

Pilot Green Transport Fund

Interim Report

On

**Trial of Electric Light Goods Vehicle for Electrical
Engineering Industry
(Sendon Electrical Service)**

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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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Trial of Electric Light Goods Vehicle for Electrical Engineering Industry
(Sendon Electrical Service)

Interim Report
(Trial Period: 1 December 2020 – 31 May 2021)

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. Sendon Electrical Service (Sendon) was approved under the Fund for trial of one electric light goods vehicle for providing electrical installation and maintenance services. Through the tendering procedures stipulated in the Subsidy Agreement signed with the Government, Sendon procured a Joylong EW4-A 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. Sendon assigned a Nissan 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 and compares it with the performance of its conventional counterpart, i.e. DV.

2. Trial and Conventional Vehicles

2.1 The trial EV, Joylong EW4-A electric light goods vehicle, has a gross vehicle weight (GVW) of 3,700 kg capable of carrying a driver with five passengers and goods. The EV contains a 64.8 kWh lithium-ion battery pack. According to its manufacturer, it has a driving range of 260 km with air-conditioning off. A designated driver was assigned for the EV.

2.2 Sendon assigned the DV, Nissan URVAN 3.0L DIESEL M/T HPV diesel light goods vehicle, with a GVW of 3,300 kg capable of carrying a driver and five passengers and goods, and a cylinder capacity of 2,953 cc for comparison with the EV.

2.3 The vehicles are mainly used to provide electrical installation and maintenance services in the New Territories, Kowloon and Hong Kong Island. The services are conducted from Monday to Sunday, except Lunar New Year holiday. The operating hours are from 09:00 to 18:00.

2.4 Sendon has installed a 30 kW, 3-phase DC charger at its carpark. It takes around 3 hours for fully charging the EV. Key features of the EV, the charging facility and the DV are presented in Appendix 1 and their photos are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 December 2020 and would last for 24 months. Sendon 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 driver 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.

Table 1: Key operation statistics of each vehicle (1 December 2020 – 31 May 2021)

		EV	DV
Total mileage (km)		10,203	9,374
Average daily mileage (km/working day)		58	53
Average fuel economy	(km/kWh)	3.41	-
	(km/litre)	-	9.17
	(km/MJ)	0.94	0.25 ^[1]
Average fuel cost (HK\$/km) ^[2]		0.36	1.71
Average total operating cost per km (HK\$/km)		0.65	1.71
Downtime (working day) ^[3]		3	0

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

^[2] The market fuel price was 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 six months of the trial, there were 178 working days. The EV had 3-day downtime due to a scheduled maintenance, while the DV had no maintenance and downtime. The utilization rates of the EV and the DV were 98% and 100%, respectively.

4.3 During the first six months of the trial, the total mileage and the average daily mileage of the EV were 10,203 km and 58 km/day respectively while those of the DV were 9,374 km and 53 km/day respectively. The average fuel cost of the EV was HK\$1.35/km (79%) lower than that of the DV. The average total operating cost of the EV was HK\$1.06/km (62%) lower than that of the DV, taking into account the maintenance costs.

4.4 The driver had no problem in operating the EV and was satisfied with its performance, and liked the EV as it was cleaner and quieter than the DV.

5. Summary

5.1 In the first six months of the trial, the average daily mileage of the EV was 58 km/day while that of the DV was 53 km/day. The average fuel cost of the EV was HK\$1.35/km (79%) lower than that of the DV. The average total operating cost of the EV was HK\$1.06/km (62%) lower than that of the DV.

5.2 The utilization rates of the EV and the DV were 98% and 100%, respectively.

5.3 Overall, the driver had no problem in operating the EV and was satisfied with its performance.

5.4 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 24 months of the trial.

Appendix 1: Key Features of Vehicles and Charging Facility

1. Trial EV

(a) EV

Registration mark:	WR8083
Make:	Joylong
Model:	EW4-A
Class:	Light goods vehicle
Gross vehicle weight:	3,700 kg
Seating capacity:	Driver + 5 passengers
Rated power:	50 kW
Travel range:	260 km (air conditioning off)
Maximum speed:	100 km/h
Battery material:	Lithium-ion
Battery capacity:	64.8 kWh
Year of manufacture:	2019

(b) Charging Facility

Make:	Hangzhou AoNeng Power Supply Equipment Co. Ltd.
Model:	ANDC5-500V/60A-1
Type:	3-phase, 380V, movable type
Power:	30 kW, DC (max 500V / 60A)
Charging Standard:	GB

2. DV Used for Comparison

Registration mark	DR791
Make:	Nissan
Model:	URVAN 3.0L DIESEL M/T HPV
Class:	Light goods vehicle
Gross vehicle weight:	3,300 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,953 cc
Year of manufacture:	2010

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV (WR8083) and Charging Facility



Front view of EV



Rear view of EV



Left side view of EV



Right side view of EV



30 kW, 3-phase DC charger

2. DV (DR791) for Comparison



Front view of DV



Rear view of DV



Left side view of DV



Right side view of DV