

Pilot Green Transport Fund

Interim Report

On

Trial of Electric Light Goods Vehicle for

Vehicle Maintenance Service

(New Creat Auto Engineering Company Limited)

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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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Interim Report
(Trial Period: 1 April 2020 – 31 March 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. New Creat Auto Engineering Company Limited (New Creat) was approved under the Fund for trial of one electric light goods vehicle for providing vehicle maintenance parts transportation service. Through the tendering procedures stipulated in the Subsidy Agreement signed with the Government, New Creat procured one Joylong EW4 electric light goods vehicle (EV) for trial.

1.2 PolyU Technology and Consultancy Company Limited has been engaged by the Environmental Protection Department (EPD) as an independent third party assessor (the Assessor) to monitor the trial and evaluate the performance of the trial vehicle. New Creat assigned a Ssangyong STAVIC diesel light goods vehicle (DV) providing same service as the conventional counterpart for comparison.

1.3 This Interim Report summarizes the performance of the EV in the first twelve 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 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 73 kWh lithium-ion battery pack. According to its manufacturer, it has a driving range of 300 km with air-conditioning off. No designated driver was assigned for the EV.

2.2 New Creat assigned a Ssangyong STAVIC SV270 diesel light goods vehicle with a GVW of 2,750 kg capable of carrying a driver and four passengers and goods, and a cylinder capacity of 2,696 cc for comparison with the EV.

2.3 The vehicles are mainly used to provide vehicle maintenance parts transportation service in the New Territories and Kowloon areas. The services are conducted from Monday to Saturday, except Sunday and public holidays. The operating hours are from 09:00 to 19:00.

2.4 New Creat has installed a 30 kW, 3-phase DC charger at its carpark. It takes around 3 hours for fully charging 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 April 2020 and would last for 24 months. New Creat 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 and New Creat 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 April 2020 – 31 March 2021)

		EV	DV
Total mileage (km)		9,037	11,567
Average daily mileage (km/day)		31	39
Average fuel economy	(km/kWh)	3.43	-
	(km/litre)	-	7.65
	(km/MJ)	0.95	0.21 ^[1]
Average fuel cost (HK\$/km) ^[2]		0.36	1.91
Average total operating cost per km (HK\$/km) ^[3]		0.43	2.08
Downtime (working day) ^{[3][4]}		1	3

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

^[2] The market fuel price was used for calculation

^[3] Maintenance unrelated to the performance of the vehicle was not included for comparison.

^[4] 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 twelve months of the trial, there were 296 working days. The EV had 1-day downtime due to a scheduled maintenance while the DV had 3-day downtime due to a scheduled maintenance. The utilization rates of the EV and the DV were 99.7% and 99.0%, respectively. The drivers found no problem in operating the EV and were satisfied with its performance. New Creat was also satisfied with the EV in general

4.3 During the first twelve months of the trial, the total mileage and the average daily mileage of the EV were 9,037 km and 31 km/day, respectively while those of the DV were 11,567 km and 39 km/day, respectively. The average fuel cost of the EV was HK\$1.55/km (81%) lower than that of the DV. The average total operating cost of the EV was HK\$1.65/km (79%) lower than that of the DV taking into account the maintenance costs.

5. Summary

5.1 In the first twelve months of the trial, the average daily mileage of the EV was 31 km/day while that of the DV was 39 km/day. The average fuel cost of the EV was HK\$1.55/km (81%) lower than that of the DV. The average total operating cost of the EV was HK\$1.65/km (79%) lower than that of the DV.

5.2 The utilization rates of the EV and the DV were 99.7% and 99.0%, respectively.

5.3 Overall, the drivers had no problem in operating the EV and were satisfied with its performance. New Creat was also satisfied with the EV performance.

5.4 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:	WG5264
Make:	Joylong
Model:	HKL5040XXYBEV1 (EW4)
Class:	Light goods vehicle
Gross vehicle weight:	3,700 kg
Seating capacity:	Driver + 5 passengers
Rated power:	50 kW
Travel range:	300 km (air conditioning off)
Maximum speed:	100 km/h
Battery material:	Lithium-ion
Battery capacity:	73 kWh
Year of manufacture:	2019

(b) Charging Facility

Make:	Only Power
Model:	ANDC5-500V/60A-1
Power:	30 kW, 3-phase, DC
Charging standard:	GB mode
Weight:	90 kg
Year of manufacture:	2019

2. DV used for Comparison

Registration mark:	NF4498
Make:	Ssangyong
Model:	STAVIC SV270
Class:	Light goods vehicle
Gross vehicle weight:	2,750 kg
Seating capacity:	Driver + 4 passengers
Cylinder capacity:	2,696 cc
Year of manufacture:	2008

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV (WG5264) 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 (NF4498) for Comparison



Front view of DV



Rear view of DV



Left side view of DV



Right side view of DV