

Pilot Green Transport Fund

Interim Report On Trial of an Electric Van for French International School (FIS)

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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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Pilot Green Transport Fund
Trial of an Electric Van for French International School (FIS)

Interim Report
(Trial Period: 1 November 2015 – 30 April 2016)

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 (the innovative green technology), contributing to better air quality and public health for Hong Kong. French International School "Victor Segalen" Association Limited (FIS) was approved under the Fund for trial of one electric vehicle for school.

1.2 Hong Kong Institute of Vocational Education (Tsing Yi) 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.

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

2. Trial Vehicles

2.1 Through the tendering procedures stipulated in the Agreement, FIS procured one Renault Kangoo Van Z.E. light good vehicle (EV) for trial. One petrol vehicle (PV) providing similar services was assigned as the conventional vehicle for comparing with the EV.

2.2 Key features of the EV and the PV are in Appendix 1 and photos of the vehicles are in Appendix 2. The vehicles were used for transporting guests and documents among different campuses in Hong Kong Island and Kowloon as well as the Airport.

2.3 FIS has set up one dedicated 20A charger at the campus in Happy Valley. The EV was mainly charged using this charger. It took about 8 hours to fully charge the batteries. The EV was charged overnight after work.

3. Trial Information

3.1 The trial started on 1 November 2015 and will last for 24 months. FIS is 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. Similar data from the PV is also required. In addition to the cost information, reports on maintenance work, operational difficulties and opinions of the drivers and FIS were collected to reflect any problems of the EV.

3.2 The following table summarizes the statistical data of the EV and the PV. The average fuel cost of the EV is \$1.66/km (83.4%) lower than the PV.

Table 1: Key operation statistics of each vehicle (November 2015 to April 2016)

		EV	PV
Total mileage / km		4,131	1,517
Average fuel economy	(km/kWh)	4.05	-
	(km/litre)	-	7.12
	(km/MJ) ^[1]	1.27	0.22
Average fuel cost / (\$/km) ^[2]		0.33	1.99
Average total operating cost / (\$/km)		1.27	7.30
Downtime/ day ^[3,4]		2	1

^[1] Assuming lower heating value of 32MJ/litre for petrol.

^[2] Market rate was used for calculation.

^[3] Downtime refers to the equivalent number of working days in which the vehicle is not in operation due to charging, and the period 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] Maintenance due to incidents unrelated to the performance of the vehicle was not included for comparison.

3.3 Apart from the maintenance cost, other indirect costs might include towing fee, vehicle replacement fee and cost of operation downtime due to maintenance of the EV.

3.4 During the reporting period, there was an incident that the EV ran out of battery power and could not find any charging station at the airport on 24 January 2016. A towing service was required for towing the vehicle to the school campus at Happy Valley with the charges of HK\$1,200. One day of operation downtime was induced from this incident.

3.5 The EV was used more extensively and the total travelling mileage was 2.7 times of the PV.

3.6 Utilization rate of EV was 98.6% and the PV was 99.2%.

4. Summary

4.1 The average fuel cost of the EV was 83.4% (\$1.66/km) lower than the PV. The average total operating cost of the EV was 82.6% (\$6.03/km) lower than the PV. Utilization rate of EV was 98.6% and the PV was 99.2%.

4.2 FIS and the designated EV driver in general satisfied with the performance of EV and felt that the EV was quiet and environmentally friendly. The EV driver would prefer to use the EV when both vehicles were available.

4.3 With the bad experience of the dead battery at the airport in January 2016, FIS shared the view that the battery range would limit their scope of operations. They had started planning the better travelling route for the EV according to battery allowed range.

4.4 FIS shared the view that the cargo capacity of the EV is sufficient to support the daily work. Also, EV could save operating cost when compared with the PV.

4.5 Since there was no serious incident and deterioration on the parts of EV during this reporting period, FIS had no comment on the service performance from the manufacturer at this moment.

4.6 The charging frequency as well as average fuel economy of the EV did not indicate any deterioration in the battery performance.

Appendix 1: Key Features of Vehicles

1. Trial EV

Registration Mark	TR6967
Make:	Renault
Model:	Kangoo Van Z.E.
Class:	Light Goods Vehicle
Gross vehicle weight:	2.26 tonnes
Seating capacity:	Driver + 4 passengers
Rated power:	44 kW
Travel range:	170 km (air-conditioning off)
Maximum speed:	130 km/h
Battery Type:	Lithium ion
Batteries capacity:	22 kWh
Charging time:	8 hours (Max. current 16A)
Year of manufacture:	2015

2. PV for comparison

Registration Mark	JU9001
Make:	Toyota
Model:	SR40RGRSRKSD
Class:	Private Car
Seating capacity:	Driver + 7 passengers
Cylinder capacity:	1,998 c.c.
Year of manufacture:	2000

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV

	
EV Front View	EV Rear View
	
EV Left Side View	EV Right Side View
	
Charging Station for EV	

2. PV for Comparison



PV Front View



PV Rear View



PV Left Side View



PV Right Side View