Pilot Green Transport Fund

Interim Report On
Trial of Electric Van for Cleaning Service
(New Method)

(23 December 2015)

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Interim Report
(Trial Period: 1 August 2014 – 31 January 2015)

Executive Summary

1 Introduction

1.1 The Pilot Green Transport Fund (the Fund) is set up to encourage transport operators to try out green and innovative transport technologies, contributing to better air quality and public health for Hong Kong. New Method Cleaning Services Limited (NMC) was approved under the Fund for trial of one electric van-type light goods vehicle for cleaning service. Through the tendering procedures stipulated in the Subsidy Agreement NMC entered into with the Government, NMC procured one Renault Kangoo Van Z.E. (EV) for trial.

1.2 Hong Kong Institute of Vocational Education (Tsing Yi) (IVE(TY)) have 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 vehicles. NMC assigned one diesel vehicle (DV) providing similar services as the conventional vehicle for comparing with the EV.

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

2 Trial Vehicles

2.1 Key features of the EV and DV are in Appendix 1 and photos of the vehicles are in Appendix 2. The vehicles were used for transporting staff for cleaning service around Hong Kong. According to the EV's manufacturer, the model's maximum payload is limited to 650 kg and it has a travel range of 170 km under no load condition with its battery fully charged and air-conditioning off.

2.2 NMC has set up one dedicated 20A charger at their office in Yuen Long in August 2014. The EV was mainly charged using the standard EV charger. It took about 8 hours to fully charge the batteries. The EV was mostly charged once a day, usually from 10 p.m. to 7 a.m. next morning.

3 Trial Information

3.1 The trial started on 1 August 2014 and will last for 24 months. NMC was required to collect and provide trial information including the EV mileage reading before charging, amount of electricity consumed and time used in each charging, downtime due to charging cost and operation downtime associated with scheduled and unscheduled maintenance of the EV and the charging facilities. Similar monthly data from the DV was also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers were collected to reflect any problems of the EV.

3.2 The following table summarizes the statistical data of EV and DV. The average fuel cost of the EV was $1.02/km (83%) lower than the DV.

Table 1: Key operation statistics of each vehicle (August 2014 – January 2015)

		Electric van	**Diesel van**
		EV	**DV**
Total mileage / km		11,973	10,711
Average fuel economy	(km/kWh)	5.27	-
	(km/litre)	-	9.87
	(km/MJ)	1.46	0.273 [1]
Average fuel cost /($/km) [2]		0.208	1.23
Average total operating cost / ($/km)		0.432	1.23
Downtime [3]/ day		2	0

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

[2] The market fuel price was used for calculation

[3] Downtime refers to the accumulated days in which 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

3.3 Apart from the maintenance cost, other indirect costs may include towing fee, vehicle replacement fee and cost of operation downtime due to charging and maintenance of the EV. During the trial period, the EV had a scheduled maintenance but no unscheduled maintenance in the trial period. There was no operating downtime due to charging. The DV had no scheduled or unscheduled maintenance in the trial period.

3.4 Utilization rate was 98% for the EV and 100% for the DV.

4 Summary

4.1 The average fuel cost of the EV was 83% ($ 1.02/km) less than the DV. The average total operating cost of the EV was 65% ($ 0.798/km) less than the DV. Utilization rate was 98% for the EV and 100% for the DV.

4.2 The driver of the EV had no problem in operating the EV, however, NMC expressed that they were not satisfied with the limited driving range of the EV. It only supported around 80km when loaded and operated with air conditioning.

4.3 Charging frequency and monthly average fuel economy did not indicate any deterioration in performance of the EV or its battery.

Appendix 1: Key Features of Vehicles Involved in the Trial

1. Trial EV

Registration Mark	**MC3886**
Make:	Renault
Model:	Kangoo Van Z.E.
Class:	Light goods vehicle
Gross vehicle weight:	2.3 tonnes
Seating capacity:	driver + 4 passengers
Rated power:	44 kW
Travel range:	170 km (air-conditioning off)
Maximum speed:	130 km/h
Battery material:	Lithium ion
Batteries capacity:	22 kWh
Charging time:	8 hours (Max. current input 16A)
Payload:	650kg
Year of manufacture:	2014

2. DV used for comparison

Registration Mark	**RY2870**
Make:	NISSAN
Model:	URVAN 2.5L
Class:	Light goods vehicle
Seating capacity:	5 seats
Gross vehicle weight:	3.3 tonnes
Engine capacity:	2488 c.c.
Year of manufacture:	2013

Appendix 2: Photos of Vehicles and Charging Facilities

1. Trial Electric Van and Charging Facilities

	
EV - front view	EV - rear view
	
EV - side view 1	EV - odometer
	
Charger at the EV owner's office	Watt-hour meter for the charger

2. Diesel Vehicle for Comparison

	
DV	DV odometer