10 Exhaust (PM10 Ex)	Particulate Matter 10um (PM10) from Project Characteristics screen	Not updated
Particulate Matter 2.5 Exhaust (PM2.5 Ex)	Particulate Matter 2.5um (PM2.5) from Project Characteristics screen	Not updated
Particulate Matter 10 Dust (PM10 Dust)	Fugitive 10 um (PM10) from Project Characteristics screen	Not updated
Particulate Matter 2.5 Dust (PM2.5 Dust)	Fugitive 2.5 um (PM2.5 Dust) from Project Characteristics screen	Not updated
Particulate Matter 10 Total (PM10 Total)	-	New
Particulate Matter 2.5 Total (PM2.5 Total)	-	New
Biogenic Carbon Dioxide (CO ₂)	Biogenic Carbon Dioxide (CO ₂) from Project Characteristics screen	Not updated
Non-Biogenic Carbon Dioxide (CO ₂)	Non-Biogenic Carbon Dioxide (CO ₂) from Project Characteristics screen	Not updated
Carbon Dioxide (CO ₂)	Carbon Dioxide (CO ₂) from Project Characteristics screen	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Methane (CH ₄)	Methane (CH ₄) from Project Characteristics screen	Not updated
Nitrous Oxide (N ₂ O)	Nitrous Oxide (N ₂ O) from Project Characteristics screen	Not updated
Refrigerants (CO ₂ e)	-	New
CO ₂ Equivalent GHGs (CO ₂ e)	CO ₂ Equivalent GHGs (CO ₂ e) from Project Characteristics screen	Not updated
Construction Thresholds - Daily	-	New
Construction Thresholds - Quarterly	-	New
Construction Thresholds - Annual	-	New
Operations Thresholds - Daily	-	New
Operations Thresholds - Quarterly	-	New
Operations Thresholds - Annual	-	New
Land Use		
Type	Land Use Type	Updated
Subtype	Land Use Subtype	Updated
Unit	Unit Amount	Updated
Size	Size Metric	Updated
Lot Acreage	Lot Acreage	Updated
Building Square Feet	Square Feet	Updated
Landscape Area	-	New
Special Landscape Area	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Recreational Building Area	Recreational Swimming Pool Building Square Feet	Not Updated
Population	Population	Updated
Description	-	New
Predominant Soil/Site Soil Type	-	New
Construction Phases		
Enable Auto-Scheduler	n/a (automatic)	Updated
Phase Name - Vertical Construction	Phase Name	Not updated
Phase Type - Vertical Construction	Phase Type	Not updated
Start Date - Vertical Construction	Start Date	Not updated
End Date - Vertical Construction	End Date	Not updated
Days/Week - Vertical Construction	Days/Week	Updated
Work Days per Phase - Vertical Construction	Total Days	Not updated
Phase Description - Vertical Construction	Phase Description	Not updated
Linear Land Use Type Construction Workdays	-	New
Phase Name - Linear Construction	-	New
Phase Type - Linear Construction	-	New
Start Date - Linear Construction	-	New
End Date - Linear Construction	-	New
Days/Week - Linear Construction	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Work Days per Phase - Linear Construction	-	New
Phase Description - Linear Construction	-	New
Off-Road Equipment		
Equipment Type	Equipment Type	Not updated
Fuel Type	-	New
Engine Tier	-	New
Number/Day	Unit Amount	Not updated
Hours/Day	Hours/Day	Not updated
Horsepower	HorsePower (HP)	Updated
Load Factor	Load Factor	Updated
Off-Road Equipment Emission Factors		
All fields	-	New
Dust from Material Movement		
Water Exposed Area	-	New
Frequency	-	New
PM10 % Reduction	-	New
PM2.5 % Reduction	-	New
Phase Type	Phase Name	Updated
Material Imported	Material Imported	Not updated
Material Exported	Material Exported	Not updated
Size Metric	Size Metric	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Material Import/Export Phased?	Material Import/Export Phased?	Not updated
Mean Vehicle Speed	Mean Vehicle Speed	Not updated
Total Acres Graded	Total Acres Graded	Not updated
Material Moisture Content Bulldozing	Material Moisture Content Bulldozing	Not updated
Material Moisture Content Truck Loading	Material Moisture Content Truck Loading	Not updated
Material Silt Content	Material Silt Content	Not updated
Demolition		
Water Demolished Area	-	New
Frequency	-	New
PM10 % Reduction	-	New
PM2.5 % Reduction	-	New
Phase Name	Phase Name	Updated
Phase Type	-	New
Size Metric	Size Metric	Not updated
Unit Amount	Unit Amount	Not updated
Trips and VMT		
Worker and Vendor Trip Length Data Source	-	New
One-Way Trips/day - Worker	# Trips Worker	Not updated
Trip Length - Worker	Trip Length Worker	Updated
Vehicle Class - Worker	Vehicle Class Worker	Updated
One-Way Trips/day - Vendor	# Trips Vendor	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Trip Length - Vendor	Trip Length Vendor	Updated
Vehicle Class - Vendor	Vehicle Class Vendor	Not updated
One-Way Trips/day - Hauling	# Trips Hauling	Not updated
