New Energy Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Retailing Industry
(Pat Chun International Limited)

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(Trial Period: 1 October 2022 – 31 March 2023)

Executive Summary

1. Introduction

1.1 The New Energy 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. Pat Chun International Limited (Pat Chun) 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, Pat Chun procured a Nissan e-NV200 electric light goods vehicle (EV) for trial.

1.2 Hong Kong Productivity Council has been engaged by the Environmental Protection Department [1] as an independent third-party assessor to monitor the trial and evaluate the performance of the trial vehicle. Pat Chun assigned a diesel light goods vehicle (DV) providing same services as the conventional counterpart for comparison.

1.3 This Interim Report summarises the performance of the EV in the first six months of the trial as compared with its conventional counterpart.

2. Trial and Conventional Vehicles

2.1 The trial EV, Nissan e-NV200 electric light goods vehicle, has a gross vehicle weight (GVW) of 2,250 kg capable of carrying a driver with 4 passengers and goods. It has a 40 kWh Lithium-ion battery pack and the driving range is 317 km with air-conditioning off. There is a designated driver assigned to drive the EV. The DV, Hino 300 series XZU710R-HKFQT3 diesel light goods vehicle with a GVW of 5,500 kg and a cylinder capacity of 4,009 c.c., was used as the conventional counterpart for comparison in this trial. There is another designated driver assigned to drive the DV. Both the EV and the DV provide the same services for delivering food to retail stores in Hong Kong.

2.2 Pat Chun has installed a designated 7.4 kW single phase AC charging facility at its own cost for charging the EV. Key features of the EV, the charging facility and the DV are presented in Appendix 1. The photos of vehicles and the charging facility are shown in Appendix 2.

[1] The Administration of the New Energy Transport Fund was migrated to the Environment Branch of the Environment and Ecology Bureau [EEB (Environment Branch)] since 1 January 2023 after internal re-organisation of EEB (Environment Branch) and EPD.

3. Trial Information

3.1 The trial commenced on 1 October 2022 and would last for 12 months. Pat Chun was required to collect and provide trial information including the EV's 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. Similar data of the DV were also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers were collected and provided to reflect any problems of the EV.

4. Findings of Trial

4.1 Table 1 summarises the statistical data of the EV and the DV in the first six months of the trial period.

Table 1: Key operation statistics of each vehicle (1 October 2022 – 31 March 2023)

		EV	**DV**
Total distance travelled (km)		8,122	11,698
Average daily distance travelled (km/working day)		55	95
Average fuel economy	(km/kWh)	4.28	-
	(km/litre)	-	5.68
	(km/MJ)	1.19	0.16 [1]
Average fuel cost (HK$/km)		0.34 [2]	3.69 [3]
Average total operating cost (HK$/km)		0.34	3.69
Downtime (working day) [4]		0	0

[1] Assuming lower heating value of 36.13 MJ/litre for diesel fuel.

[2] The electricity cost was calculated using average electricity tariff rates of HK$1.289/kWh (October 2022), HK$1.451/kWh (November 2022 – December 2022), HK$1.544/kWh (January 2023 – February 2023) and HK$1.552/kWh (March 2023) as claimed by CLP.

[3] The market fuel price was used for calculation.

[4] Downtime refers to the working days that the vehicle is not in operation due to charging or maintenance, counting from the first day it stops operation till the day it is returned to the operator.

4.2. During the six months of the trial, there were 148 working days. The total distance travelled and the average daily distance travelled of the EV were 8,122 km and 55 km/day, respectively while those of the DV were 11,698 km and 95 km/day, respectively. The average fuel cost of the EV was HK$3.35/km (about 91%) lower than that of the DV. Taking the maintenance fee for both the EV and the DV into account, the average total operating cost of the EV was the same as the average fuel cost.

4.3 Neither the EV nor the DV had any maintenance in the first six months of the trial period. Therefore, the utilisation rates of both the EV and the DV were 100%.

4.4 The driver of the EV had no problem in operating the vehicle and was satisfied with the performance of the EV.

5. Summary

5.1 In the first six months of the trial, the average daily distance travelled of the EV was 55 km, while that of the DV was 95 km.

5.2 Both the average fuel cost and the average total operating cost of the EV were HK$3.35/km (about 91%) lower than those of the DV.

5.3 The utilisation rates of both the EV and the DV were 100%.

5.4 The driver of the EV had no problem in operating the vehicle and was satisfied with the performance of the EV.

5.3 The findings only reflect the performance of the EV in the first 6 months of the trial. The performance and reliability of the EV will be continuously monitored in the 12 months of the trial.

Appendix 1: Key Features of Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) EV

Registration mark:	**XY7200**
Make:	Nissan
Model:	e-NV200 Half Panel Van
Class:	Light goods vehicle
Gross vehicle weight:	2,250 kg
Payload:	658 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:	2021

(b) EV Charging Facility (At Recipient's own cost)

Make:	Zencar
Model:	32A EVSE portable adjustable SAE J1772
Power:	7.4 kW, 220V AC / max. 32A
Charging standard:	SAE J1772 Type 1

2. DV Used for Comparison

Registration mark:	**UH5703**
Make:	Hino
Model:	300 Series XZU710R-HKFQT3
Class:	Light goods vehicle
Gross vehicle weight:	5,500 kg
Payload	1,800 kg
Seating capacity:	Driver + 2 passengers
Cylinder capacity:	4,009 c.c.
Year of manufacture:	2015

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

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<tr><td>Front view of EV</td><td>Rear view of EV</td></tr>
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<tr><td>Left side view of EV</td><td>Right side view of EV</td></tr>
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<tr><td>Charging facility – 7.4 kW single-phase AC charger (at Recipient’s own cost)</td><td></td></tr>
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2. DV Used for Comparison

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