



Mobile Source Emissions Inventory -- Categories

This page last updated on May 15, 2015

Category specific emissions estimates have been developed over the past several years in support of specific agency regulatory objectives. Documentation and emissions estimates are available through the regulatory process. This site provides links to available information for each rulemaking.

On-Road Motor Vehicles:

The EMFAC emissions model is developed and used by ARB to assess emissions from on-road vehicles including cars, trucks, and buses in California, and to support ARB's regulatory and air quality planning efforts to meet the Federal Highway Administration's transportation planning requirements. USEPA approves EMFAC for use in State Implementation Plan and transportation conformity analyses. The most recent approved version is EMFAC2011. ARB has recently submitted EMFAC2014 to USEPA for its review. USEPA approval is expected by the end of 2015. USEPA will provide a transition period during which either version may be used. Therefore, in anticipation of USEPA approval, use of EMFAC2014 before the end of the year is appropriate.

Recommended Tools to Use for On-Road Emissions Analyses

Analysis	Recommended Tool
Criteria Pollutant Emissions	EMFAC, EMFAC Web Database
Greenhouse Gas Emissions	Greenhouse Gas Inventory
State Implementation Plans	EMFAC with MPO Activity
Conformity Analyses	EMFAC with MPO Activity
SB375 Analyses	EMFAC with MPO Activity and SB375
CEQA with Localized Data	EMFAC Emission Rates Mode (PL)

EMFAC2011 (USEPA Approved Model)

- [EMFAC2011 Release Document](#)
- EMFAC2011 User's Guides: [LDV](#), [HD](#), [SG](#), [PL](#)
- [EMFAC2011 Technical Documentation](#), [PL Handbook](#)
- EMFAC2011 Software Installation Packages: [LDV](#)(2.6MB), [HD](#)(13.4MB), [SG](#)(1.57GB), [PL](#)(9.4MB)
- [EMFAC2011 Web Database](#)
- [EMFAC2011 Idling Emission Rates](#)
- [More Information on EMFAC2011](#)

EMFAC2014 (Pending USEPA Approval)

ARB has submitted EMFAC2014 to USEPA for approval. It is currently being reviewed by USEPA

staff. As the latest version of the model, EMFAC2014 represents ARB's current understanding of motor vehicle travel activities and their associated emission levels. Compared to previous versions of EMFAC, there has been a variety of changes to the Graphical User Interface and to the overall flow of using EMFAC. As a result, it is strongly recommended that users thoroughly read the User's Guide before installing and running the model. In addition, ARB will be scheduling training webinars that will provide tutorials on how to use EMFAC2014. Please join the [MSEI mailing list](#) if you would like to be informed of the dates and times of future training webinars as well as general developments related to EMFAC2014. For EMFAC2014 related questions please email us at emfac2014@arb.ca.gov.

- [EMFAC2014 Update \(v1.0.7\) Public Release Notice](#)
- [EMFAC2014 User's Guide](#)
- [EMFAC2014 Technical Documentation, PL Handbook](#)
- [EMFAC2014 Software Installation Package \(v1.0.7\) \(480MB\)](#)
- [EMFAC2014 Web Database](#)
- [List of Updates Since v1.0.1](#)
- [Comprehensive Table of EMFAC Topics](#)

Over the past 8 years ARB has also developed emissions inventories for regulatory purposes. Historical documentation and methods are posted below.

On-Road Passenger Cars and Light Trucks:

- Advanced Clean Cars
 - [Rulemaking Page](#)
 - [Inventory Documentation](#)
 - Regulatory Development Background Materials
 - Emissions Inventory - Models
 - ["LEV3 Tool" Corrected](#) - Same as "LEV3 Tool" below, but corrected for a bug in PM30 only
 - ["LEV3 Tool"](#) - Generates statewide baseline and LEV3 emission rates and inventories
 - ["Scaling Tool"](#) - Takes a regional EMFAC run as input and scales the data to the LEV3 tool adjusted baseline
 - [Annual Inventory](#) - Apply LEV3 Reductions to Regional EMFAC Inventory, Annual or Summer Average
 - [Summer Inventory](#) - Apply LEV3 Reductions to Regional EMFAC Inventory, Annual or Summer Average
 - ["CARBITS Tool"](#) - Generates emissions from CARBITS population inputs and LEV3 Tool emission rates
 - [Regional Inventory](#) - Generates regional inventory based on summer or annual inventories referenced above
 - [Model Structure and Inputs](#) - A brief description of the input tables in the models
 - [Model Directions](#) - Directions on how to run the emissions models
 - Emissions Inventory - CARBITS Rebound
 - [Rebound Scenarios](#) - Calculates Change in VMT due to Rebound

