Pilot Green Transport Fund

Interim Report On
Trial of Hybrid Medium Goods Vehicle For Chemical Waste Collection (Ecospace)

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Pilot Green Transport Fund
Trial of Hybrid Medium Goods Vehicle for Chemical Waste Collection
(Ecospace)

Interim Report
(Trial Period: 1 August 2015 – 31 January 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 and innovative transport technologies, contributing to better air quality and public health for Hong Kong. Ecospace Limited (Ecospace) was approved under the Fund for trial of one hybrid medium goods vehicle for chemical waste collection.

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 six months of the trial as compared with its conventional diesel counterpart.

2. Trial Vehicles

2.1 Through the tendering procedures stipulated in the Agreement, Ecospace procured one Hino 300 Series 8.2 Tonnes Hybrid Medium Good Vehicle (HV) for trial. One diesel medium 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 vehicles were used for chemical waste collection in all areas of Hong Kong.

3. Trial Information

3.1 The trial started on 1 August 2015 and will last for 24 months. Ecospace is required to collect and provide trial information 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 is 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 is $0.22/km (9.6%) lower than the DV and the operating cost of the HV is $0.15/km (6.4%) lower than the DV.

Table 1: Key Operation Statistics of Each Vehicle (August 2015 to January 2016)

		HV	**DV**
Total mileage	(km)	3,728	5,877
Average fuel economy	(km/litre)	5.06	4.59
Average fuel cost ($/km) [1]		2.07	2.29
Average total operating cost ($/km) [2]		2.21	2.36
Downtime/ working day [3,4]		2	1

[1] Market fuel price was used for calculation.

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

[3] Downtime refers to the equivalent number of working days in which the vehicle is not in operation due to maintenance, counting from the first day it stops operation till the day it is returned to the operator.

[4] 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 According to the manufacturer's information, the trial vehicle model could save about 14% fuel as compared with its diesel counterpart according to the calculation method approved by the Ministry of Land, Infrastructure, Transport and Tourism of Japan. Fuel economy depends on road condition. If it travels more in suburban areas or on highways, there would be less fuel saving because the energy recovered by the electric generator at start-stops is much reduced. The HV and DV travelled partly in suburban and highways, and hence it was anticipated that they were unable to achieve the best fuel saving performance according to the manufacturer because of less start-stops to recover the energy by the electric generator as compared to traveling in urban areas.

3.4 Apart from the maintenance cost, other indirect costs might include towing fee, vehicle replacement fee and cost of operation downtime due to maintenance of the HV. During the reporting period, no other indirect costs were found in the calculation of total operating cost for these vehicles.

3.5 The utilization rate of HV and DV was 98.7% and 99.3% respectively.

4. Summary

4.1 The average fuel cost of the HV is $0.22/km (9.6%) lower than the DV and the operating cost of the HV is $0.15/km (6.4%) lower than the DV. The utilization rate of HV and DV was 98.7% and 99.3% respectively.

4.2 In general, Ecospace expresses satisfaction with the overall performance of the HV since it could bring about significant benefit through saving the fuel cost in the long run.

4.3 The majority of HV drivers had negative opinions on the vehicle as reflected in the driver's questionnaires. As compared to conventional vehicles, the drivers felt difficult to operate the HV. They did not prefer to use the HV and were not satisfied with the acceleration and the throttle response time of the HV. The HV was not as powerful as the conventional ones at slope climbing. According to the supplier, this is because the processor in the HV at the ECO driving mode controls the optimum power output in order to achieve higher fuel efficiency, and in turn giving a feeling to driver that the vehicle is less powerful.

4.4 The findings only reflect the performance of the HV in the first six months of the trial. More time is needed to test the fuel saving performance and the reliability of the HV.

Appendix 1: Key Features of Vehicles Involved in the Trial

1. Trial HV

Registration Mark	**TL3329**
Make:	HINO
Model:	300 Series Hybrid XKU730R-HKUTS3
Class:	Medium Goods Vehicle
Gross vehicle weight:	8.2 tonnes
Seating capacity:	Driver + 2 passengers
Year of manufacture:	2015
Cylinder Capacity:	4,009 c.c.

2. DV used for comparison

Registration Mark	**SB8248**
Make:	HINO
Model:	300 Series
Class:	Medium Goods Vehicle
Seating capacity:	Driver + 2 passengers
Gross vehicle weight:	8.5 tonnes
Year of manufacture:	2013
Cylinder Capacity:	4,009 c.c.

