

**For discussion on
21 July 2015**

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

Progress Report on the Pilot Green Transport Fund

PURPOSE

This paper updates Members on the progress of the Pilot Green Transport Fund (the Fund) which supports the testing of green and innovative technologies in the public and goods transport sectors.

BACKGROUND

2. The local transport sector, including vehicles and vessels, is the largest local emission source ^[1] for nitrogen oxides and respirable suspended particulates. Promoting a wider use of green transport technologies could help improve air quality, protect public health and combat climate change. To this end, the Fund was set up in March 2011 with \$300 million to encourage the public transport sector and non-profit organizations to test out green and innovative technologies in respect of air pollutant emissions and/or carbon footprint. The Fund is applicable to ferries, taxis, public light buses, franchised buses and non-franchised public buses, and goods vehicles. The eligibility criteria and subsidy levels of the Fund are set out at **Annexes A and B** respectively.

3. The Fund is administered by the Environmental Protection Department (EPD). Given the diversity and continuous evolvement of technologies, a steering committee

¹ Based on the 2013 Hong Kong air pollutants emission inventory published in June 2015, vehicles and local vessels accounted for about 40% of the total nitrogen oxide and 30% of the total respirable suspended particulate emissions in Hong Kong.

has been set up to advise the Government on the applications for funding. The steering committee is currently chaired by Prof. Timothy Tong, President of the Hong Kong Polytechnic University, and includes members from academic institutions, transport trades and the relevant government departments. The membership list of the steering committee is at **Annex C**.

PROGRESS

4. As at end of June 2015, the Fund approved 92 projects involving the trials of 8 electric taxis, three electric light buses, 11 electric buses, 44 electric goods vehicles, 65 hybrid goods vehicles, 12 hybrid light buses, one set of solar air-conditioning system, four electric inverter air-conditioning systems, the replacement of four bus engines with more advanced models, and the adoption of a diesel-electric propulsion system and a seawater scrubber in a ferry. The total subsidy involved is about \$96 million. The approved projects will go through a trial period of one to two years. Details of the trials are set out in **Annex D**.

5. EPD has engaged independent third-party assessors to monitor and evaluate the operational performance of the green technologies as compared with that of their conventional counterparts. Fund recipients need to provide data regularly to the assessors who will submit progress reports on a six-month interval and a final report after the trial is completed.

6. At present, four hybrid public light buses, three electric taxis, eight electric buses, 23 electric goods vehicles, eight hybrid goods vehicles and one solar air-conditioning system subsidized by the Fund are on trial. Nine electric vans, 12 hybrid light goods vehicles and nine hybrid medium goods vehicles have already completed their two-year trials. So far, 27 interim and final reports involving the trial of 24 electric vehicles, 25 hybrid goods vehicles and one solar air-conditioning system have been uploaded to EPD's webpage^[2] for public reference. The trials showed that electric vehicles and hybrid vehicles in general can meet local operating conditions and incur less fuel cost than their conventional vehicles. The solar air-conditioning

² http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/pilot_green_transport_fund.html

system also has a fuel saving as compared with conventional air conditioner. A summary of performance of the products being tested is at **Annex E**.

PROMOTION AND PUBLICITY

7. To encourage the transport trade and other organizations to make use of the Fund, we have organized several workshops to brief the trades about the operation of the Fund as well as for Fund recipients to share their experience in the trial of electric and hybrid vehicles. The technology suppliers also have the opportunity to showcase their products and answer enquiries from potential users.

8. We are organizing another briefing session at the end of July 2015, focusing on electric vans. Efforts will be made to continue encouraging more sectors to make use of the Fund to try out green and innovative transport technologies.

GREEN INNOVATIVE TECHNOLOGIES

9. Since the launch of the Fund, commercial vehicle manufacturers are more willing to put on the local market their electric and hybrid vehicles. As at end of June 2015, 19 commercial vehicle models have been type-approved here (see **Annex F** for details). Other newly introduced green innovative technologies include retrofitting solar air-conditioning system and inverter air-conditioning systems for vehicles, the replacement of bus engines with environment-friendly engines, and retrofitting a ferry with a diesel-electric propulsion system and an exhaust gas scrubber.

10. These new green transport technologies have fuel saving potential. However, the transport trades have hesitation to use these technologies because of their high capital cost and uncertainties of their performance. The Fund can help overcome their worries through trying out the new technologies in local conditions. We now have applicants coming from a wide range of businesses including companies from logistics sector, construction sector, public transport operators, non-profit organizations, schools and universities etc.

