New Energy Transport Fund

Interim Report
On
Trial of Electric Light Goods Vehicle for Container Operation
(Hongkong International Terminals Limited)

(8 June 2022)

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Interim Report
(Trial Period: 1 December 2021 – 31 May 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. Hongkong International Terminals Limited (HIT) was approved under the Fund for trial of one electric light goods vehicle. Through the tendering procedures stipulated in the Subsidy Agreement entered into with the Government, HIT procured one Nissan eNV200, electric light goods vehicle (EV) for trial.

1.2 PolyU Technology and Consultancy Company Limited has 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 vehicle. HIT assigned a diesel light goods vehicle (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 and Conventional Vehicles

2.1 The trial EV, Nissan eNV200 electric light goods vehicle, has a gross vehicle weight 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 is 317 km with air-conditioning off. No designated driver used the EV. The DV, Nissan NV350 URVAN 2.5L DIESEL A/T HALFT PANEL VAN (LGV) LUX 2,488 c.c. diesel light goods vehicle, was used as the conventional counterpart for comparison in this trial. The vehicles were used mainly for delivering company documents and maintenance parts among the Terminals 4, 6, 7 and 9 in the Kwai Tsing container port areas.

2.2 HIT has installed a 7.4 kW, single phase AC charger at its own cost for charging the EV. Key features of the EV and the DV as well as the EV charging facility (at the recipient's own cost) 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 December 2021 and would last for 12 months. HIT was required to collect and provide trial information including the EV 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 and provided 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.

Table 1: Key operation statistics of each vehicle (1 December 2021 – 31 May 2022)

		EV	**DV**
Total mileage (km)		3,978	2,300
Average daily mileage (km/working day)		22	13
Average fuel economy	(km/kWh)	3.85	-
	(km/litre)	-	6.03
	(km/MJ)	1.07	0.17 [1]
Average fuel cost (HK$/km) [2]		0.33	3.21
Average total operating cost (HK$/km)		0.33	3.21
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 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 6 months of the trial, there were 182 working days. The total distance traveled and the average daily distance traveled of the EV were 3,978 km and 22 km/day, respectively while those of the DV were 2,300 km and 13 km/day, respectively. The average fuel cost of the EV was HK$2.88/km (i.e. about 90%) lower than that of the DV. Taking maintenance fee for both the EV and the DV into account, the average total operating cost of the EV was also HK$2.88/km (i.e. about 90%) lower than that of the DV, as no maintenance was required for the EV and the DV.

4.3 The EV and the DV had no maintenance, therefore, the utilization rates of both the EV and the DV were 100%.

5. Summary

5.1 In the first six months of the trial, the average daily mileage of the EV was 22 km, while that of the DV was 13 km.

5.2 Both the average fuel cost and the average total operating cost of the EV were HK$2.88/km (i.e. about 90%) lower than those of the DV, as no maintenance was required for the EV and the DV.

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

5.4 The drivers of the EV had no problem in operating the vehicle.

5.5 The findings only reflect the performance of the EV in the first six 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 Vehicles and Charging Facility

1. Trial EV and Charging Facility

(a) EV

Registration mark:	**XR7222**
Make:	Nissan
Model:	e-NV200 Van (LGV)
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

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

Make:	Wallbox
Model:	PLP1-0-1-2-3-001-A
Power:	7.4 kW, single phase AC
Charging standard:	IEC 61851-1
Weight:	5 kg
Year of manufacture:	2021

2. DV Used for Comparison

Registration mark	**VE3465**
Make:	Nissan
Model:	NV350 URVAN 2.5L DIESEL A/T HALFT PANEL VAN (LGV) LUX
Class:	Light goods vehicle
Gross vehicle weight:	3,300 kg
Seating capacity:	Driver + 5 passengers
Cylinder capacity:	2,488 cc
Year of manufacture:	2017

