New Energy Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Sustainability Education
(World Wide Fund for Nature Hong Kong)

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Interim Report
(Trial Period: 1 February 2022 – 31 July 2022)

Executive Summary

1. Introduction

1.1 The New Energy 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. World Wide Fund for Nature Hong Kong (WWF) was approved under the Fund for trial of one electric light goods vehicle. Through the tendering procedures stipulated in the Agreement entered into with the Government, WWF procured one Nissan e-NV200, electric light goods vehicle (EV) for trial.

1.2 Hong Kong Productivity Council 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. WWF assigned a diesel light goods vehicle (DV) providing the same services 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 and Conventional Vehicles

2.1 The trial EV, Nissan e-NV200 electric light goods vehicle, has a gross vehicle weight (GVW) of 2,250 kg capable of carrying a driver with four passengers and goods. It has a 40 kWh Lithium-ion battery pack and the driving range of 317 km with its battery fully charged and air conditioning off. There is one designated driver assigned to drive the EV. The EV was used mainly for delivering organization documents between WWF's offices in Hong Kong.

2.2 The DV, Mercedes Benz Sprinter 315 CDI Half Panel Van diesel light goods vehicle with a GVW of 3,550 kg and a cylinder capacity of 2,148 c.c., was used as the conventional counterpart for comparison in this trial. Since the start of operation of the EV, the duty of the DV was replaced by the EV. Hence, the historical data of the DV were used for comparison in this report.

2.3 WWF has installed its own charging facility, including a 7.4 kW AC charger inside the office in Tai Po where the EV is normally parked overnight.

2.4 Key features of the EV and the DV as well as the EV charging facility are presented in Appendix 1. The photos of vehicles and the EV charging facility are shown in Appendix 2.

3. Trial Information

3.1 The trial commenced on 1 February 2022 and would last for 12 months. WWF was required to collect and provide trial information including the EV's 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 were collected 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 in the first six months of the trial period.

Table 1: Key operation statistics of each vehicle (1 February 2022 – 31 July 2022)

		EV	**DV (historical data)** [1]
Total distance travelled (km)		7,021	7,751
Average daily distance travelled (km/working day)		49	56
Average fuel economy	(km/kWh)	5.58	-
	(km/litre)	-	10.44
	(km/MJ)	1.55	0.29 [2]
Average fuel cost (HK$/km)		0.23 [3]	1.98 [4]
Average total operating cost (HK$/km)		0.23	3.48
Downtime (working day) [5]		0	6

[1] Based on the historical data from 1 May 2020 to 31 October 2020.
[2] Assuming lower heating value of 36.13 MJ/litre for diesel fuel.
[3] Electricity cost was based on HK$1.289/kWh for 2022.
[4] The market fuel prices from 1 February 2022 to 31 July 2022 were used for calculation.
[5] Downtime refers to the working days that 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.

4.2. During the six months of the trial, there were 144 working days. The total distance travelled and the average daily distance travelled of the EV were 7,021 km and 49 km/day, respectively while those of the DV were 7,751 km and 56 km/day, respectively. The average fuel cost of the EV was HK$1.75/km (about 88%) lower than that of the DV. Taking the maintenance fee for both the EV and the DV into account, the average total operating cost of the EV was HK$3.25/km (about 93%) lower than that of the DV.

4.3 The EV had no maintenance while the DV had 1 scheduled maintenance in the first six months of the trial period. The EV had no maintenance related downtime while the DV had 6 days of maintenance related downtime. Therefore, the utilization rates of the EV and the DV were 100% and 95.8%, respectively.

4.4 The driver was satisfied with the EV performance.

5. Summary

5.1 In the first six months of the trial, the average daily mileage of the EV was 49 km, while that of the DV was 56 km.

5.2 The average fuel cost of the EV was HK$1.75/km (about 88%) lower than that of the DV. The average total operating cost of the EV was HK$3.25/km (about 93%) lower than that of the DV, taking the maintenance fee for both the EV and the DV into account.

5.3 The utilization rates of the EV and the DV were 100% and 95.8% respectively.

5.4 The driver of the EV was satisfied with the EV performance.

5.5 The findings only reflect the performance of the EV in the first 6 months of the trial. The performance and reliability of the EV will be continuously monitored in the 12 months of the trial.

Appendix 1: Key Features of the Vehicles and Charging Facility

1. Trial EV and Charging Facility

EV

Registration mark:	**XT6441**
Make:	Nissan
Model:	e-NV200
Class:	Light goods vehicle
Gross vehicle weight:	2,250 kg
Seating capacity:	Driver + 4 passengers
Rated power:	80 kW
Travel range:	317 km (air conditioning off)
Battery material:	Lithium-ion
Battery capacity:	40 kWh
Year of manufacture:	2020

EV Charging Facility (At Subsidy Recipient's own cost)

Make:	EV Power
Model:	EVC-32NK
Power:	7.4 kW, 220V AC / max 32A
Charging standard:	IEC 62196-2 Type 2

2. DV Used for Comparison

Registration mark	**NP8332**
Make:	Mercedes Benz
Model:	Sprinter 315 CDI Half Panel Van
Class:	Light goods vehicle
Gross vehicle weight:	3,550 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,148 c.c.
Year of manufacture:	2008

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV and Charging Facility

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<tr><td>Front view of EV</td><td>Rear view of EV</td></tr>
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<tr><td>Left side view of EV</td><td>Right side view of EV</td></tr>
<tr><td> 
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<tr><td>7.4 kW AC charging facility
(At Subsidy Recipient’s own cost)</td><td></td></tr>
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2. DV for Comparison

	
Front view of DV	Rear view of DV
	
Left side view of DV	Right side view of DV