

Pilot Green Transport Fund

Interim Report On
Trial of Hybrid Light Goods Vehicle
for Chemical Products Delivery
(Shing Hing Chemical Company Limited)

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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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(Shing Hing Chemical Company Limited)

Interim Report
(Trial Period: 1 April 2018 – 31 March 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 Shing Hing Chemical Company Limited (Shing Hing) was approved under the Fund for trial of one hybrid light goods vehicle for chemical products delivery. Through the tendering procedures stipulated in the Subsidy Agreement, Shing Hing procured one Hino 300 Series Hybrid Light Goods Vehicle (HV) for trial.

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 vehicle. One Isuzu diesel light goods vehicle (DV) providing the same type of service was assigned as the conventional vehicle for comparing with the HV.

1.3 This report summarizes the performance of the HV in the first twelve months of the trial as compared with its conventional counterpart, i.e. the DV.

2. Trial Vehicles

2.1 The HV had a gross vehicle weight (GVW) of 5,500 kg and a cylinder capacity of 4,009 c.c. The DV had a GVW of 5,500 kg and a cylinder capacity of 4,751 c.c. The vehicles were used to deliver chemical products to clients without a fixed service area.

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

3. Trial Information

3.1 The trial started on 1 April 2018 and would last for 24 months. Shing Hing 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. A similar set of 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.

4. Findings of Trial

4.1 Table 1 summarizes the statistical data of the HV and the DV. The average fuel cost of the HV was HK\$0.09/km (3.4%) lower than that of the DV and the average total operating cost of the HV was HK\$0.22/km (7.4%) lower than that of the DV.

Table 1: Key Operation Statistics of Each Vehicle (April 2018 to March 2019)

| | | HV | DV |
|--|------------|-----------|-----------|
| Total mileage | (km) | 19,643 | 21,164 |
| Average fuel economy | (km/litre) | 5.44 | 5.23 |
| Average fuel cost (HK\$/km) ^[1] | | 2.52 | 2.61 |
| Average total operating cost/ (HK\$/km) ^[2] | | 2.74 | 2.96 |
| Downtime/ working day ^[3] | | 2 | 2 |

^[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] 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.

4.2 During the first twelve months of the trial, the HV had three scheduled maintenances resulting in a downtime of two working days while the DV had no scheduled maintenance.

4.3 There was no unscheduled maintenance for the HV, while the DV had two unscheduled maintenance resulting in downtime of two working days.

4.4 The HV and the DV both had two days of operation downtime in this reporting period. Utilization rates of the HV and the DV were both 99%.

5. Summary

5.1 During the first twelve months of the trial, the HV incurred a lower fuel cost which was HK\$0.09/km (3.4%) lower than that of the DV and the average total operating cost of the HV was HK\$0.22/ km (7.4%) lower than that of the DV. Utilization rates of the HV and the DV were both 99%.

5.2 The HV driver shared the view that driving the HV was more comfortable than driving the DV, and the HV was quieter than the DV. Also, the HV produced less air pollutants. However, both the HV driver and Shing Hing expressed that the HV had comparatively lower power when climbing uphill and also at start up.

5.3 In general, Shing Hing and the driver were satisfied with the performance of HV, disregarding the comparatively lower power for acceleration and climbing uphill with loading.

5.4 The findings only reflect the performance of the HV in the first twelve months of the trial. The performance and reliability of the HV will be further tested under this 24-month trial.

Appendix 1: Key Features of Vehicles

1. Trial HV

| | |
|--------------------------|----------------------------------|
| Registration Mark | CM9788 |
| Make: | Hino |
| Model: | 300 Series Hybrid XKU710R-HKUQS3 |
| Class: | Light Goods Vehicle |
| Gross vehicle weight: | 5,500 kg |
| Seating capacity: | Driver + 2 passengers |
| Cylinder capacity: | 4,009 c.c. |
| Maximum Output (ps/rpm): | 150/2,500 |
| Battery Type: | Nickel-Metal hydride |
| Year of manufacture: | 2017 |

2. DV for comparison

| | |
|--------------------------|-----------------------|
| Registration Mark | CV8089 |
| Make: | Isuzu |
| Model: | NPR70LU-5JMF-D |
| Class: | Light Goods Vehicle |
| Gross vehicle weight: | 5,500 kg |
| Seating capacity: | Driver + 2 passengers |
| Cylinder capacity: | 4,751 c.c. |
| Year of manufacture: | 2005 |

Appendix 2: Photos of Vehicles

1. Trial HV

| | |
|---|--|
|  <p>2019/04/12 12:25</p> |  <p>2019/04/12 12:25</p> |
| Front view of HV | Rear view of HV |
|  <p>2019/04/12 12:25</p> |  <p>2019/04/12 12:25</p> |
| Side view of HV | Side view of HV |

2. DV for comparison



Front view of DV



Rear view of DV



Side view of DV



Side view of DV