New Energy Transport Fund

Interim Report On Trial of Electric Light Goods Vehicle for Fish Delivery (Fish Marketing Organization)

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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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New Energy Transport Fund Trial of Electric Light Goods Vehicle for Fish Delivery (Fish Marketing Organization)

Interim Report (Trial Period: 1 May 2022 – 31 October 2022)

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. Fish Marketing Organization (FMO) 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, FMO procured one Joylong EW5, electric light goods vehicle (EV) for trial.

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

1.3 This Interim Report summarizes 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, Joylong EW5 electric light goods vehicle, has a gross vehicle weight of 4,300 kg capable of carrying a driver with one passenger and goods. It has a 73.4 kWh Lithiumion battery pack and the driving range is 330 km with air conditioning off. There are two designated drivers assigned to drive the EV. The DV, Toyota Hiace diesel light goods vehicle with a gross vehicle weight of 2,800 kg and a cylinder capacity of 2,982 c.c., was used as the conventional counterpart for comparison in this trial. The vehicles were used mainly for delivering fish in Hong Kong.

2.2 FMO has installed a 30 kW DC charger for charging the EV. Key features of the EV and the DV as well as the EV charging facility are presented in Appendix 1. The photos of vehicles and the EV charging facility are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 May 2022 and would last for 12 months. FMO 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. 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 summarizes the statistical data of the EV and the DV in the first six months of the trial period.

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		EV	DV
Total distance travelled (km)		2,121	6,437
Average daily distance travelled (km/working day)		13	35
Average fuel economy	(km/kWh)	2.58	-
	(km/litre)	-	9.64
	(km/MJ)	0.72	0.27 [1]
Average fuel cost (HK\$/km)		0.52 [2]	2.23 [3]
Average total operating cost (HK\$/km)		0.52	3.49
Downtime (working day) ^[4]		15	2

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

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

^[2] The electricity cost was calculated using an average electricity tariff rate of HK\$1.353/kWh as claimed by HEC for 2022.

^[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 184 working days. The total distance travelled and the average daily distance travelled of the EV were 2,121 km and 13 km/day, respectively while those of the DV were 6,437 km and 35 km/day, respectively. The average fuel cost of the EV was HK\$1.71/km (about 77%) 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 HK\$2.97/km (about 85%) lower than that of the DV.

4.3 The EV had 4 unscheduled maintenance while the DV had 1 scheduled maintenance in the first six months of the trial period. The EV had 15 days of maintenance related downtime while the DV had 2 days of maintenance related downtime. Therefore, the utilization rates of the EV and the DV were 91.8% and 98.9%, respectively.

5. Summary

5.1 In the first six months of the trial, the average daily distance travelled of the EV was 13 km, while that of the DV was 35 km.

5.2 The average fuel cost of the EV was HK\$1.71/km (about 77%) lower than that of the DV. The average total operating cost of the EV was HK\$2.97/km (about 85%) lower than that of the DV, taking the maintenance fee for both the EV and the DV into account.

5.3 The utilization rates of the EV and the DV were 91.8% and 98.9%, respectively.

5.4 The drivers of the EV had no problem in operating the EV and agreed that the EV is quieter. In addition, they are willing to promote the EV to other drivers.

5.5 There were 4 unscheduled maintenances for the EV in the first six months of the trial period, and resulted in a total loss of 15 working days. In fact, all of these unscheduled maintenances were happened in the first three months of the trial. Noted the required maintenance were all related to the performance of EV and some of the problems occurred repeatedly within short period of time, the reliability of the EV was thus of concern. However, as there was no maintenance for the EV from 4th to 6th months of the trial, the problems could have been fixed.

5.6 The findings only reflect the performance of the EV in the first six 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

XW2964
Joylong
EW5
Light goods vehicle
4,300 kg
1,300 kg
Driver + 1 passenger
50 kW
330 km (air conditioning off)
Lithium-ion
73.4 kWh
2021

(b) EV Charging Facility

Make:	Only Power Supply
Model:	ANDC5-500V/60A-1
Power:	30 kW, 500V DC / max 60A
Charging standard:	GB mode

2. DV Used for Comparison

Registration mark	RS5017
Make:	Toyota
Model:	Hiace Diesel
Class:	Light goods vehicle
Gross vehicle weight:	2,800 kg
Payload:	850 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,982 c.c.
Year of manufacture:	2012

Appendix 2: Photos of Vehicles and Charging Facility



1. Trial EV (XW2964) and Charging Facility

2. DV (RS5017) for Comparison