Effect

- [CARBITS Populations](#) - Populations from CARBITS for Emission Scenarios
- Emissions Inventory - Tech Group Phase-In
 - [Emission level Splits](#) - The phase-ins for the populations of the scenarios
 - [Emission rate recipes](#) - Emission level instructions and recipes
 - [Emission level Splits/Emission rates](#) - Worksheets for phase-ins and exhaust emission rates
 - [Emission level Splits/Emission rates](#) - Worksheets for phase-ins and evaporative emission rates
 - [PM Exhaust Emission rates](#) - Worksheets and correction factors for Gas Exhaust PM
 - [ZEV Implementation Input](#) - Contains EMFAC 2011 Sales projections and ZEV Implementation facts
 - [LEV 3 Implementation Input](#) - LEV 3 Proposed Compliance Scenario MSCD
 - [LEV 3 Accelerated Scenario](#) - Accelerated Compliance Scenario from MSCD
 - [LD Exhaust Emission Factors from EMFAC 2011](#) - Summer Exhaust Emission factors from EMFAC 2011
 - [Evaporative Emission Factors from EMFAC 2011](#) - Summer Evaporative Emission factors from EMFAC 2011
 - [Gasoline PM exhaust emission factors](#) - Gasoline PM exhaust Emission factors from EMFAC 2011
 - [Methane for NMOG calculation](#)
 - [TOG for NMOG calculation](#)
 - [MDV diesel populations](#) - Correct EMFAC 2011 Output MDV diesel populations
 - [LHD1&2 diesel populations](#) - Correct EMFAC 2011 Output LHD1&2 diesel populations
 - [Tech Group fraction assignments](#) - EMFAC 2011 Tech fraction assignments
 - [Programmed Emission Level Splits EMFAC 2007](#) - Revised EMFAC 2007 LEV 2 baseline
 - [LEV 3 Implementation Original](#) - LEV 2 Actual PZEV sales from Manufacturer Submission
 - [PM Brake wear emission rates](#) - Brakewear PM emissions from EMFAC 2010 LDV source code
 - [PM Tire wear emission rates](#) - Tire wear PM emissions from EMFAC 2010 LDV source code
 - [Survival rates from EMFAC LDV 2010](#) - Survival rates from EMFAC LDV 2010 source code
- Emissions Inventory - Greenhouse Gases
 - [Low Carbon Fuel Standard \(LCFS\)](#) - Percent reduction from LCFS
 - [Proposed LEV III](#) - Percent reduction from federal standard and

proposed LEV III standard

- [Global Warming Potential](#) - Global Warming Potential for 100-yr period

- Clean Cars Standards - Pavley, Assembly Bill 1493
 - [Rulemaking Page](#)
 - [2008 Documentation](#)
 - [2008 Documentation Addendum](#)

- SB375
 - [Program Website](#)
 - [Pavley I + LCFS Post Processor \(Ver 1.0\) Installation](#) (superceded by EMFAC2011-SG; only to be used in conjunction with EMFAC2007)

On-Road Heavy Duty Diesel Trucks:

- Trucks and Bus
 - [2010 Rule Update ISOR Executive Summary](#)
 - [November 2010 Support Data](#)
 - [2010 Documentation \(Appendix G\)](#)
 - [Inventory Database](#)
 - [AB1085 Data Sources](#)
 - [2008 Rule Board Meeting Slides](#)
 - [2008 Rule News Clips](#)
 - [2008 Documentation \(Appendix G\)](#)
 - [Rulemaking Page](#)

- Drayage Truck
 - [2010 Documentation \(Appendix G\)](#)
 - [2007 Documentation \(Appendix B\)](#)
 - [Rulemaking Page](#)

- Public / Utility Fleets
 - [2006 Documentation \(Appendix B\)](#)
 - [Rulemaking Page](#)

- Solid Waste Collection Vehicles
 - [2003 Documentation \(Staff Report - Revised Appendix E\)](#)
 - [2003 Documentation \(Staff Report - Appendix E\)](#)
 - [Rulemaking Page](#)

Off-Road Motor Vehicles:

In the past ARB released the OFFROAD model which calculated emissions from off-road sources. The OFFROAD model is now being replaced by category specific methods and inventory models that

are being developed for specific regulatory support projects. The categories listed below have been or are being updated with new methods and data. Where available, new inventories and models are provided. If a category is not listed below, OFFROAD2007 is the current tool for estimating emissions. It is available [here](#).