Appendix 2: Photos of Vehicles

1. Trial HV

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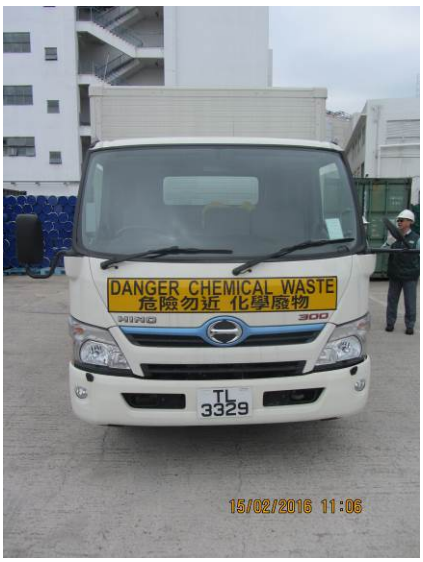
<tr><td> 
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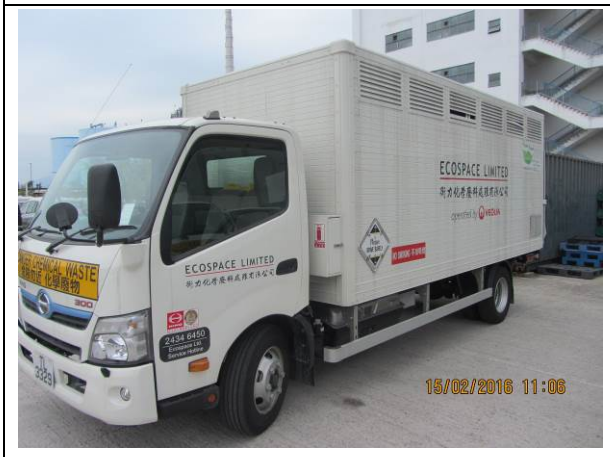
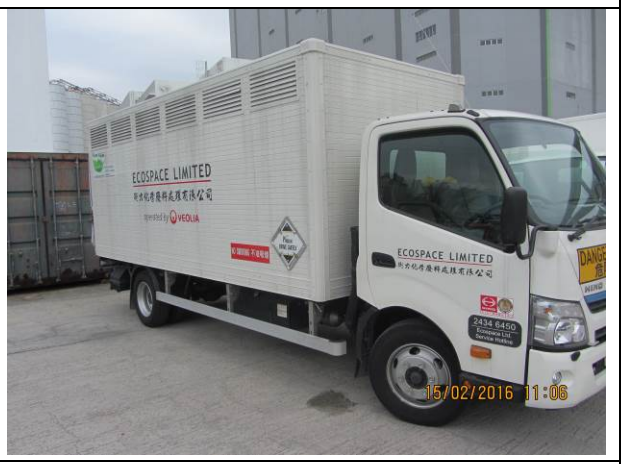
<tr><td>Front view of HV</td><td>Rear view of HV</td></tr>
<tr><td> 
</td><td> 
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<tr><td>Left side view of HV</td><td>Right side view of HV</td></tr>
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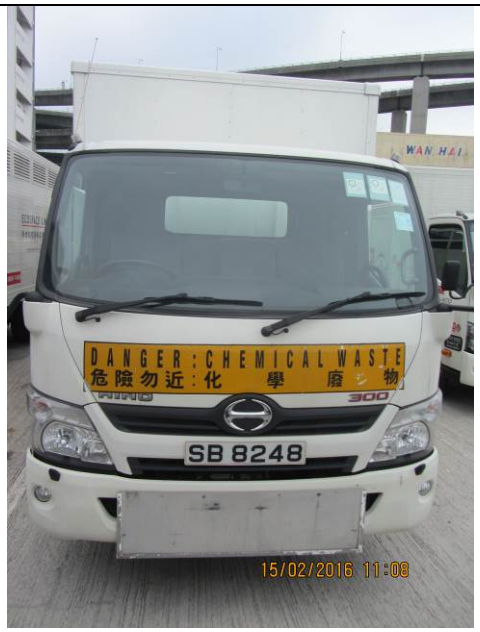
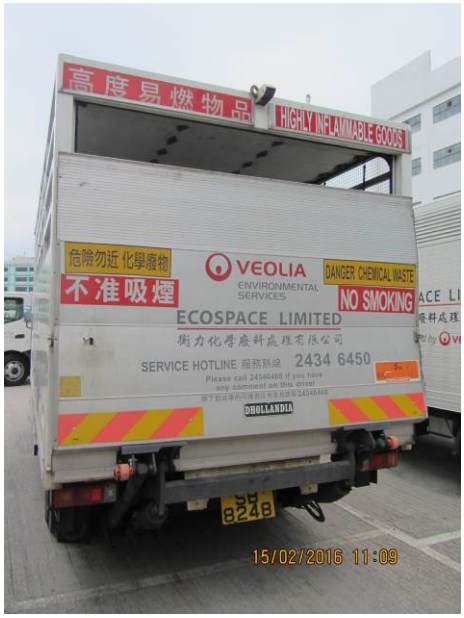
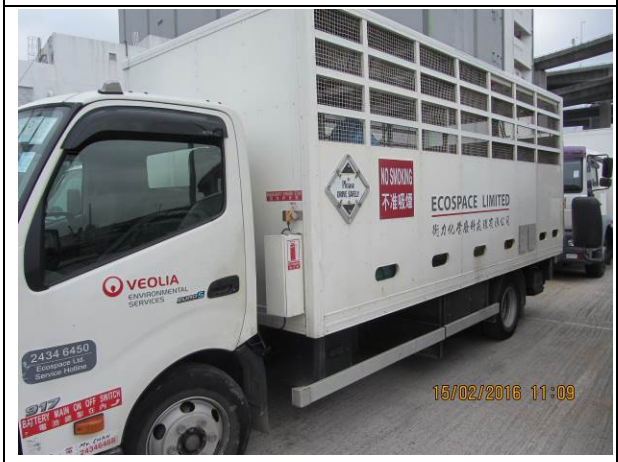
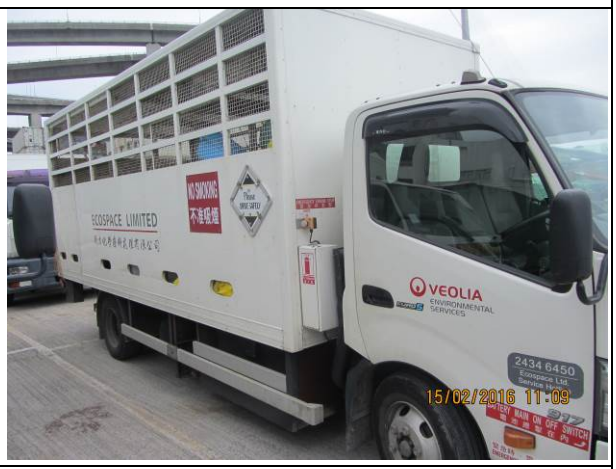
2. DV for Comparison

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