Pilot Green Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Hostel Management
(Hong Kong Youth Hostels Association)

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(Hong Kong Youth Hostels Association)

Interim Report
(Trial Period: 1 February 2021 – 31 January 2022)

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. Hong Kong Youth Hostels Association (HKYHA) was approved under the Fund for trial of one electric light goods vehicle. Through the tendering procedures stipulated in the Subsidy Agreement entered into with the Government, HKYHA procured one Nissan e-NV200, electric light goods vehicle (EV) for trial.

1.2 PolyU Technology and Consultancy Company Limited 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.

1.3 HKYHA assigned a Toyota KDH200RSSPDY diesel light goods vehicle (DV), which provided the same service, as the conventional counterpart for comparison purpose. The DV was disposed in March 2020 and the EV replaced it. HKYHA has provided 1-year historical data of the DV (February 2019 to January 2020) for comparison with the EV performance.

1.4 This Interim Report summarizes the performance of the EV in the first twelve months of the trial and compares it with the historical data of its conventional counterpart, i.e. DV.

2. Trial and Conventional Vehicles

2.1 The trial EV, Nissan e-NV200 electric light goods vehicle, has a gross vehicle weight of 2,250 kg capable of carrying a driver with four passengers and goods. It has a 40 kWh lithium-ion battery pack and the driving range is 317 km with air-conditioning off. HKYHA assigned a designated driver for the EV. HKYHA provided 1-year historical data of the disposed DV, Toyota KDH200RSSPDY 2,494 c.c. diesel light goods vehicle, for comparison in this trial. The vehicles were used mainly for delivering equipment or food among different HKYHA hostels.

2.2 HKYHA has installed a 7 kW, single phase AC charging facility for charging the EV. Key features of the EV and the DV as well as the EV charging facility are presented in Appendix 1 and their photos are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 February 2021 and would last for 24 months. HKYHA was required to collect and provide trial information including the EV mileage reading before charging, amount of electricity consumed in each charging, time taken for charging, operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenances of the EV and charging facility. A similar set of historical data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the driver were collected to reflect any problems of the EV.

4. Findings of Trial

4.1 Table 1 summarizes the statistical data of the EV and the DV.

Table 1: Key operation statistics of each vehicle (1 February 2021 – 31 January 2022)

		EV	**DV**
Total mileage (km)		20,744	17,187
Average daily mileage (km/working day)		71	58
Average fuel economy	(km/kWh)	4.73	-
	(km/litre)	-	9.62
	(km/MJ)	1.31	0.27 [1]
Average fuel cost (HK$/km) [2]		0.26	1.75
Average total operating cost per km (HK$/km)		0.43	2.09
Downtime (working day) [3]		3	1

[1] Assuming lower heating value of 36.13 MJ/litre for diesel fuel.
[2] The market fuel prices from 1 February 2021 to 31 January 2022, were used for calculation.
[3] Downtime refers to the working days that 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.

4.2. During the first 12 months of the trial, the total mileage and the average daily mileage of the EV were 20,744 km and 71 km/day, respectively while those of the DV were 17,187 km and 58 km/day, respectively. The average fuel cost of the EV was HK$1.49/km (i.e., about 85%) lower than that of the DV. Taking maintenance fee for both the EV and the DV into account, the average total operating cost of the EV was HK$1.66/km (i.e., about 79%) lower than that of the DV.

4.3 In the first twelve months of trial, there were 296 working days. Regarding the maintenance related to the performance of the vehicle, the EV had undergone a scheduled maintenance resulting in a downtime of 3 working days while the DV had undergone a scheduled maintenance resulting in a downtime of 1 working day. The utilization rates of the EV and the DV were 99.0% and 99.6%, respectively.

4.4 The operation of the EV was smooth. The EV driver had no problem in operating the EV and considered it was clean and quiet. Both the driver and HKYHA were satisfied with the EV performance.

5. Summary

5.1 In the first twelve months of the trial, the average daily mileages of the EV and DV were 71 km and 58 km, respectively.

5.2 The data showed that the EV had lower fuel cost than the DV, with an average fuel cost saving of about 85%. Accounting the maintenance costs incurred for both the EV and the DV, the average total operating cost saving of the EV was about 79% lower than that of the DV.

5.3 The utilization rates of the EV and the DV were 99.0% and 99.6%, respectively.

5.4 The driver had no problem in operating the EV and considered it was clean and quiet. HKYHA was also satisfied with the EV performance in general.

5.5 The findings only reflect the performance of the EV in the first twelve months of the trial. The performance and reliability of the EV will be continuously monitored in the 24 months of the trial.

Appendix 1: Key Features of Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) EV

Registration mark	**JS9131**
Make:	Nissan
Model:	e-NV200
Class:	Light goods vehicle
Gross vehicle weight:	2,250 kg
Seating capacity:	Driver + 4 passengers
Rated power:	80 kW
Travel range:	317 km (air conditioning off)
Battery material:	Lithium-ion
Battery capacity:	40 kWh
Year of manufacture:	2019

(b) Charging Facility

Make:	Shun Hing
Model:	DH-AC0070XG20-H
Power:	7 kW, single phase AC
Charging standard:	IEC 61851
Weight:	4 kg
Year of manufacture:	2020

2. DV Used for Comparison

Registration mark:	**JS9131** [1]
Make:	Toyota
Model:	KDH200RSSPDY
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Seating capacity:	Driver + 2 passengers
Cylinder capacity:	2,494 cc
Year of manutfacture:	2005

[1] The DV had been disposed in March 2020. The EV replaced the DV and used the same registration mark (JS9131).

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV (JS9131) and Charging Facility

<table>
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<tr><td>Front view of EV</td><td>Rear view of EV</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Left side view of EV</td><td>Right side view of EV</td></tr>
<tr><td>  </td><td></td></tr>
<tr><td>7 kW, single phase AC charger</td><td></td></tr>
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2. DV (JS9131) for Comparison

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