Trip Length - Hauling	TripLength Hauling	Not updated
Vehicle Class - Hauling	Vehicle Class Hauling	Not updated
One-Way Trips/day - Onsite truck	-	New
Trip Length - Onsite truck	-	New
Vehicle Class - Onsite truck	-	New
On-Road Fugitive Dust		
Control Strategy	-	New
Strategy Active - Water unpaved roads twice daily	-	New
Strategy Active - Apply dust suppressants to unpaved roads	-	New
Strategy Active - Limit vehicle speeds on unpaved roads to 25 mph	-	New
Strategy Active - Sweep paved roads once per month	-	New
PM2.5 % Reduction	-	New
PM10 % Reduction	-	New
Phase Name	Phase Name	Not updated
% Pave Worker	% Pave Worker	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
% Pave Vendor	% Pave Vendor	Not updated
% Pave Hauling	% Pave Hauling	Not updated
% Pave Onsite Truck	-	New
Road Silt Loading	Road Silt Loading	Not updated
Material Silt Content	Material Silt Content	Not updated
Material Moisture Content	Material Moisture Content	Not updated
Average Vehicle Weight	Average Vehicle Weight	Not updated
Mean Vehicle Speed	Mean Vehicle Speed	Not updated
Architectural Coatings		
Phase Name	Phase Name	Updated
Phase Type	-	New
Residential Interior VOC	Residential Interior VOC	Updated
Non Residential Interior VOC	Non Residential Interior VOC	Updated
Residential Exterior VOC	Residential Exterior VOC	Updated
Non Residential Exterior VOC	Non Residential Exterior VOC	Updated
VOC for Parking Paint/Linear Paint	VOC for Parking Lot Paint	Updated
Residential Interior Area	Residential Interior Area	Not updated
Non Residential Interior Area	Non Residential Interior Area	Not updated
Residential Exterior Area	Residential Exterior Area	Not updated
Non Residential Exterior Area	Non Residential Exterior Area	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Parking/Linear Area	Parking Area	Not updated
Paved Area		
All fields	-	New
Electricity		
All fields	-	New
Vehicle Data – Default (formerly Vehicle Trips)		
VMT Estimation Source	-	New
Land Use Subtype	Land Use SubType	n/a (defined in the Land Use screen)
Size	Size Metric	n/a (defined in the Land Use screen)
Weekday Trip Rate	WkDy Trip Rate	Not updated
Saturday Trip Rate	Sat Trip Rate	Not updated
Sunday Trip Rate	Sun Trip Rate	Not updated
Res H-W Trip Length	Res H-W Trip Length	Updated
Res H-S Trip Length	Res H-S Trip Length	Updated
Res H-O Trip Length	Res H-O Trip Length	Updated
Non Res H-W Trip Length	-	New
Non Res W-O Trip Length	-	New
Non Res O-O Trip Length	-	New
Weekday Primary Trip	Primary Trip	Updated
Weekday Divert Trip	Divert Trip	Updated
Weekday Pass-By Trip	Pass-By Trip	Updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Saturday Primary Trip	-	New
Saturday Divert Trip	-	New
Saturday Pass-By Trip	-	New
Sunday Primary Trip	-	New
Sunday Divert Trip	-	New
Sunday Pass-By Trip	-	New
Res H-W Trip	Res H-W Trip	Updated
Res H-S Trip	Res H-S Trip	Updated
Res H-O Trip	Res H-O Trip	Updated
Non Res H-W Trip	-	New
Non Res W-O Trip	-	New
Non Res O-O Trip	-	New
-	Non Res C-C Trip Length	Removed
-	Non Res C-W Trip Length	Removed
-	Non Res C-NW Trip Length	Removed
-	Non Res C-C Trip	Removed
-	Non Res C-W Trip	Removed
-	Non Res C-NW Trip	Removed
Vehicle Data - Manual		
All fields	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Fleet Mix		
Land Use Subtype	Land Use SubType	n/a (defined in the Land Use screen)
Season	-	New
LDA through MH	LDA through MH	Updated
Vehicle Emission Factors (formerly Vehicle Emissions – Annual/Summer/Winter)		
Operational Year	-	New
TOG through N ₂ O	TOG through N ₂ O	Updated
Road Dust		
CARB Unmitigated Unpaved Road Statewide Emission Inventory Method	CARB Unmitigated Unpaved Road Statewide Emission Inventory Method	Not updated
% Paved	% Pave	Not updated
Road Silt Loading	Road Silt Loading	Not updated
Material Silt Content	Material Silt Content	Not updated
Material Moisture Content	Material Moisture Content	Not updated
Average Vehicle Weight	Average Vehicle Weight	Not updated
Mean Vehicle Speed	Mean Vehicle Speed	Not updated
Hearths		
Land Use Subtype	Residential Land Use SubType	n/a (defined in the Land Use screen)
# Wood	# Wood	Updated
# Gas	# Gas	Updated
# Propane	# Propane	Updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
# Electric	-	New
# Without Fireplace	# No Fireplace	Updated
Hours/Day	Hours/Day	Updated
Days/Year	Days/Year	Updated
Wood Mass	Wood Mass	Updated
# Conventional	# Conventional	Updated
# Catalytic	# Catalytic	Updated
# Non-Catalytic	# Non-Catalytic	Updated
# Pellet	# Pellet	Updated
Days/Year	Days/Year	Updated
Wood Mass	Wood Mass	Updated
