New Energy Transport Fund

Final Report
On
Trial of Electric Light Goods Vehicles for Decoration Works
(Fuk Ming Decoration Works)

(30 May 2025)

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(Reporting Period: 1 July 2023 - 30 June 2024)

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. Fuk Ming Decoration Works (Fuk Ming) was approved under the Fund for trial of two electric light goods vehicles for decoration works. Fuk Ming, through the tendering procedures stipulated in the Subsidy Agreement entered with the Government, procured two Joylong EW4 electric light goods vehicles (EV) for trial.

1.2 Hong Kong Productivity Council has been commissioned by the Environment and Ecology Bureau (Environment Branch) (EEB) as an independent third-party assessor (the Assessor) to monitor the trial and evaluate the performance of the trial vehicles. Fuk Ming assigned two diesel light goods vehicles (DV) providing same services as the conventional counterparts for comparison.

1.3 This Final Report summarises the performance of the EVs in the 12 months of the trial as compared with their conventional counterparts, i.e. the DVs.

2. Trial and Conventional Vehicles

2.1 Each of the trial EV, Joylong EW4 electric light goods vehicle, has a gross vehicle weight (GVW) of 3,700 kg, capable of carrying a driver with five passengers and goods. It has a 73 kWh lithium-ion battery pack. According to its manufacturer, it has a driving range of 300 km with air-conditioning off. There is no designated driver assigned to drive the EVs. The DVs, a Toyota Hiace Diesel LWB, with a GVW of 2,800 kg and a cylinder capacity of 2,982 c.c. and a Toyota Hiace, with a GVW of 3,300 kg and a cylinder capacity of 2,755 c.c., were used as the conventional counterparts for comparison in this trial. There is no designated driver assigned to drive the DVs. Both the EVs and the DVs were used for delivering tools and materials to different construction and renovation sites in Hong Kong.

2.2 Fuk Ming has installed 2 units of 30 kW DC charging facility for charging the EVs. Key features of the EVs and the DVs as well as the EV charging facilities are presented in Appendix 1. The photos of vehicles and the EV charging facilities are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 July 2023 and lasted for 12 months. Fuk Ming was required to collect and provide trial information including the EV's mileage reading before charging, amount of electricity consumed, and time used in each charging, operation downtime due to charging, and cost and downtime associated with scheduled and unscheduled maintenances of the EVs and the charging facilities. Similar data of the DVs were also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers and Fuk Ming were collected to reflect any problems of the EVs.

4. Findings of Trial

4.1 The following table summarises the statistical data of the EVs and the DVs. The fleet average fuel cost of the EVs was HK$1.94/km (about 79%) lower than that of the DVs. Taking the maintenance fee and other costs into account, the fleet average total operating cost of the EVs was HK$1.82/km (about 69%) lower than that of the DVs in the 12 months of the trial.

Table 1: Key operation statistics of each vehicle (1 July 2023 - 30 June 2024)

		EV		**DV**	
		EV-1	**EV-2**	**DV-1**	**DV-2**
Total distance travelled (km)		18,751	18,235	24,495	51,321
Average daily mileage (km/working day)		54	52	70	147
Average fuel economy	(km/kWh)	2.89	2.83	-	-
	(km/litre)	-	-	9.14	9.56
	(km/MJ)	0.80	0.79	0.25 [1]	0.26 [1]
Fleet average fuel economy (km/MJ)		0.80		0.26	
Average fuel cost (HK$/km)		0.52 [2]	0.52 [2]	2.51 [3]	2.41 [3]
Fleet average fuel cost (HK$/km)		0.52		2.46	
Average total operating cost (HK$/km) [3]		0.79	0.81	2.72	2.51
Fleet average total operating cost per km (HK$/km)		0.80		2.62	
Downtime (working day) [4][5]		2	2	1	1

[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$1.535/kWh (Jul-23); HK$1.508/kWh (Aug-23); HK$1.482/kWh (Sep 2023); HK$1.459/kWh (Oct 2023); HK$1.442/kWh (Nov 2023); HK$1.431/kWh (Dec 2023); HK$1.523/kWh (Jan 2024 – Feb 2024); HK$1.513/kWh (Mar 2024); HK$1.507/kWh (Apr 2024); HK$1.499/kWh (May 2024); and HK$1.500/kWh (Jun 2024) as reported by CLP.

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

[4] Maintenance due to incident not related to the performance of the vehicle was not included for comparing the performance.

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

4.2 Apart from the fuel cost, maintenance cost and other indirect costs which may include parking fee, towing fee, vehicle replacement fee and cost of operation downtime due to charging and maintenance of the EVs are also included in Table 1. In the 12 months of the trial period, the EVs and the DVs had one scheduled maintenance. The EV-1 had one unscheduled maintenance. The unscheduled maintenance of the EV-1 was not performance-related maintenance, and the induced cost and downtime were excluded from the evaluation.

4.3 In the 12 months of the trial period, both the EVs had 2 days of downtime, and both the DVs had 1 day of downtime. Hence, the fleet utilisation rates of the EVs and the DVs were 99.4% and 99.7%.

4.4 The drivers of the EVs liked driving the EVs and had no operation difficulties in driving the EVs. Overall, they were satisfied with the performance of the EVs. Fuk Ming was satisfied with the EVs since the EVs could meet the operational requirements and save the operation cost. Given the opportunity, Fuk Ming would encourage other transport operators to try the EVs.