Appendix 2: Photos of Vehicles and Charging Facility

1. Trial EV (XR7222) and Charging Facility

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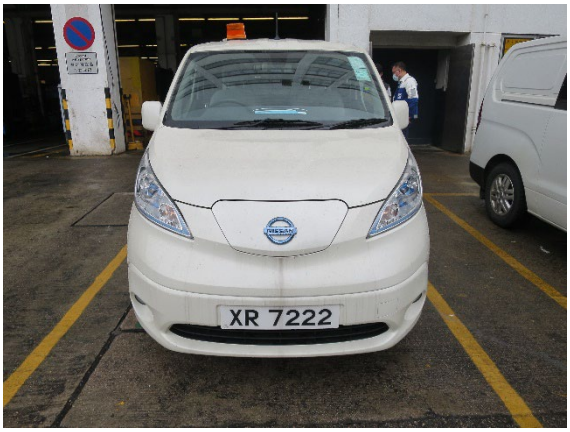
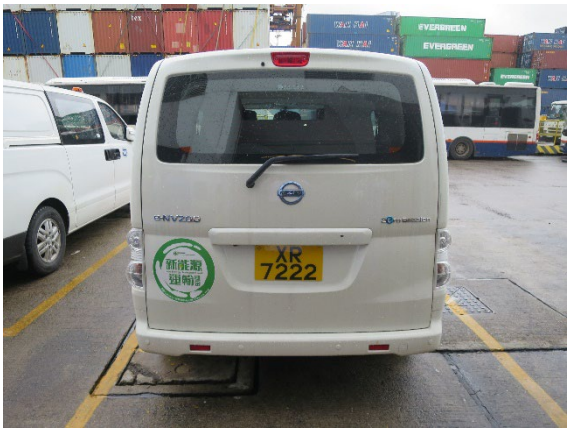
<tr><td> 
</td><td> 
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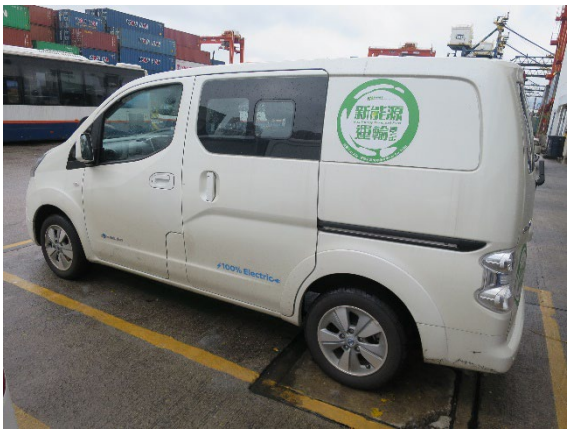
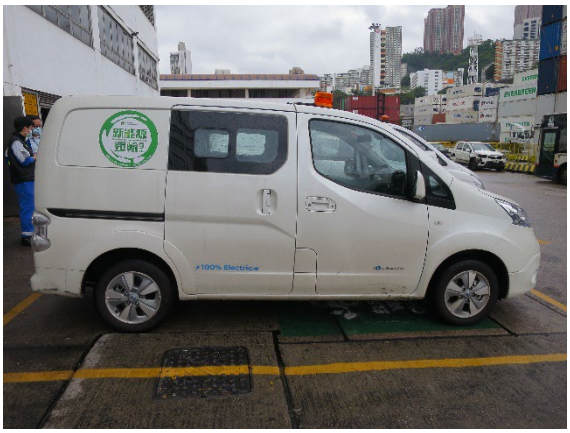
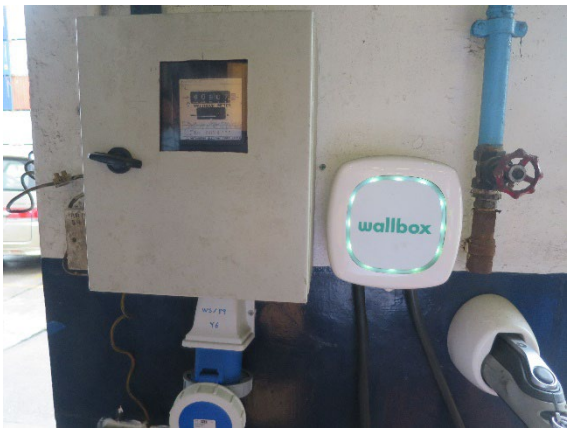