Consumer Products		
General Category Emission Factor	General Category Emission Factor	Not updated
City Park/Golf Course, Pesticides/Fertilizers Emission Factor	City Park/Golf Course, Pesticides/Fertilizers Emission Factor	Updated
Parking Degreaser Emission Factor	Parking Degreaser Emission Factor	Updated
Architectural Coatings		
Reapplication Rate Per Year	Reapplication Rate	Not updated
Residential Interior VOC Content	Residential Interior VOC Emission Factor	Updated
Non Residential Interior VOC Content	Non Residential Interior VOC Emission Factor	Updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Residential Exterior VOC Content	Residential Exterior VOC Emission Factor	Updated
Non Residential Exterior VOC Content	Non Residential Exterior VOC Emission Factor	Updated
Parking Paint VOC Content	Parking VOC Emission Factor	Updated
Residential Interior Coated Area	Residential Interior Square Footage	Not updated
Non Residential Interior Coated Area	Non Residential Interior Square Footage	Not updated
Residential Exterior Coated Area	Residential Exterior Square Footage	Not updated
Non Residential Exterior Coated Area	Non Residential Exterior Square Footage	Not updated
Parking Coated Area	Parking Square Footage	Updated
Landscape Equipment – Default		
Snow Days	Snow Days	Updated
Summer Days	Summer Days	Updated
Landscape Equipment – Manual		
All fields	-	New
Energy Use - Default and Manual		
Land Use Subtype	Land Use SubType	n/a (defined in the Land Use screen)
Total Electricity	-	New
Total Natural Gas	-	New
Title 24 Electricity	-	New
Title 24 Natural Gas	-	New
Non Title 24 Electricity	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Non Title 24 Natural Gas	-	New
-	Title 24 Electricity Energy Intensity	Removed
-	Title 24 Natural Gas Energy Intensity	Removed
-	Lighting Energy Intensity	Removed
-	Non-Title 24 Electricity Energy Intensity	Removed
-	Non-Title 24 Natural Gas Energy Intensity	Removed
Water and Wastewater		
Land Use Subtype	Land Use SubType	n/a (defined in the Land Use screen)
Indoor Water Use	Indoor Water Use	Updated
Include Precipitation	-	New
Outdoor Water use	Outdoor Water use	Updated
Electricity Intensity Factor to Supply	Electricity Intensity Factor to Supply	Updated
Electricity Intensity Factor to Treat	Electricity Intensity Factor to Treat	Updated
Electricity Intensity Factor to Distribute	Electricity Intensity Factor to Distribute	Updated
Electricity Intensity Factor for Wastewater Treatment	Electricity Intensity Factor for Wastewater Treatment	Updated
% of Wastewater Treated by Septic Tank	Septic Tank	Not updated
% of Wastewater Treated by Aerobic	Aerobic	Not updated
% of Wastewater Treated by Facultative Lagoons	Facultative Lagoons	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
% of Wastewater Solids Treated by Anaerobic Digester with Combustion of Digester Gas	Anaerobic Digester with Combustion of Digester Gas	Not updated
% of Wastewater Solids Treated by Anaerobic Digestion with Cogeneration from Combustion of Digester Gas	Anaerobic Digestion with Cogeneration from Combustion of Digester Gas	Not updated
-	Size Metric	Removed
Solid Waste		
Land Use Subtype	Land Use SubType	n/a (defined in the Land Use screen)
Unit	-	New
Size	Size Metric	Not updated
Solid Waste Generation Rate	Solid Waste Generation Rate	Updated
Landfill No Gas Capture	Landfill No Gas Capture	Not updated
Landfill Capture Gas Flare	Landfill Capture Gas Flare	Not updated
Landfill Capture Gas Energy Recovery	Landfill Capture Gas Energy Recovery	Not updated
Refrigerants		
All fields	-	New
Off-Road Equipment		
Equipment Type	Equipment Type	Not updated
Fuel Type	Fuel Type	Updated
Engine Tier	-	New
# per Day	Number of Equipment	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Hours/Day	Hours/Day	Not updated
Days/Year	Days/Year	Not updated
Horsepower	HorsePower (HP)	Updated
Load Factor	Load Factor	Updated
-	Equipment Description	Removed
Off-Road Equipment Emission Factors		
All fields	-	New
Emergency Generators and Fire Pumps		
Equipment Type	Equipment Type	Not updated
Fuel Type	Fuel Type	Updated
# per Day	Number of Equipment	Not updated
Hours/Day	Hours/Day	Not updated
Hours/Year	Hours/Year	Not updated
Horsepower	HorsePower (HP)	Not updated
Load Factor	Load Factor	Not updated
Description	Equipment Description	Not updated
Generators/Pump Emission Factors (formerly Generators / Fire Pumps EF)		
TOG to N ₂ O	TOG to CH ₄	Updated
Process Boilers		
Boiler	Equipment Type	Not updated
Count	Number of Equipment	Not updated