4.5 It is observed that the amount of electricity stored in the battery after a full charging operation could be maintained at the level of 73 kWh for the EVs after the 12-month trial period. Thus, the deterioration in battery capacity within the 12-month trial period was insignificant, if any.

4.6 Based on the total mileage of the EVs and the fuel economy of the DVs, the equivalent carbon dioxide (CO_2e) emission from the DVs could be estimated for comparison purpose. In the 12-month trial period, the total CO_2e emission from the EVs was 4,982 kg while that from the DVs was 10,972 kg. Hence, there was a total reduction of 5,990 kg (about 55%) CO_2e of the fleet, with the replacement of the DVs by the EVs in the trial.

5. Summary

5.1 The fleet average fuel cost of the EVs was HK$1.94/km (about 79%) lower than that of the DVs. Taking the maintenance fee and other costs into account, the fleet average total operating cost of the EVs was HK$1.82/km (about 69%) lower than that of the DVs. The fleet utilisation rates of the EVs and the DVs were 99.4% and 99.7%. There was a 5,990 kg (about 55%) reduction of CO_2e, with the replacement of the DVs by the EVs in the trial.

5.2 It is observed that the amount of electricity stored in the battery after a full charging operation could be maintained at the level of 73 kWh for the EVs after the 12-month trial period. Thus, the deterioration in battery capacity within the 12-month trial period was insignificant, if any.

5.3 The drivers of the EVs liked driving the EVs and had no operation difficulties in driving the EVs. Overall, they were satisfied with the performance of the EVs. Fuk Ming was satisfied with the EVs since the EVs could meet the operational requirements and save the operation cost. Given the opportunity, Fuk Ming would encourage other transport operators to try the EVs.

5.4 The findings showed electric light goods vehicles are becoming more affordable and feasible to the transport trade for saving operating cost and reducing CO_2e emissions, provided that the vehicles can get easy access to charging facilities.

Appendix 1: Key Features of Vehicles and Charging Facilities

1. Trial EVs and Charging Facilities

Trial EVs

Registration mark:	**YN7124 (EV-1)**
Make:	Joylong
Model:	EW4
Class:	Light goods vehicle
Gross vehicle weight:	3,700 kg
Payload:	1,100 kg
Seating capacity:	Driver + 5 passengers
Rated power:	50 kW
Driving range:	300 km (air-conditioning off)
Battery material:	Lithium-ion
Battery capacity:	73 kWh
Year of manufacture:	2022

Registration mark:	**YN7406 (EV-2)**
Make:	Joylong
Model:	EW4
Class:	Light goods vehicle
Gross vehicle weight:	3,700 kg
Payload:	1,100 kg
Seating capacity:	Driver + 5 passengers
Rated power:	50 kW
Driving range:	300 km (air-conditioning off)
Battery material:	Lithium-ion
Battery capacity:	73 kWh
Year of manufacture:	2023

EV Charging Facilities

No. of Charging Facility:	2
Make:	Only Power Supply
Model:	ANDC5-500V/60A-1
Power:	30 kW, 500V DC / max 60A
Charging standard:	GB Mode

2. DVs Used for Comparison

Registration mark:	**RH1613 (DV-1)**
Make:	Toyota
Model:	Hiace Diesel LWB
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

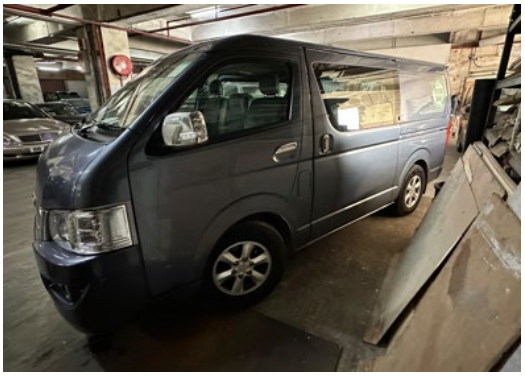
Registration mark:	**WH2090 (DV-2)**
Make:	Toyota
Model:	Hiace
Class:	Light goods vehicle
Gross vehicle weight:	3,300 kg
Payload:	935 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,755 c.c.
Year of manufacture:	2019

Appendix 2: Photos of Vehicles and Charging Facilities

1. Trial EVs and Charging Facilities

a) Trial EVs

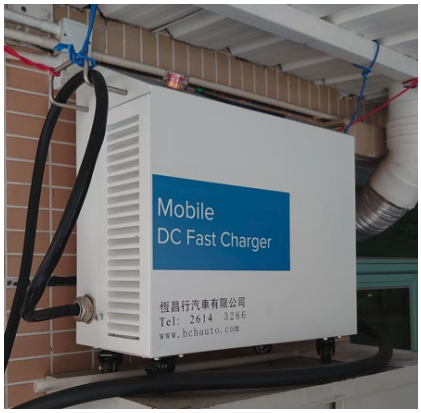
EV-1 (YN7124)

	
Front view of EV	Rear view of EV
	
Left side view of EV	Right side view of EV

EV-2 (YN7406)

	
Front view	Rear view
	
Left side view	Right side view

b) Charging Facilities

	
30 kW DC Charging Facility #1	30 kW DC Charging Facility #2

2. DVs Used for Comparison

DV-1 (RH1613)

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

DV-2 (WH2090)

	
Front view	Rear view
	
Left side view	Right side view