<tr><td>Front view of EV</td><td>Rear view of EV</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Left side view of EV</td><td>Right side view of EV</td></tr>
<tr><td> 
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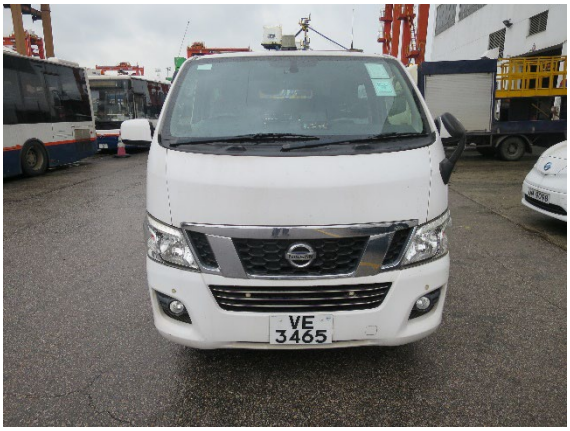
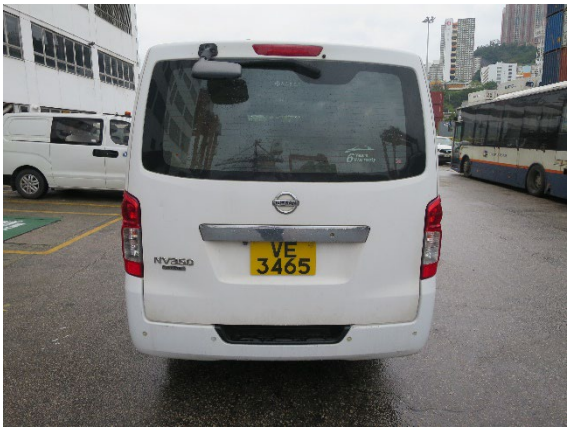
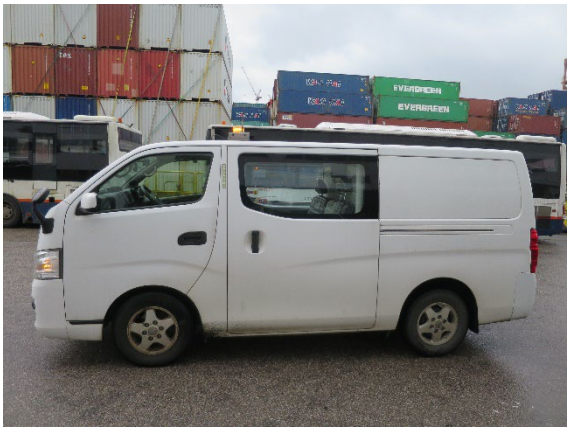
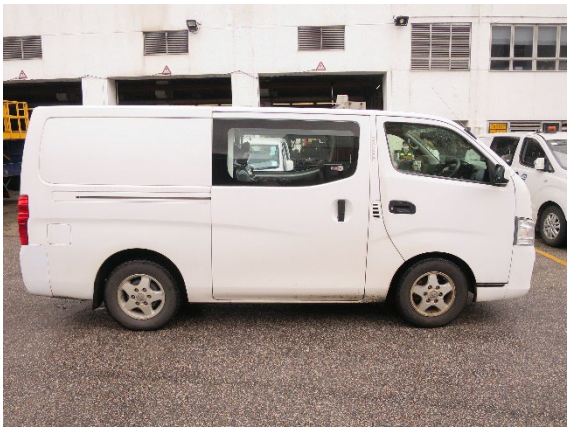
<tr><td>7.4 kW AC charging facility
(At Recipient’s own cost)</td><td></td></tr>
</table>

2. DV (VE3465) for Comparison

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