Category: Industrial

California's industrial off-road emissions inventory is an estimate of the amount and types of pollutants emitted from thousands of pieces of equipment used in industrial applications. These equipment types comprise of 2-stroke and 4-stroke gasoline, diesel engines, and alternative fuels like compress natural gas and liquid propane.

The top 5 most popular equipment types in this category are:

Equipment Type	Fuel Type	2000 Population
Forklifts	C4	79986
Forklifts	G4	43263
Aerial Lifts	D	19411
Other Industrial Equipment	D	15364
Forklifts	D	15320

Emissions Inventory:

As with other OFFROAD equipment types, the emissions inventory for the industrial category is calculated as the product of the emission rate (grams per horsepower-hour), engine population, and activity (hours per year) in annual average use hours.

Calculating Emissions Inventory (PDF Format)

For the current emissions inventory (tons/day):

Air Resources Board Almanac

Input Data Sources:

The input factors used by the OFFROAD Model come from various data sources:

Input Factor	Source of Data (Diesel)	Source of Data (Gas)
Population (base year 2000)	MacKay Survey (2003); Power Systems Research (2005)	Booz-Allen Hamilton/ Industrial Truck Association (1992)
Useful Life	MacKay Survey (2003); ARB (MSCD) Diesel Equipment Survey (2005)	Power Systems Research (1996)
Activity (hr/yr)	ARB (MSCD) Diesel Equip Survey (2005)	Power Systems Research (1996)
Average horsepower	Power Systems Research (1996)	Power Systems Research (1996)
Load factor	Power Systems Research (1996)	Power Systems Research (1996)
Allocation factor	Energy & Environmental Analysis (EEA) (1995)	Energy & Environmental Analysis (EEA) (1995)
Growth factor	DRI/McGraw-Hill employment data (1994)	Cal State Fullerton Study (1994)
Survival rate	Power Systems Research (1996)	Power Systems Research (1996)

For more additional background information on the input factors used by the OFFROAD Model:
(Document Link – Gas) and *(Document Link – Diesel)*

For tables of input data for industrial equipment: *(Document Link)*

Adopted Regulations for Industrial:

2004: (*Reflected in OFFROAD Model*) Board approved amendment to California's existing off-road diesel regulations to harmonize with USEPA Tier 4 regulation (40 CFR 1039). *(Document Link)*

2002: (*Reflected in OFFROAD Model*) EPA regulations on large spark-ignited engines. *(Document Link)*

2000: (*Reflected in OFFROAD Model*) Board approved the emissions inventory for off-road large CI engines (>=25hp) from the OFFROAD Model. *(Document Link)*

1998: (*Reflected in OFFROAD Model*) Board approved the off-road large spark-ignited engines (>=25hp) regulations. *(Document Link)*

1998: (*Reflected in OFFROAD Model*) Board approved the emissions inventory for off-road large spark-ignited engines (>=25hp) from the OFFROAD Model. *(Document Link)*

Future Improvements to the Industrial Category:

The emissions inventory from the OFFROAD Model strives to accurately represent the 'real-world' as accurately as possible. Therefore, the methodologies and data sources are constantly re-evaluated and updated where applicable. The following items are future improvements for the industrial category:

- Update population and activity values as new data becomes available
- Revise growth factors using REMI employment data (2001)
- Allocate equipment from the county down to the neighborhood level (GIS)