

# Fleet Emission Management Software



## Fleet Emission Management Software

The Fleet Emission Management Software provides dealers and customers with a clear understanding as to how they will meet the new California off-road emissions regulation, which requires fleets operating in California to lower their average fleet emissions annually. The software develops a low cost path to compliance for the life of the regulation. The software also assists with the look up of technical product information (required by the California regulation) based on machine serial number, as well as creating the files necessary to register fleets with the California Air Resources Board (ARB).



**CATERPILLAR®**

## Annual Compliance From 2010 to 2020

Year	NOx						PM							
	Compliance Method	Target (g/bhp-hr)	Actual (g/bhp-hr)	BACT Required	Actual Turnover (hp)	Credit (hp)	Compliance Method	Target (g/bhp-hr)	Actual (g-bhp-hr)	BACT Required	Actual Retrofit (hp)	Credit (hp)	Total (hp)	No. of Engines
2008	Y (BACT)	NA	NA	NA	NA	NA	Y (BACT)	NA	NA	NA	NA	NA	4181	21
2009	Y (BACT)	NA	NA	NA	NA	NA	Y (BACT)	NA	NA	NA	NA	NA	4181	21
2010	Y (BACT)	6.23	7.92	335	363	28	Y (BACT)	0.26	0.43	836	843	7	4181	21
2011	Y (BACT)	5.83	7.52	335	389	54	Y (BACT)	0.26	0.35	836	840	3	4181	21
2012	Y (BACT)	5.34	7.33	335	348	13	Y (BACT)	0.19	0.27	836	882	46	4181	21
2013	Y (BACT)	4.94	6.61	335	357	23	Y (FLEET AVG)	0.19	0.19	836	311	46	4181	21
2014	Y (BACT)	4.54	5.92	335	419	84	Y (FLEET AVG)	0.13	0.13	836	211	46	4181	21
2015	Y (BACT)	4.14	5.52	335	417	83	Y (FLEET AVG)	0.13	0.09	836	46	46	4181	21
2016	Y (BACT)	3.66	5.38	418	428	10	Y (FLEET AVG)	0.10	0.09	836	46	46	4181	21
2017	Y (BACT)	3.26	5.09	418	443	25	Y (FLEET AVG)	0.10	0.10	836	46	46	4181	21
2018	Y (BACT)	2.86	4.76	418	443	25	Y (BACT)	0.07	0.08	836	860	24	4181	21
2019	Y (BACT)	2.41	4.43	418	430	12	Y (FLEET AVG)	0.07	0.07	836	429	24	4181	21
2020	Y (BACT)	2.01	4.18	418	470	52	Y (BACT)	0.04	0.05	836	906	70	4181	21

**Annual Compliance Report** shows the **year-by-year** changes in your fleet over a specified period, this is a numerical representation of the Emissions Compliance Chart. As machines are added, retired, or replaced, the total machine and hp values are reflected.

**Year:** Lists the year ending on March 1st, starting in 2008.

**Fleet Type:** Lists the size of the fleet according to the regulation. As grow or are reduced, this column will reflect those changes, Small up to 2500 hp, Medium 2501 to 5000, and Large 5001 hp and above.

**Compliance Method:** If your fleet is compliant by way of the BACT method in a given year, then Y (BACT) will appear in this column. If your fleet is compliant by way of the Fleet Average method in a given year, then Y (FLEET AVG) will appear in this column. This can be automatically selected during the optimization or limited to one or the other.

**Target (g/bhp-hr):** Numerical values of the yellow line that appears in the Emission Compliance Chart. For each year, it is the weighted average of each machine's horsepower and the target emissions factor corresponding to that horsepower. The target emissions factors are provided by ARB.

**Actual (g/bhp-hr):** Numeric values of the green/blue/red line that appears in the Emission Compliance Chart – they are the actual values for your fleet. For each year, it is the weighted average of each machine's horsepower and the actual emissions factor corresponding to that horsepower.