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Fuel Type	Fuel Type	Not updated
Boiler Rating	Boiler Rating	Not updated
Daily Heat Input	Daily Heat Input	Not updated
Annual Heat Input	Annual Heat Input	Not updated
Boilers Emission Factors (formerly Boilers EF)		
TOG to N ₂ O	TOG to CH ₄	Updated
User Defined		
Equipment Type	Equipment Type	Not Updated
Fuel Type(s)	Fuel Type(s)	Not Updated
Emission Factor Pollutants (all)	TOG through CH ₄	Not Updated
Land Use Change		
Soil Carbon Accumulation - Vegetation Land Use Type	Vegetation Land use Type	Updated
Soil Carbon Accumulation - Vegetation Soil	Vegetation Land Use Subtype	Updated
Soil Carbon Accumulation - CO ₂ Accumulation	-	New
Soil Carbon Accumulation - Initial Acres	Initial Acres	Not Updated
Soil Carbon Accumulation - Final Acres	Final Acres	Not Updated
Above and Belowground Biomass Carbon Accumulation - Cover Type	-	New
Above and Belowground Biomass Carbon Accumulation - CO ₂ Accumulation	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Above and Belowground Biomass Carbon Accumulation - Initial Acres	Initial Acres	Not Updated
Above and Belowground Biomass Carbon Accumulation - Final Acres	Final Acres	Not Updated
-	Annual CO ₂ accumulation per acre	Removed
Sequestration		
Operations Lifetime	-	New
Removed Trees - Species	Broad Species Class	Updated
Removed Trees - Number	Number of New Trees	Not Updated
Removed Trees - CO ₂ Avoided through PM2.5 Removed	-	New
Added Trees - Species	Broad Species Class	Updated
Added Trees - Number	Number of New Trees	Not Updated
Added Trees - CO ₂ Avoided through PM2.5 Removed	-	New
-	Annual CO ₂ accumulation per tree	Removed
Climate Risk		
All fields	-	New
Emission Reduction (formerly Mitigation)		
Described below in Table H-3.	Described below in Table H-3.	Described below in Table H-3.
Climate Risk Reduction		
All fields	-	New

