

**Pilot Green Transport Fund**

**Interim Report On**  
**Trial of Hybrid Light Goods Vehicle**  
**for Chemical Waste Collection**  
**(Ecospace)**

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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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**Pilot Green Transport Fund**  
**Trial of Hybrid Light 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 light 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 5.5 Tonnes Hybrid Light Good Vehicle (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 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 \$0.29/km (12.8%) lower than the DV and the operating cost of the HV is \$0.34/km (13.8%) lower than the DV.

Table 1: Key operation statistics of each vehicle (August 2015 to January 2016)

		HV	DV
Total mileage	(km)	4,667	3,554
Average fuel economy	(km/litre)	5.32	4.66
Average fuel cost (\$/km) <sup>[1]</sup>		1.98	2.27
Average total operating cost (\$/km) <sup>[2]</sup>		2.12	2.46
Downtime (working day) <sup>[3]</sup>		1	8

<sup>[1]</sup> Market fuel price was used for calculation.

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

<sup>[3]</sup> 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.

3.3 According to the manufacturer's information, the trial vehicle model could save about 15% 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 99.3% and 94.7% respectively.

## 4. Summary

4.1 The average fuel cost of the HV is \$0.29/km (12.8%) lower than the DV and the operating cost of the HV is \$0.34/km (13.8%) lower than the DV. The utilization rate of EV and DV was 99.3% and 94.7% respectively.

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

4.3 The drivers opined there were no distinctive advantages on the HV. The drivers had to take time for adapting the HV operation at the beginning of the trial. Also, the HV was not as powerful as the conventional ones at slope climbing. They were also unsatisfied with the acceleration and the throttle response time of the HV. 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**

<b>Registration Mark</b>	<b>TL3950</b>
Make:	HINO
Model:	300 Series Hybrid XKU710R-HKUQS3
Class:	Light Goods Vehicle
Gross vehicle weight:	5.5 tonnes
Seating capacity:	Driver + 2 passengers
Year of manufacture:	2015
Cylinder capacity:	4,009 c.c.

### **2. DV used for comparison**

<b>Registration Mark</b>	<b>TG7932</b>
Make:	HINO
Model:	300 Series XZU710R-HKFQT3
Class:	Light Goods Vehicle
Gross vehicle weight:	5.5 tonnes
Seating capacity:	Driver + 2 passengers
Year of manufacture:	2014
Cylinder capacity:	4,009 c.c.

## Appendix 2: Photos of Vehicles

### 1. Trial HV

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

## 2. DV for Comparison

	
<p>Front view of DV</p>	<p>Rear view of DV</p>
	
<p>Left side view of DV</p>	<p>Right side view of DV</p>