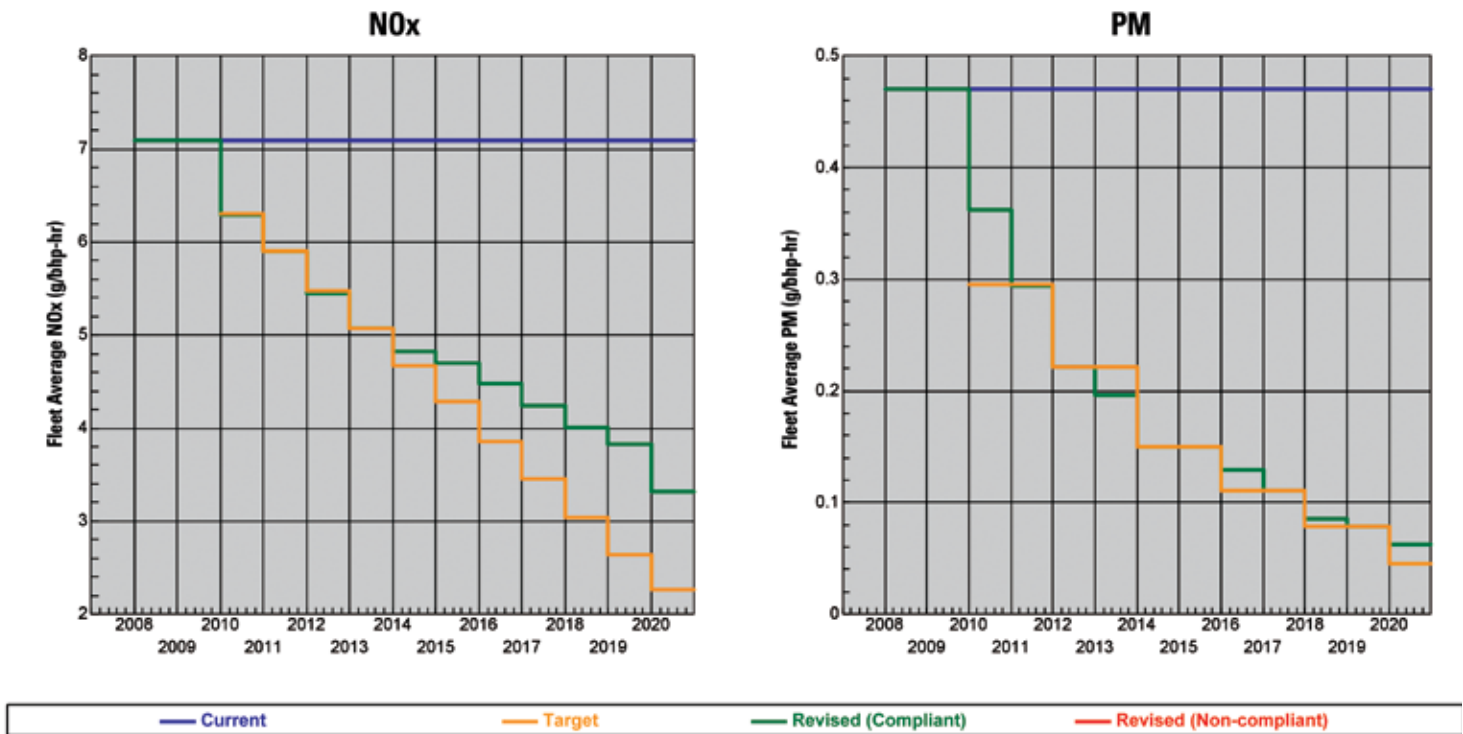
**BACT Required (hp):** For the BACT method, a certain number of horsepower needs to be turned over (NOx) or retrofitted (PM) in order to be compliant. For NOx, between 2010 and 2016 that number is 8% of the fleet's total horsepower. After 2016 it is 10% of the fleet's total horsepower. For PM, that number is 20% of the fleet's total horsepower. This column lists these numbers for each year of the regulation.