CalEEMod Version 2022.1 Data Field or Button	CalEEMod Version 2020.4.0 Data Field or Button	Comparison
Health & Equity		
All fields	-	New
Results		
All fields	-	New
Report (formerly Reporting)		
Summary Report	Summary Report	Updated
Quarterly Report	Embedded in other reports	Updated
Detailed Report	Annual, Summer, and Winter	Updated
Custom Report	-	New
Download PDF	Export PDF	Updated
Download CSV	Export Excel	Updated
Downloaded Excel	Export Excel	Updated
-	Export Word	Removed
-	Recalculate All Emissions and Run Report	n/a (automatic)
Help (from CalEEMod Version 2020.4.0)		
-	Help on the Current Page button	Removed
-	About... button	Removed

- = N/A or not updated

Table H-3. Comparison of Emission Reduction Measures in CalEEMod 2022.1 with Previous CalEEMod (Version 2020.4.0)

CalEEMod Version 2022.1 Measure	CalEEMod Version 2020.4.0 Measure	Comparison
Construction		
C-1-A	C-1	Updated
C-1-B	C-1	Not updated
C-3	-	New measure
C-5	C-1	Updated
C-6	C-1	Not updated
C-7	Unnumbered but named "Oxidation Catalyst (%Reduction)"	Not updated
C-8	-	New measure
C-9	Unnumbered but named "Soil Stabilizer for Unpaved Roads"	Not updated
C-10-A	Unnumbered but named "Water Exposed Surfaces"	Updated
C-10-B	-	New measure
C-10-C	-	New measure
C-11	Unnumbered but named "Unpaved Road Mitigation"	Updated
C-12	Unnumbered but named "Clean Paved Road"	Updated
C-13	-	New measure
-	Unnumbered but named "Replace Ground Cover of Area Disturbed"	Removed measure (wind erosion is not a quantified source)
Transportation		
T-1	LUT-1	Updated
T-2	LUT-3	Updated
T-3	-	New Measure
T-4	LUT-6	Updated
T-5	TRT-1, TRT-2	Updated
T-6	TRT-1, TRT-2	Updated
T-7	TRT-7	Updated

CalEEMod Version 2022.1 Measure	CalEEMod Version 2020.4.0 Measure	Comparison
T-8	TRT-3	Updated
T-9	TRT-4	Updated
T-10	-	New measure
T-12	TRT-14	Updated
T-13	TRT-15	Updated
T-15	PDT-1	Updated
T-16	PDT-2	Updated
T-17	LUT-9	Updated
T-18	SDT-1	Updated
T-19-A	-	New measure
T-19-B	-	New measure
T-20	-	New measure
T-21-A	-	New measure
T-21-B	SDT-3	Updated
T-22-A	-	New measure
T-22-B	-	New measure
T-22-C	-	New measure
T-23	-	New measure
T-24	PDT-3	Updated
T-25	TST-3	Updated
T-27	-	New measure
T-29	TRT-4	Updated
-	TRT-13	Removed (now qualitative or supporting)
-	TRT-6	Removed (now qualitative or supporting)
-	TRT-11	Removed (now qualitative or supporting)
-	LUT-4	Removed (now qualitative or supporting)
-	LUT-5	Removed (now qualitative or supporting)

CalEEMod Version 2022.1 Measure	CalEEMod Version 2020.4.0 Measure	Comparison
-	SDT-2	Removed (now qualitative or supporting)
-	TST-1	Removed (now qualitative or supporting)
-	TST-4	Removed (now qualitative or supporting)
Energy		
E-1	BE-1	Updated
E-2	BE-4	Updated
E-4	-	New measure
E-5	-	New measure
E-6	-	New measure
E-10-A	AE-1, AE-2, AE-3	Updated
E-10-B	AE-1, AE-2, AE-3	Updated
E-10-C	AE-1, AE-2, AE-3	Updated
E-11	-	New measure
E-12-A	-	New measure
E-12-B	-	New measure
E-13	-	New measure
E-15	-	New measure
E-16	-	New measure
E-17	-	New measure
-	LE-1	Removed (now qualitative or supporting)
Water		
W-1	WSW-1	Updated
W-2	WSW-2	Updated
W-3	-	New measure
W-4	WUW-1	Updated
W-5	WUW-3, WUW-4	Updated
W-6	WUW-5	Updated