Off-Road Diesel Equipment:

- In-Use Off-Road Equipment (Construction, Industrial, Ground Support and Oil Drilling)
 - **NEW** 2011 Inventory Model: [Instruction](#) and [Model](#)
 - Note: This version of the inventory model for In-Use Off-Road Equipment is identical to the one developed for the 2010 amendments but with activity, population, and average horsepower fields in the output.
 - [2010 Documentation \(Appendix D\)](#)
 - 2010 Regulatory Inventory Model: [Instructions](#) and [Model](#)
 - 2010 [AB1085 Support Data](#)
 - [2007 Documentation \(Appendix E\)](#)
 - 2007 [Rulemaking Page](#)
- Cargo Handling Equipment
 - 2011 Inventory Model: [Instructions](#) and [Model](#)
 - [2011 Documentation \(Appendix B\)](#)
 - [2011 Emissions Inventory and Supporting Data](#)
 - [2011 Rulemaking Page](#)
 - [2006 Documentation \(Appendix B\)](#)
 - [Rulemaking Page](#)
- In-Use Mobile Agricultural Equipment
 - Inventory Under Development
 - [Rulemaking Page](#)
- Locomotives
 - [2006 Documentation](#)
 - [1992 Booz Allen Locomotive Inventory](#)
 - [1991 Booz Allen Locomotive Study](#)
 - [Rulemaking Page](#)
- 2011 Transport Refrigeration Unit (TRU) Regulation - Background Materials on Air Emissions
 - [2011 Documentation \(Appendix C\)](#) - included as an appendix to the Staff Report: Initial Statement of Reasons (ISOR)
 - [2011 Emissions Inventory \(zip file\)](#)
 - [2011 Supporting Data \(zip file\)](#)
 - [2011 Documentation \(Appendix C\) References \(zip file\)](#)
 - [2010 Documentation \(Staff Report\)](#)
 - [2003 Documentation \(Appendix D\)](#)
 - [Rulemaking Page](#)

- Commercial Harbor Craft
 - Commercial Harbor Craft Emissions Models (Access Databases)
 - [Instructions](#)
 - [California Harbor Craft Emissions Inventory Database](#)
 - [California Crew and Supply Vessel Emissions Inventory Database](#)
 - [California Barge and Dredge Emissions Inventory Database](#)
 - [2010 Documentation \(Appendix C\)](#)
 - [Revised 2007 Documentation \(Appendix B\)](#)

"This revised copy of the 2007 documentation corrects an engine load factor equation that was mis-typed in the original documentation (page 21). This change does not affect the emissions inventory because the correct equation was used for the emissions estimation."
 - [2007 Documentation \(Appendix B\)](#)
 - [Rulemaking Page](#)
- Ocean Going Vessels
 - [Marine Emissions Model \(Access database\)](#)
 - [Instructions](#)
 - [Definitions](#)
 - [2011 Documentation \(Appendix D\)](#)
 - [2008 Documentation \(Appendix D\)](#)
 - [Rulemaking Page](#)
 - [PM Emission Factor White Paper](#)
- Stationary Commercial Engine
 - [Database Model](#)
 - [Rulemaking Page](#)

Off-Road Gasoline-Fueled Equipment:

- Pleasure Craft
 - [Inventory Under Development](#)
 - [Rulemaking Page](#)
- Recreational Vehicles
 - [Rulemaking Page](#)
 - [Inventory Documentation \(Attachment C\)](#)
 - [RV2013 \(Inventory Model Database\)](#)
 - [RV2013 Support Documents](#)
- Outboard Marine Tank
 - [2008 Documentation \(Staff Report\)](#)
 - [2007 Outboard Marine Tank Survey](#)
 - [Rulemaking Page](#)
- Portable Fuel Tanks
 - [2005 Documentation \(Staff Report\)](#)

- [1999 Documentation \(Staff Report\)](#)
- [Rulemaking Page](#)
- Lawn and Garden
 - [2012 Residential Lawn and Garden Survey](#)
 - [2006 Commercial Lawn and Garden Survey](#)
 - [2001 Residential Lawn and Garden Survey](#)