

## Environmental Research, Technology Demonstration and Conference Project

<b>ECF Project:</b>	ECF 2018-19
<b>Project Title:</b>	Investigation of on-road diesel vehicle fleet emissions to evaluate emission control policy effectiveness and their impact on hotspot air quality
<b>Principal Investigator:</b>	Dr Ning Zhi, Division of Environment and Sustainability, The Hong Kong University of Science and Technology
<b>Total Approved Grant:</b>	\$1,680,000
<b>Duration:</b>	1/6/2019 to 31/5/2021
<b>Project Status/Remarks:</b>	Completed
<b>Project Scope:</b>	<p>The project aims to apply advanced pollutant assessment techniques to answer important questions about the nature and magnitude of emissions from heavy duty diesel traffic and their impacts on roadway hotspots air quality in Hong Kong. These emissions have been shown to play an important role in the city and despite considerable efforts to control them they remain key sources of harmful nitrogen dioxide and particulate matter (PM). Specific objectives include –</p> <p>(a). to improve the mobile vehicle plume chasing system and compare with the traditional Portable Emission Measurement System (PEMS) for applicability evaluation;</p> <p>(b). to carry out chasing measurement of NO<sub>x</sub> and PM emissions from on-road diesel fleets and provide evidence of the primary emission reduction since the diesel commercial vehicle programme and the selective catalytic reduction retrofit; and</p> <p>(c). to evaluate if the street canyon affects the primary emission dispersion and roadway hotspots air quality.</p>
<b>Summary of the Findings/Outcomes:</b>	<p>With environmental and public health as the main motivation, the Hong Kong Government has continuously developed methods for tracking and phasing out high-emission vehicles. With the persistent non-compliance of roadside air monitoring stations, there is a need to inspect the fleet emissions after the implementation of these programs to assess control efficacy and to determine areas where more efforts are needed.</p> <p>The project has shown the possibility of using a plume chasing device as a screening tool to detect high emitters during driving. During the project report period, a total of 1104 vehicles were sampled with the OPCAS-II system, of which 1004 were valid and have been used in the calculation of emission factors.</p> <p>Compared to the project team’s previous study, the BC, PM<sub>2.5</sub> and NO<sub>x</sub> emissions of Diesel commercial vehicles (DCVs) have been noticeable decreased, which is due to the systematic vehicle emission control policies</p>

	<p>in recent years and the effective evaluation of their implementation. High-emission vehicles remain a major contributor to air pollution, only about 20% of the dirtiest vehicles disproportionately contributed to 50% of the total pollutant emissions. Obviously, priority must be given to diesel commercial vehicles, franchised buses and inadequately - maintained diesel vehicles in the future.</p>
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