CalEEMod Version 2022.1 Measure	CalEEMod Version 2020.4.0 Measure	Comparison
W-7	WUW-2	Updated
Waste		
S-1/S-2	SW-1	Not updated
Refrigerants		
R-1	-	New measure
R-2	-	New measure
R-3	-	New measure
R-4	-	New measure
R-5	-	New measure
R-6	-	New measure
Natural Lands		
N-1	-	New measure
N-2	-	New measure
Area Source		
AS-1	Unnumbered but named "Use Low VOC Cleaning Supplies."	Not updated
AS-2	Unnumbered but named "Use Low VOC Paint."	Not updated
E-14	Unnumbered but named "Only Natural Gas Hearth" and "No Hearth."	Updated
LL-1	A-1	Updated
Miscellaneous		
M-1	-	New measure
M-2	-	New measure
M-3	-	New measure

Table H-4. Comparison of User Guides for CalEEMod 2022.1 and CalEEMod Version 2020.4.0

Document	Changes Reflected in the User Guide for CalEEMod Version 2022.1
User Guide	<ol style="list-style-type: none"> 1. The organizational structure of the user’s guide was revised to match and reflect the modules and screens of CalEEMod version 2022.1. 2. Section 1, <i>Introduction</i>, was updated to reflect the expanded purpose and functionalities of CalEEMod. A figure was added to illustrate the architecture of CalEEMod and hierarchy among the sections, modules, screens, and sub-screens 3. Section 2, <i>Accessing CalEEMod</i>, was condensed to explain that installation is no longer relevant to the web-based tool. 4. Edits were made through Section 3, <i>Using CalEEMod</i>, and Section 4, <i>Detailed Program Components, Modules, Submodules, and Screens</i>, to reflect the new features, content, presentation, terminology, and quantification methods for CalEEMod Version 2022.1. This includes addition of the Map component, Climate Risk module, Results component. 5. The section on mitigation measures was updated to provide guidance on using the new Measures module, which includes emission reduction, climate risk reduction, and health and equity measures. 6. A complete references section was added to the user’s guide (see Section 5, <i>References</i>).
Appendix A – Glossary <i>(previously Appendix B)</i>	The appendix has been expanded to include additional terms and concepts relevant to CalEEMod Version 2022.1, including those related to climate change and health and equity.
Appendix B – Acronym List <i>(previously Appendix C)</i>	The appendix has been expanded to define additional acronyms relevant to CalEEMod Version 2022.1, including those related to climate change and health and equity.
Appendix C – Emission Calculation Details for CalEEMod <i>(previously Appendix A)</i>	<ol style="list-style-type: none"> 1. The organizational structure of the appendix was revised to match and reflect the modules and screens of CalEEMod Version 2022.1. 2. Section 1, <i>Overview</i>, was updated to reference additional appendices users should consult for further information related to emission quantification. A figure was also added to illustrate the CalEEMod modules, screens, and sub-screens addressed by the appendix. 3. Edits were made throughout the appendix to reflect the revised methods and data sources for CalEEMod Version 2022.1. Key methodological updates are described in the tables above. 4. New sections were added to address new model content related to emissions quantification. 5. An expanded description and example of how CalEEMod quantifies maximum daily and annual construction emissions has been added to the appendix. 6. Additional information was added for emission reduction measures to describe the revised calculation approach and new feature (e.g., filtering by co-benefits).

Document	Changes Reflected in the User Guide for CalEEMod Version 2022.1
	7. A complete references section was added to the appendix (see Section 8, <i>References</i>).
Appendix D – Technical Source Documentation for Emissions Calculations <i>(previously Appendix E)</i>	Discrete sections of this appendix have been updated, specifically Appendix D4, <i>Degreaser, Fertilizer/Pesticide Use Analysis</i> , and Appendix D5, <i>Analysis of Building Energy Use Data</i> . Appendix D11, <i>Additional Construction Defaults</i> , was added.
Appendix E – Support Documentation for Climate Change Analyses	This is a new appendix that was added to describe the technical method underlying the Climate Risk module and associated risk reduction analyses.
Appendix F – Support Documentation for Health and Equity Association Scoring	This is a new appendix that was added to describe the technical method underlying the health and equity measure prioritization analysis and Health and Equity Evaluation Scorecard .
Appendix G – Default Data Tables <i>(previously Appendix D)</i>	This appendix has been updated to reflect the revised defaults and underlying model assumptions. Additional tables were added for the new climate and health and equity analyses.
Appendix H – Comparison to CalEEMod Version 2020.4.0	This is a new appendix that was added to highlight updates included in CalEEMod Version 2022.1 and the associated User Guide, relative to the prior version (Version 2020.4.0).