ADVICE SOUGHT

11. Members are invited to note the above latest progress of the Fund.

Environmental Protection Department

July 2015

Eligibility Criteria of the Pilot Green Transport Fund

An applicant must be an existing transport operator based in Hong Kong (including cross-boundary transport) who:

1. operates ferries, taxis, public light buses, vehicles of charitable / non-profit making organizations providing services to their clients, franchised buses and non-franchised public buses, or goods vehicles (including special purpose vehicles);
2. has been in the relevant transport service for more than one year;
3. will likely remain in the service after the trial to bear fruit;
4. has the potential to put the new technology under test into wider use in its own operation upon successful trial;
5. is willing to share the findings of the test with other operators; and
6. is not receiving or has not received funding from other Government sources, public bodies or charitable organizations for the same purpose of the application, except the incentive scheme to encourage the early replacement of Euro II diesel commercial vehicles and the tax incentive scheme to encourage the use of environment-friendly commercial vehicles.

Subsidy Levels of the Pilot Green Transport Fund

The Fund subsidizes the capital cost of the green and innovative technology product proposed for trial but not the associated recurrent expenditure. The subsidy levels of various technologies for trial are set out in the table below.

An applicant can submit more than one application to try out different technologies (e.g. a public light bus operator to try both hybrid vehicles and electric vehicles) or to test products from different suppliers for the same technology under the same application to compare performance subject to the caps in the Table. A transport operator is, however, subject to an upper limit of **\$12 million** in total subsidy.

Table: Levels of subsidy for various technologies

Green and innovative technology product	Subsidy level	Subsidy cap
(a) <u>Alternative-fueled vehicles</u>		
(i) Subsidy per vehicle	(1) Price premium between the alternative-fueled and the conventional vehicle or 50% of the cost of the alternative-fueled vehicle, whichever is higher	\$3 million per vehicle and \$9 million per application
(ii) Related support systems	(2) 50% of setting up cost	
(b) <u>Conventional vehicles</u>		
(i) After-treatment emission reduction devices;	75% of the cost of the device including installation or the vehicle conversion cost	\$1.5 million per device or vehicle conversion, and \$9 million per application
(ii) Fuel saving devices; or		
(iii) Conversion of in-use conventional vehicles to alternative-fueled vehicles		
(c) <u>Ferries</u>		
Engine retrofit or testing of alternative-fueled engine	75% of the device or engine including installation	\$3 million per engine or device, and \$9 million per application

As technology continues to develop, innovative products other than the above categories may also be available for trial by the transport trades. Such applications will be considered on a case-by-case basis.

Membership of Pilot Green Transport Fund Steering Committee

Chairman	Professor Timothy W. Tong, JP
Members	Dr Lawrence Chan Wan-ching Mr Benny Chu Kwok-ki Dr Jackson Ho Yee-tak, MH Mr Leung Kun-kuen Professor Dennis Leung Yiu-cheong Mr Ling Chi-keung Mrs Agnes Mak Tang Pik-yee, MH, JP Mr Wilson Mok Yu-sang Mr Ng Kwan-sing Mr Matthew Wong Leung-pak Representative of Environmental Protection Department Representative of Innovation and Technology Commission Representative of Transport Department Representative of Electrical and Mechanical Services Department

Projects under the Pilot Green Transport Fund

(a) Completed projects

No.	Fund Recipient	Trial Products
1	Federal Express (Hong Kong) Limited	3 electric van type light goods vehicles
2	TNT Express Worldwide (HK) Limited	2 electric van type light goods vehicles
3	Chi Shing Transportation Company	1 electric van type light goods vehicle
4	Kwai Bon Transportation Limited	3 hybrid light goods vehicles
5	A. S. Watson Group (HK) Limited	1 hybrid light goods vehicle
6	MTR Corporation Limited	1 hybrid light goods vehicle
7	Kerry Distribution (Hong Kong) Limited	3 hybrid medium goods vehicles
8	Hong Kong Automobile Association	1 electric van type light goods vehicle
9	On Mei Tak Environmental Technology Limited	3 hybrid medium goods vehicles
10	Swire Beverages Limited	3 hybrid light goods vehicles
11	Swire Beverages Limited	3 hybrid medium goods vehicles
12	UPS Parcel Delivery Service Limited	2 hybrid light goods vehicles
13	Shun Hing Logistics Company Limited	2 hybrid light goods vehicles
14	Kwoon Chung Motors Company Limited	2 electric van type light goods vehicles

