

Pilot Green Transport Fund

Interim Report

On

Trial of Electric Van for University

(HKUST)

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PREPARED BY:

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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 Electric Van for University
(HKUST)**

**Interim Report
(Trial Period: 1 May – 31 October, 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 innovative transport technologies, contributing to better air quality and public health for Hong Kong. The Hong Kong University of Science and Technology (HKUST) was approved under the Fund for trial. Through the tendering procedures stipulated in the Subsidy Agreement HKUST entered into with the Government, HKUST procured one Nissan e-NV200 electric light goods vehicle (van type) (EV) for trial. According to the manufacturer, it has a travel range of 165 km with battery fully charged and air-conditioning off.

1.2 PolyU Technology and Consultancy Company Limited (PolyU) 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. HKUST assigned a diesel light goods vehicle (van type) (DV) providing same service as the conventional counterpart for comparing with the EV.

1.3 This Interim Report summarizes the performance of the 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 and photos of vehicles are provided in Appendix 1 and Appendix 2, respectively. The vehicles were used mainly for providing goods delivery service for HKUST facility management. In the first 6-month of the trial period, the average monthly mileage travelled by the EV was around 900 km.

2.2 HKUST has installed a standard charging facility (limited by 10-ampere) at LG 5 indoor car park on-campus to charge the batteries of the EV as well as to record the electricity consumed for EV charging. The EV was charged overnight every day (from 17:00 to 08:00 on the next day).

3. Trial Information

3.1 The trial commenced on 1 May 2016 and will last for 24 months. HKUST was required to collect and provide trial information including the EV mileage reading before charging, amount electricity consumed in each charging, time taken for charging, operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenance of the EV and the charging facilities. 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.

3.2 The following table summarizes the statistical data of the EV and DV.

Table 1: Key operation statistics of each vehicle (May – October, 2016)

		EV	DV
Total mileage (km)		5,401	4,233
Average fuel economy	(km/kWh)	3.12	-
	(km/litre)	-	5.04
	(km/MJ)	0.87	0.14 ^[1]
Average fuel cost (\$/km) ^[2]		0.36	2.18
Average total operating cost (\$/km)		0.36	2.18
Downtime (working day) ^[3]		0	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 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.

3.3 During the reporting period, the average fuel cost of EV was \$1.82/km (i.e. about 83%) lower than that of DV. The EV had no unscheduled or scheduled maintenance, therefore the average total operating cost of the EVs was same as the average fuel cost which was \$1.82/km (i.e. about 83%) lower than that of DV.

3.4 As there was no maintenance for the EV and DV during the reporting period, utilization rates were 100% for both EV and DV.

4. Summary

4.1 During the first six months of the trial, the average fuel cost of the EV was about 83% (\$1.82/km) lower than that of the DV. The average total operating cost of the EV was also about 83% (\$1.82/km) lower than that of the DV as no maintenance for EV was required in this period. In addition, utilization rates were 100% for both EV and DV as both had no unscheduled or scheduled maintenance.

4.2 The drivers had no problem in operating the EV and were satisfied with its performance.

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 the Vehicles Involved in the Trial

1. Trial EV






Registration mark	UA5744
Make:	Nissan
Model:	e-NV200
Class:	Light goods vehicle
Gross vehicle weight:	2.25 Tonnes
Seating capacity:	driver + 4 passengers
Rated power:	80 kW
Travel range:	165 km (air conditioning off)
Maximum speed:	over 120 km/h
Battery material:	lithium-ion
Battery capacity:	24 kWh
Year of manufacture:	2015

2. DV Used for Comparison

Registration mark	RD5020
Make:	Hyundai
Model:	H1 Van Standard
Class:	Light Goods Vehicle
Gross vehicle weight:	3.23 Tonnes
Seating capacity:	driver + 5 passengers
Cylinder capacity:	2,497 cc
Year of manufacture:	2011

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

 A silver Nissan EV van with license plate UA 5744 parked in a paved lot. The front view shows the car's headlights, grille, and front bumper. A timestamp '08/11/2016 16:12' is visible in the bottom right corner.	 The rear view of the silver van UA5744, showing the back window, rear door, and license plate. A timestamp '08/11/2016 16:12' is visible in the bottom right corner.
UA5744 – front view	UA5744 – end view
 A side profile view of the silver van UA5744 parked in a lot. The side of the van features logos and text in Chinese and English. A timestamp '08/11/2016 16:12' is visible in the bottom right corner.	 Another side profile view of the silver van UA5744, showing a different angle. A timestamp '08/11/2016 16:12' is visible in the bottom right corner.
UA5744 – side view 1	UA5744 – side view 2
 A close-up photograph of a white battery charging station mounted on a wall. It includes a watt-hour meter and a charging cable. A timestamp '08/11/2016 17:34' is visible in the bottom right corner.	
Battery charger with watt-hour meter	

2. DV for Comparison



RD5020 – front view



RD5020 – rear view



RD5020– side view 1



RD5020 – side view 2