C-2. Limit Heavy-Duty Diesel Vehicle Idling

GHG Mitigation Potential

Potentially small reduction in GHG emissions from construction vehicles

Co-Benefits (icon key on pg. 34)

Climate Resilience

Limiting vehicle idling saves fuels and can reduce sensitivity to price shocks or fuel scarcity.

Health and Equity Considerations

This measure will not only reduce air pollution for surrounding communities but also for onsite workers.

Measure Description

This measure limits heavy-duty vehicle idling beyond current regulatory restrictions. The Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling prohibits diesel-fueled commercial motor vehicles of more than 10,000 pounds from idling the vehicle's primary engine for 5 minutes at a single location (13 CCR Section 2485). There are some exceptions to the regulation, such as positioning or providing a power source for equipment or operations, such as lift, crane, pump, drill, hoist, or other auxiliary equipment. Reduction in idling time beyond the regulation would further reduce fuel consumption and thus emissions. Reducing idling benefits the health of construction workers as well as nearby residents and workers.

Scale of Application

Project/Site and Plan/Community

Implementation Requirements

The construction site manager should develop an enforceable mechanism that monitors the idling time to ensure compliance with this measure. Note that while this measure discusses heavy-duty vehicles used for construction, this measure can also be implemented for other vehicle applications (e.g., agriculture, industrial).

Cost Considerations

There are no initial costs associated with this measure. Restricting vehicle idling time beyond regulation will reduce fuel consumption, leading to long-term cost savings.

Expanded Mitigation Options

Pair with Measure T-30, *Use Cleaner-Fuel Vehicles,* to reduce the carbon intensity of fuels combusted during idling.

GHG Reduction Formula

$$A = (B - D) \times C \times E \times F \times G \times H$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	GHG reduction from idling limit	[ ]	MT CO_2e	calculated
User Inputs				
B	Idle restriction with measure implementation	[ ]	minutes/period	user input
C	Vehicle trips	[ ]	trips	user input
Constants, Assumptions, and Available Defaults				
D	Idle limit without the measure	5	minutes/period	13 CCR Section 2485
E	Idle periods per trip	2	period/trip	assumption
F	Vehicle idling emission factor	[ ]	g/idle hours	CARB 2021
G	Conversion from minutes to hour	0.0167	hours per minute	conversion
H	Conversion from g to MT	1 e^{-6}	MT per g	conversion

Further explanation of key variables:

- (A) – Emissions reductions are quantified per vehicle idling period. Daily emissions reductions can be quantified if the number of idling periods per day is known.
- (B) – The measure-imposed idle restriction must exceed the idle limit without the measure (D).
- (C) – Idle restrictions are imposed on vehicles idling at a single location. Vehicles may make multiple trips to that location or make trips to different locations but still be subject to the idling limit. Users should define the number of trips the vehicle will make for the analysis period (e.g., per day, per year).
- (D) – The Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling limits diesel-fueled commercial motor vehicle idling time to 5 minutes at a single location, with exceptions for some vehicles with auxiliary equipment powered by the primary engine. The user should determine the appropriate idling limit without the measure for such exempted vehicles.
- (E) – The quantification method assumes the vehicle will idle twice per trip at a single location: once during vehicle shutdown from the inbound trip and once during vehicle warmup for the outbound trip. Users should apply a different factor if the number of idle periods per trip is known.
- (F) – GHG intensity factors for diesel-fueled heavy vehicle idling can be obtained from CARB's (2021) EMFAC model.

GHG Calculation Caps or Maximums

None.

Example GHG Reduction Quantification

The user reduces vehicle idling emissions by enforcing an idling period of 3 minutes (B). In this example, a heavy-duty truck is regulated under the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. The idling limit without the measure is therefore 5 minutes at a single location (D). The vehicle has a gross vehicle weight of 35,000 pounds and will operate at a construction site in Los Angeles County in 2023. The vehicle will make 10 trips to the construction site per day (C). The idling carbon intensity is 6,375 g CO_2e per idle hour (F).

$$A = \left(3 \frac{\text{idle min}}{\text{period}} - 5 \frac{\text{idle min}}{\text{period}}\right) \times 10 \frac{\text{trips}}{\text{day}} \times 2 \frac{\text{period}}{\text{trip}} \times 6{,}375 \frac{\text{g}}{\text{idle·hr}}$$

$$\times 0.0167 \frac{\text{hr}}{\text{min}} \times 1e^{-6} \frac{\text{MT}}{\text{g}} = <\text{-}0.1 \frac{\text{MT } CO_2e}{\text{day}}$$

Quantified Co-Benefits

Improved Air Quality

Reducing fossil-fuel combustion from idling restrictions will also reduce local criteria pollutants. The reduction in criteria pollutant emissions can be calculated using the GHG reduction formula, where (F) represents the criteria pollutant intensity factors obtained from CARB's (2021) EMFAC model.

Sources

- California Air Resources Board (CARB). 2021. *EMFAC*. Available: https://arb.ca.gov/emfac/. Accessed: September 2021.