(b) On-going projects

No.	Fund Recipient	Trial Products
15	The Chinese University of Hong Kong	2 electric buses
16	The Chinese University of Hong Kong	2 electric van type light goods vehicles
17	Kwoon Chung Motors Company Limited	2 electric buses
18	International Trademart Company Limited	2 electric buses
19	S.F. Express (Hong Kong) Limited	3 hybrid light goods vehicles
20	Yan Yan Motors Limited	2 hybrid light buses
21	Teamwise Corporation Limited	2 hybrid light buses
22	Hong Kong Metropolitan Bus Limited	1 hybrid light bus
23	Sunny Engineering Company	1 electric taxi
24	Shu Sang Taxi Company	2 electric taxis
25	Lai Sun Motors Company Limited	1 electric taxi
26	Discovery Bay Transit Services Limited	2 electric buses
27	Gate Gourmet Hong Kong Limited	1 electric van type light goods vehicle
28	Chun Dak Engineering (HK-Macau) Company	1 electric van type light goods vehicle

No.	Fund Recipient	Trial Products
	Limited	
29	CM Geotechnics Limited	1 electric van type light goods vehicle
30	BioCycle (Hong Kong) Limited	2 electric van type light goods vehicles
31	New Method Cleaning Services Limited	1 electric van type light goods vehicle
32	Hong Kong Science and Technology Parks Corporation	1 solar air-conditioning system
33	Hong Kong International School Association Limited	1 electric van type light goods vehicle
34	C & C Logistic Services Company Limited	1 electric van type light goods vehicle
35	Ray Ray Limited	1 electric van type light goods vehicle
36	Swire Beverages Limited	2 electric van type light goods vehicles
37	Mak Hang Kei (Hong Kong) Construction Limited	2 electric van type light goods vehicles
38	Geotech Engineering Limited	2 electric van type light goods vehicles
39	Kam Lung Trading Co	1 hybrid light goods vehicle
40	Airport Authority Hong Kong	3 electric van type light goods vehicles
41	DHL Express (Hong Kong) Limited	1 electric van type light goods vehicle
42	DKSH Hong Kong Limited	1 hybrid light goods vehicle
43	DKSH Hong Kong Limited	2 hybrid medium goods vehicles
44	Cathay Pacific Catering Services (H.K.) Limited	1 electric van type light goods vehicle
45	Vegetable Marketing Organization	1 electric van type light goods vehicle
46	E. Tech Management (HK) Limited	1 hybrid light goods vehicle

(c) Projects under preparation

No.	Fund Recipient	Trial Products
47	Good Funds Services Limited	2 electric buses
48	Sun Bus Limited	1 electric bus
49	Glory Success Transportation Limited	3 hybrid light buses
50	Hong Kong & China Transportation Consultants Limited	3 hybrid light buses
51	Big Three Limited	1 hybrid light bus
52	Kwok Kin Air Condition & Electrical Work Company Limited	1 electric van type light goods vehicle
53	Hotel ICON Limited	2 electric light buses
54	The Kowloon Motor Bus Company (1933)	4 buses engines retrofit

No.	Fund Recipient	Trial Products
	Limited	
55	Welcome Construction Company Limited	3 hybrid light goods vehicles
56	Welcome Construction Company Limited	3 hybrid medium goods vehicles
57	China Prosper Engineering Limited	3 hybrid light goods vehicles
58	China Prosper Engineering Limited	3 hybrid medium goods vehicles
59	Ecospace Limited	1 hybrid light goods vehicle
60	Ecospace Limited	1 hybrid medium goods vehicle
61	Mak Hang Kei (Hong Kong) Construction Limited	3 hybrid medium goods vehicles
62	The "Star" Ferry Company Limited	1 diesel-electric propulsion system
63	The "Star" Ferry Company Limited	1 seawater scrubber
64	Kau Kee Hong Kong Limited	1 electric van type light goods vehicle
65	K. C. Dat Limited	1 hybrid light goods vehicle
66	Jinda International Holdings Limited	2 electric taxis
67	Suen Po Yee Taxi Co.	2 electric taxis
68	Cheer Honest Industrial Limited	2 electric taxis
69	Green Mobility Innovations Limited	1 electric van type light goods vehicle
70	DKSH Hong Kong Limited	1 hybrid light goods vehicle
71	French International School "Victor Segalen" Association Limited	1 electric van type light goods vehicle
72	LF Logistics (Hong Kong) Limited	1 electric van type light goods vehicle
73	Waste & Environmental Technologies Limited	1 electric van type light goods vehicle
74	YKK Hong Kong Limited	1 hybrid medium goods vehicle
75	Tong Kee Engineering Limited	1 electric van type light goods vehicle
76	The Hong Kong Polytechnic University	1 electric light bus
77	New Method Cleaning Services Limited	1 electric van type light goods vehicle
78	Tak Cheong Loong Company Limited	1 electric van type light goods vehicle
79	Hong Kong Yakult Company, Limited	3 hybrid light goods vehicles
80	Express Tourist Bus Company Limited	1 electric inverter air-conditioning system
81	Jackson Coach Hire Service Limited	2 electric inverter air-conditioning systems
82	Fullbond Transportation Limited	1 electric van type light goods vehicle
83	Total Van Limited	1 electric van type light goods vehicle
84	DHL Express (Hong Kong) Limited	2 hybrid light goods vehicles
85	DHL Express (Hong Kong) Limited	1 hybrid medium goods vehicle

