

Pilot Green Transport Fund

Final Report

On

Trial of Hybrid Light Goods Vehicle for

Courier Services (R&B Express)

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The Monitoring and Evaluation Team's views expressed in this report do not necessarily reflect the views of the Environmental Protection Department, HKSAR.

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(Trial Period: 1 August 2017 – 31 July 2019)

Executive Summary

1. Introduction

1.1 The Pilot Green Transport Fund (the Fund) is set up to encourage transport operators to try out green innovative transport technologies, contributing to better air quality and public health for Hong Kong. The Fund has subsidized R&B Express Co. (R&B Express) to try out one hybrid light goods vehicle (HV) for courier services.

1.2 PolyU Technology and Consultancy Company Limited (the assessor) has been engaged by the Environmental Protection Department (EPD) as an independent third party assessor to monitor the trials and evaluate the performance of the trial vehicles. The assessor regularly visited R&B Express to collect information for evaluating the performance of the HV as compared with the diesel light goods vehicle (DV) which provided the same service in the same area and road conditions. The information collected included the said vehicles' operation data, fuel bills, maintenance records, reports on operation difficulties, and opinion of the HV driver from survey questionnaires.

1.3 This Final Report summarizes the performance of the HV in the 24-month trial as compared with its conventional counterpart, i.e. the DV.

2. Trial Vehicles

2.1 R&B Express procured one MITSUBISHI FUSO HV of 5,500 kg gross vehicle weight (GVW) and 2,998 cc cylinder capacity for trial. One MITSUBISHI FUSO DV of 5,500 kg GVW and 4,899 cc cylinder capacity was assigned for comparison with the HV. All vehicles were used for courier services and were equipped with air-conditioning units.

2.2 Key features and photos of the HV and DV are in Appendix 1 and Appendix 2 respectively.

3. Trial Information

3.1 The trial started on 1 August 2017 and lasted for 24 months. Both the HV and the DV operated from Shum Shui Po depot to deliver freights to Hong Kong Island East and Aberdeen areas. There was no fixed route. The HV provided service every day from 08:30 to 19:30 daily with lunch hour break from 13:00 to 15:00 except Sunday and public holidays while the DV provided services from 19:00 to 23:00 Wednesday to Friday.

4. Findings of Trial

4.1 Table 1 shows a summary of the all key statistics for each vehicle.

Table 1: Summary of all the costs of each vehicle

	HV	DV
Total distance travelled (km)	60,347	16,823
Fuel cost (HK\$) ^[1]	155,050	47,151
Average fuel economy (km/litre)	5.25	4.75
Average fuel cost (HK\$/km)	2.569	2.803
Maintenance cost (HK\$) ^{[2] [3]}	2,105	9,540
Other cost (HK\$)	0	0
Total operating cost (HK\$)	157,155	56,691
Average total operating cost (HK\$/km)	2.61	3.37
Downtime (working day) ^[4]	0.5	0.5

^[1] The market fuel price was used for calculation.

^[2] The HV was under warranty, the labour cost was waived and only the parts to be replaced were charged.

^[3] Maintenance due to incident not related to the performance of the vehicle was not included for comparing the performance.

^[4] Downtime refers to working days that the vehicle was not in operation, which counted from the first day it stopped operation till the day it was returned to the operator.

4.2 The average fuel cost of HV was lower than that of DV by 8.3%. while the average total operating cost of the HV was 22.7% lower than that of the DV.

4.3 During the 24-months trial period, the HV had one scheduled and no unscheduled maintenance. The DV had two scheduled maintenances and one unscheduled maintenances. Out of the 593 and 302 working days for HV and DV respectively in the trial, there were 0.5 days of downtime for the HV and 0.5 days for the DV, excluding those downtime unrelated to the vehicle performance. The utilization rate was 99% for both the HV and the DV.

4.4 To remove the effect of seasonal fluctuations, 12-month moving averages are used to evaluate the trend of the HV's fuel economy. The results show that the fuel economy of the HV fluctuated slightly over the 24-month trial period. The fuel economy of the HV appears to stay at a steady level. There is no indication of deterioration in fuel economy of the HV.

4.5 The carbon dioxide equivalent (CO₂e) emission from the HV was 31,886 kg while that from DV on HV mileage was 35,256 kg. Overall, there was a total reduction of 3,370 kg CO₂e emission (i.e., around 9.6%) in the trial by using the HV.

5. Summary

5.1 In the 24-month trial period, the average daily mileage of HV was 102 km while that of the DV was 56 km. The mileages of the HV is much higher than the DV. The HV had a better fuel economy than the DV. The average fuel cost of the HV was lower than that of the DV by about 8.3%. Including the maintenance costs, the average total operating cost of the HV was 22.7% lower than that of the DV. The utilization rate was 99% for both the HV and the DV.

5.2 R&B Express assigned a driver for the HV. The driver of the HV had no problem in operating the vehicles, except that the HV responded slower than the DV and had less powerful than the DV, especially when driving upslope. He opined that the HV served well the daily operation and there was no deterioration of mileage for each refuel of HV.