**Actual Turnover/Retrofit (hp):** Tracking how much turnover or retrofit you have accomplished in each year. It also adds in how many credits you had left over from the year before.

**Credit (hp):** Tracking how many credits you earn in each year of the regulation. In order to earn credits, you must turn over more horsepower than you are required to. If not used in one year, it rolls over into the next year.

**Total (hp):** The total horsepower of the fleet in the corresponding year. As retirements and added vehicles happen, this column will reflect those changes.

## Emission Compliance Chart – (2010 - 2020)



**Emission Compliance Chart** plots the NOx and PM emission averages of your fleet over the life of the regulation. The left plot is the NOx emissions; the horizontal axis displays the range of years. Each year marks the end of the regulation year, March 1st, ending at 2020 for medium and large fleets and 2025 for small fleets. The vertical axis displays a range for the weighted sum of horsepower and emissions factors, called the fleet average, for NOx in units of g/bhp-hr, or grams of NOx generated for one brake horsepower running for one hour. A 400 hp machine will count twice as much in the fleet average calculation as a 200 hp machine.

The plot on the right is the PM emissions; the vertical axis displays a range for the weighted sum of horsepower and emissions factors, in units of g/bhp-hr.

## Additional Reports

**Proposed Modifications Plan from 2010 to 2020** is a summary report detailing the suggested replacement and or aftertreatment recommended for specific machines to get your fleet into compliance. This is a machine view – rather than a per year view – a complete road map for compliance through the entire regulation. While the tool uses generic pricing to figure out the best path to compliance, this report gives your dealer the option of pricing out the recommended solutions.

**Machine Emissions Contribution – 2010** report shows the “status” of the selected fleet by year. The report lists every machine in your fleet for the selected year, and shows the tier level of each machine in the specified year. The report is a way to see what effect each machine has on your fleets NOx and PM averages by the weighted sum of horsepower and emissions factor, or fleet average, on a per year basis.

# Fleet Emission Management Software

Fleet Emission Management Tool – Features & Benefits	
Features	Benefits
CA regulation ready	<ul style="list-style-type: none"> <li>Developed specifically for the CA off-road diesel regulation</li> <li>Incorporates latest ARB rule changes &amp; interpretations                             <ul style="list-style-type: none"> <li>- Sense of security</li> <li>- Reduces complexity</li> </ul> </li> </ul>
Lowest cost of ownership	<ul style="list-style-type: none"> <li>Cat Compliance plans can provide up to 50% savings over regulation life compared to other compliance plans</li> <li>Software will utilize both BACT and Target compliance strategies based on lowest cost</li> <li>Provides fleet compliance plan over life of regulation</li> </ul>
Flexibility	<ul style="list-style-type: none"> <li>Accepts Cat and non-Cat vehicles</li> <li>Allows for fleet modification as needed</li> <li>Multiple fleet scenario value comparisons</li> </ul>
Ease of registration	<ul style="list-style-type: none"> <li>Confirms compatibility with DOORS</li> <li>Simplifies registration process by providing DOORS compatible files</li> </ul>
Recommended solutions	<ul style="list-style-type: none"> <li>Considers Cat and other industry solutions</li> <li>Automated fleet analysis based on machine value</li> </ul>
Time savings	<ul style="list-style-type: none"> <li>Reduces man hours for data collection &amp; entering                             <ul style="list-style-type: none"> <li>- Pulls available data from multiple databases</li> </ul> </li> <li>Cat developed software combines dealer technical &amp; regulatory expertise with CA regulation</li> </ul>
Comprehensive reports	<ul style="list-style-type: none"> <li>Graphical contrast between optimization result and yearly ARB average fleet emission targets</li> <li>Machine by machine compliance planning</li> <li>Illustrates the machines contributing the most emissions to the fleet</li> </ul>

## CAT® DEALERS DEFINE WORLD-CLASS PRODUCT SUPPORT.

We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investment.