No.	Fund Recipient	Trial Products
86	Tong Shun Hing Poultry (HK) Co., Limited	3 hybrid medium goods vehicles
87	Tong Kiu Traffic Services Limited	1 electric inverter air-conditioning system
88	Lung Wai Air-Conditioner & Electrical Engineering Co	1 electric van type light goods vehicle
89	Atta-Trans Limited	3 hybrid light goods vehicles
90	Atta-Trans Limited	1 hybrid medium goods vehicle
91	Hoi Tong Logistics (H.K.) Limited	1 hybrid light goods vehicle
92	Hoi Tong Logistics (H.K.) Limited	2 hybrid medium goods vehicles

Summary of Trial Reports

Electric vehicles

1. Similar to conventional vehicles, electric vehicles' fuel economy varied with their usage and their utilization rates were related to the level of support available locally.
2. Compared with conventional vehicles, the fuel cost per kilometre of electric vehicles was 30% to 80% lower.
3. The drivers had no problem using electric vehicles although some needed to adapt their operation to suit vehicles' performance, e.g. limited travel range.
4. In general, the utilization rates of the two types of vehicles were similar.
5. **Electric vans** were capable of providing the same level of services previously provided by conventional vans for cases that did not require high mileage travel,
6. **Electric taxis'** drivers found that the charging time was too long and more charging facilities were needed to support their operation.
7. **Electric buses** could be used for shuttle services in place of diesel buses provided their design took into account the specific demand of the routes to be served.

Hybrid vehicles

1. Similar to conventional vehicles, the fuel economy of the hybrid vehicles varied with their usage.
2. Hybrid vehicles could meet the local operating requirements.
3. Compared with conventional vehicles of similar configurations, the fuel cost per kilometre of hybrid vehicles was about 10% lower. Fuel savings would be more significant if the operation involved frequent starting and stopping as well as low speed travel.
4. The drivers had no problem in using hybrid vehicles although some felt their hill climbing ability was not as good as their conventional counterparts.
5. The utilization rates of hybrid and conventional goods vehicles were similar. Hybrid light bus needed frequent repair and fine-tuned - mainly related to its battery management system.
6. **Hybrid light bus'** drivers and passengers sometimes found its engine noisy when the engine was charging.
7. **Hybrid light bus** had larger turning circle that could make tight turning difficult as compared with the conventional light bus.

Solar air-conditioning system

1. Compared with a similar bus that used a conventional air-conditioning system, the trial bus had better fuel economy, resulting in 8% lower fuel cost.

**Alternative-fueled Commercial Vehicle Models Type
approved by the Transport Department**

Electric Vehicles

Vehicle class	Model
Light goods vehicle	Smith Edison Panel Van
	Micro-Vett Electric Doblo
	Renault Kangoo Van Z.E.
	Mitsubishi Minicab MiEV
	Nissan e-NV200
Medium goods vehicle	Smith Newton
Taxi	BYD e6
Bus	Shandong Yixing Great Dragon
	Shandong Yixing Feiyan
	Wuzhoulong FDG6102EVG
	Wuzhoulong FDG6110EV2
	BYD K9D
Light bus	Smith Edison

Hybrid Vehicles

Vehicle class	Model
Light goods vehicle	Mitsubishi Fuso Canter Eco Hybrid 5.5t
	Hino 300 Series Hybrid 5.5t
Medium goods vehicle	Mitsubishi Fuso Canter Eco Hybrid 7.5t
	Hino 300 Series Hybrid 8.5t
Taxi	Toyota Prius
Light bus	Dongfeng Gemini