5.3 R&B Express was generally satisfied with the HV but had no plan to replace the entire vehicle fleet with hybrid vehicles.

5.4 There was a total of 3,370 kg CO₂e reduction (i.e., 9.6%) by using the HV during the 24-month trial period.

5.5 No deterioration in the performance of the HV was observed during the trial period.

Appendix 1: Key Features of Vehicles

1. Trial HV

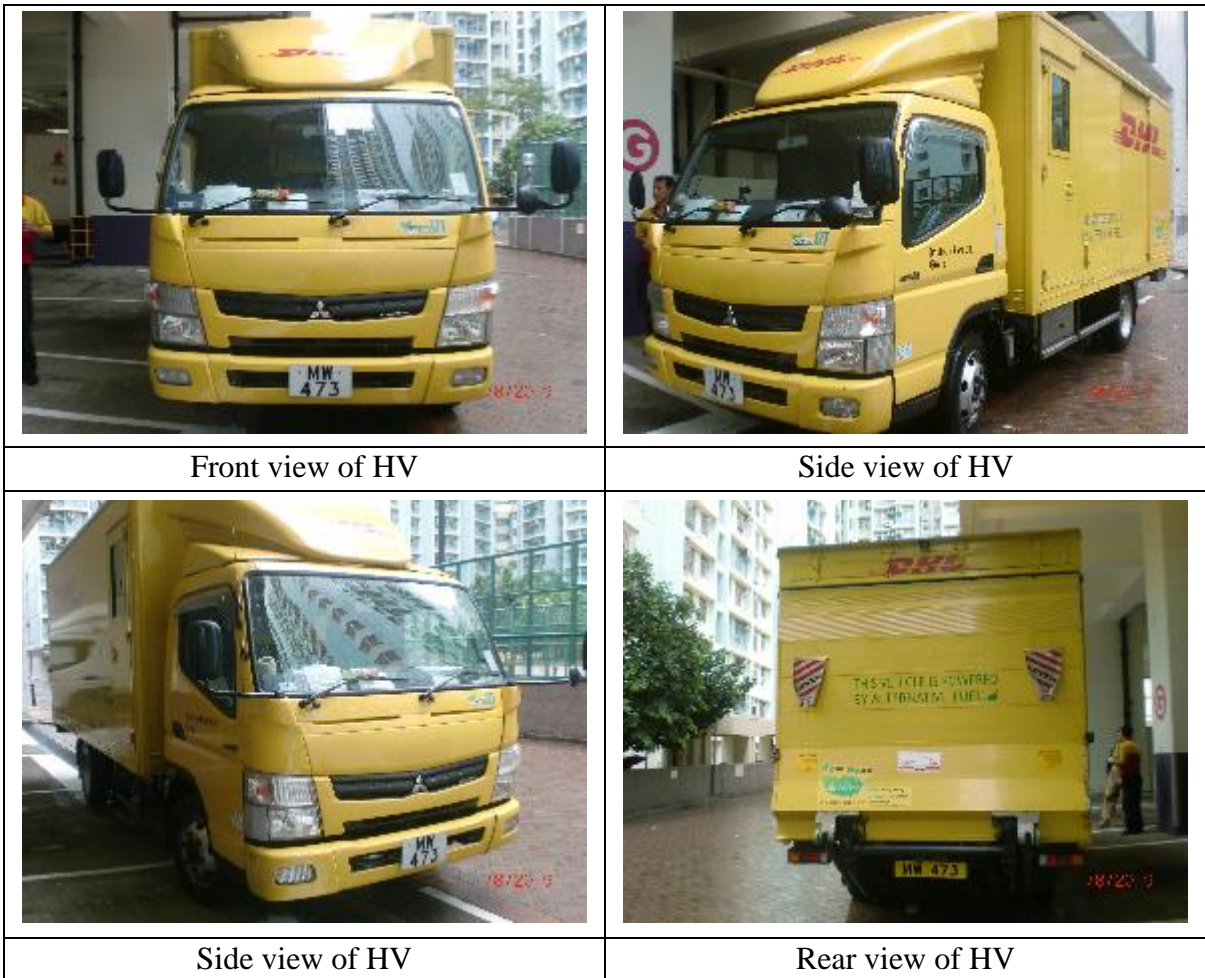
Registration Mark:	MW473 (HV)
Make:	MITSUBISHI FUSO
Model:	FEB74ER3SDAL
Class:	Light goods vehicle
Gross vehicle weight:	5500 kg
Seating Capacity:	6 (including driver)
Cylinder capacity:	2998 cc
Year of manufacture:	2017

2. DV used for comparison

Registration Mark:	HR6178 (DV)
Make:	MITSUBISHI FUSO
Model:	FE83DEZSRDAA
Class:	Light goods vehicle
Gross vehicle weight:	5500 kg
Seating Capacity:	3 (including driver)
Cylinder capacity:	4899 cc
Year of manufacture:	2010

Appendix 2: Photos of the Trial Vehicles

1. Trial HV- MW473



2. DV used for comparison - HR6178

