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Real-world exhaust emissions and fuel consumption for diesel vehicles fueled by waste cooking oil biodiesel blends

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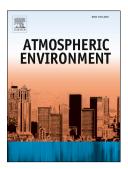
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### Real-world exhaust emissions and fuel consumption for diesel

## vehicles fueled by waste cooking oil biodiesel blends

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#### 9 Abstract

The real-world exhaust emissions and fuel consumption of on-road diesel vehicles, 10 fueled by waste cooking oil biodiesel blends, were measured using a portable 11 emission measurement system (PEMS). Two light-duty diesel trucks (LDDTs) and 12 two heavy-duty diesel trucks (HDDTs) filled with four mixed fuels with blend ratios 13 of 0% (neat diesel), 5% (B5), 20% (B20), and 100% (B100) (biodiesel in traditional 14 15 fossil diesel) were tested. The results show that the total fuel consumption (biodiesel + traditional fossil diesel) did not clearly decrease, but blending biodiesel into 16 traditional fossil diesel could clearly decreased the consumption of traditional fossil 17 diesel, reduce the countries' dependence on oil imports. Converting waste cooking oil 18 into biofuel and blending with diesel is a three-win alternative, dealing simultaneously 19 with greenhouse gas (GHG) emission, food security, and energy security. The CO, HC, 20 NO<sub>X</sub> and PM<sub>2.5</sub> emissions for all of the tested vehicles decreased with increasing 21 biodiesel content in the blend, with the exception of  $PM_{2.5}$  and  $NO_X$  for D3, the  $NO_X$ 22 emissions showed a decrease with increasing biodiesel content in the blend for most 23

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