Pilot Green Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle (Van Type) for University II
(The Hong Kong University of Science and Technology)

(27 April 2018)

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(Trial Period: 1 March – 31 August, 2017)

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 comparison.

1.3 This Interim Report summarizes the performance of the EV in the first six months of the trial as compared with its conventional 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 good delivery service for HKUST facility management. In the first 6-month of the trial period, the average monthly travel mileage of the EV was around 931 km.

2.2 HKUST has installed a standard charging facility (limited by 10-ampere) at their own cost 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 March 2017 and would last for 24 months. HKUST 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, operation downtime due to charging, cost and downtime associated with scheduled and unscheduled maintenance of the EV. Similar data of the DV were also required. In addition to the cost information, reports on maintenance work, maintenance works, 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 (March – August 2017)

		EV	**DV**
Total mileage (km)		5,584	2,657
Average fuel economy	(km/kWh)	3.26	-
	(km/litre)	-	4.31
	(km/MJ)	0.90	0.12 [1]
Average fuel cost ($/km) [2]		0.35	2.71
Average total operating cost per km ($/km)		0.35	2.71
Downtime (working day) [3]		5	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 the vehicle is not in operation, which is counted 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 $2.36/km (i.e. about 87%) lower than that of DV. The EV had undergone an unscheduled maintenance for 5 days from 27 April to 5 May 2017 due to battery charging failure. No maintenance cost was incurred as the EV was within warranty period. There was no maintenance for the DV. Therefore, the average total operating cost of the EV was same as the average fuel cost which was $2.36/km (i.e. about 87%) lower than that of DV.

3.4 The utilization rate of the EV was 96% as EV had undergone an unscheduled maintenance for 5 days while the utilization rate of the DV was 100% as there was no maintenance for the DV during the reporting period.

4. Summary

4.1 During the first six months of the trial, the average fuel cost of the EV was $2.36/km (i.e. about 87%) lower than that of the DV. The utilization rate of EV was 96% while that of DV was 100% as DV 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	**UN7292**
Make:	Nissan
Model:	e-NV200
Class:	Light goods vehicle (Van Type)
Gross vehicle weight:	2,250 kg
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	**PT8453**
Make:	Nissan
Model:	URVAN 3.0L DIESEL M/T HPV
Class:	Light Goods Vehicle (Van Type)
Gross vehicle weight:	3,300 kg
Seating capacity:	driver + 5 passengers
Cylinder capacity:	2,953 cc
Year of manufacture:	2011

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

UN7292 – front view

UN7292 – end view

UN7292 – side view 1

UN7292 – side view 2

Battery charger with watt-hour meter

2. DV for Comparison

	
PT8453 – front view	**PT8453 – rear view**
	
PT8453 – side view 1	**PT8453 – side view 2**