Pilot Green Transport Fund

Interim Report On
Trial of Hybrid Light Goods Vehicle for Moving Service (K. C. Dat)

(11 July 2017)

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Interim Report
(Trial Period: 1 December 2015 – 30 November 2016)

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 (the green innovative technology), contributing to better air quality and public health for Hong Kong. K. C. Dat Limited (K. C. Dat) was approved under the Fund for trial of one hybrid light goods vehicle for moving service.

1.2 Hong Kong Institute of Vocational Education (Tsing Yi) has been engaged by the Environmental Protection Department as an independent third party assessor to monitor the trial and evaluate the performance of the trial vehicles.

1.3 This Interim Report summarizes the performance of the HV in the first twelve months of the trial as compared with its conventional diesel counterpart.

2. Trial Vehicles

2.1 Through the tendering procedures stipulated in the Agreement, K. C. Dat procured one Mitsubishi Fuso Canter Eco Hybrid 5.5t (HV) for trial. One diesel light goods vehicle (DV) providing similar services was assigned as the conventional vehicle for comparing with the HV.

2.2 Key features of the HV and the DV are in Appendix 1 and photos of the vehicles are in Appendix 2. The vehicle was used for transporting furniture and bulky materials for the clients.

3. Trial Information

3.1 The trial started on 1 December 2015 and would last for 24 months. K. C. Dat was required to collect and provide trial information including the HV odometer reading, the date of refueling, the refueled amount, cost and operation downtime associated with scheduled and unscheduled maintenance of the HV. Similar data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers were also collected to reflect any problems of the HV.

3.2 The following table summarizes the statistical data of the HV and the DV. The average fuel cost of the HV was $0.62/km (25.5%) lower than the DV and the average total operating cost of the HV was $0.61/km (25.1%) lower than the DV.

Table 1: Key Operation Statistics of Each Vehicle (December 2015 to November 2016)

		HV	**DV**
Total mileage	(km)	22,412	18,649
Average fuel economy	(km/litre)	5.90	4.39
Average fuel cost ($/km) [1]		1.81	2.43
Average total operating cost/ ($/km) [2,3]		1.82	2.43
Downtime/ working day [4]		16	4

[1] Market rate was adopted for calculation.

[2] Maintenance due to incidents unrelated to the performance of the vehicle was not included for comparison.

[3] Market rate on diesel exhaust fluid (Adblue) was adopted for calculation.

[4] Downtime refers to the equivalent number of working days in which the vehicle was not in operation due to maintenance, counting from the first day it stopped operation till the day it was returned to the operator. For incidents with operation downtime less than 1 hour, the no. of working days for the vehicle out of service would be counted as 0.

3.3 Apart from the maintenance cost, other indirect costs might include towing fee, the cost of diesel exhaust fluid (Adblue), vehicle replacement fee and cost of operation downtime due to maintenance of the HV. Since there is a selective catalytic reduction (SCR) system in the HV, it is required to refill the Adblue fluid each month for reducing the emission level of NOx gas while there was no such need for DV.

3.4 The DV had 4 days of operation downtime and the HV had 16 days of operation downtime in this reporting period. Utilization rate of HV and DV was 94.6% and 98.7% respectively.

4. Summary

4.1 The average fuel cost of the HV is $0.62/km (25.5%) lower than the DV and the average total operating cost of the HV is $0.61/km (25.1%) lower than the DV. Utilization rates of HV and DV were 94.6% and 98.7% respectively.

4.2 The engine fitted in the HV has a capacity that is 25% smaller than that of the DV. It is coupled with an integrated electric drive transmission to optimize use of battery/electrical power, and powers directly from the diesel engine. This combination allows fuel consumption savings under the same operating conditions as the DV.

4.3 According to K. C. Dat, the HV was recalled for changing parts in late-November 2016. After the maintenance work was completed, it was discovered that there was a coolant leaking problem with the vehicle. There was no sign of leakage before the recall.

4.4 The driver expressed the view that the driving habits would be one of the factors which needed to be overcome when operating the HV. He felt that the HV was lack of power while climbing uphill with full load, he feared that might be a serious hazard if the vehicle was stalled. Slow response time of gear shifting for the HV would also bring about the risk of traffic accident if the vehicle could not cut the lanes with a sufficient speed.

4.5 The findings only reflect the performance of the HV in the first twelve months of the trial. More time is needed to test the performance and reliability of the HV.

Appendix 1: Key Features of Vehicles

1. Trial HV

Registration Mark	**TS9571**
Make:	Mitsubishi Fuso
Model:	FEB74GR3SDAL
Class:	Light Goods Vehicle
Gross vehicle weight:	5.5 tonnes
Seating capacity:	Driver + 5 passengers
Engine capacity:	2,998 c.c.
Maximum Output(ps/rpm):	150/3500
Battery Type:	Lithium ion
Year of manufacture:	2014

2. DV for comparison

Registration Mark	**TL3055**
Make:	HINO
Model:	300 Series XZU720R-HKTQS3
Class:	Light goods vehicle
Seating capacity:	Driver + 2 passengers
Gross vehicle weight:	5.5 tonnes
Engine capacity:	4,009 c.c.
Year of manufacture:	2015

Appendix 2: Photos of Vehicles

1. HV

	
Front view of HV	Rear view of HV
	
Left side view of HV	Right side view of HV

2. DV

	
Front view of DV	Rear view of DV
	
Left side view of DV	Right side view of DV