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Hong Kong's First Commercial-scale Standalone Renewable Energy System Completes on Town Island

CLP Expects to Reduce Annual CO₂ Emissions by 70,000 kg

The Hong Kong's first commercial-scale standalone renewable energy (RE) generation and storage system is now near to completion on Town Island. The system, started planning by CLP in 2008, includes 672 solar panels, 2 wind turbines and 576 batteries. With an installed generating capacity up to 192 kW, which is capable of lighting up 9,600 compact fluorescent lamps, the System will be able to meet the power needs of the island's drug rehabilitation centre and its future development. CLP anticipates that this "zero emission" system can save an estimated 70,000 kg of carbon dioxide (CO₂) emissions per year, equivalent to the amount absorbed by 3,500 trees in the same period.

The two-phase Town Island power supply project took four years to complete. Involving 100 solar panels, the first phase was commissioned in January 2010 and had generated more than 37,000 kWh of electricity and reduced CO₂ emissions by over 21,000 kg as of the end of September 2012. The second phase, to be completed at the end of this month, will take the size of the facility to 672 solar panels and two wind turbines to power the Town Island Redevelopment Programme. Expected to be commenced at the end of the year, the redevelopment will include the building of new hostels and sewage treatment facilities.

Considering the increase of the proportion of cleaner fuels in CLP's generation portfolio, Mr Chow Tang Fai, CLP Power Director – Power Systems, said, "CLP has been optimising its power generation portfolio with the use of cleaner energy like bringing in natural gas and nuclear in the 90s for better air quality. We are also committed to exploring RE opportunities in Hong Kong. In addition to the Town Island project, we are studying the feasibility of developing an offshore wind farm in the southeastern waters of Hong Kong. We have also connected over 110 small RE systems to the CLP grid since 2003. By the third quarter of this year, the total generating capacity of these RE systems has reached 3.6 MW."

The development of RE depends on a number of environmental factors. Town Island has expansive open space for accommodating solar panels while the absence of tall buildings facilitates the absorption of sunlight. Furthermore, rich in wind resources also enables the island to make wind power generation possible. This project is more cost-effective than the traditional supply methods of overhead lines and submarine cables, with the added benefit of maintaining the area's natural scenery and marine ecology.

Since the RE system on Town Island is the first-of-its-kind in Hong Kong, there are no relevant data or experience to refer to and the engineering team has to overcome many challenges to complete the project, as remarked by Mr Chow. Considering that the system is not grid-connected, the amount of electricity consumed must be calculated with great accuracy. To ensure an uninterrupted supply of electricity for the island, the RE system is equipped with batteries capable of storing over 1,000 kWh of electricity to supply power for around 30 hours. On days of patchy sunlight, the two wind turbines can also provide additional electric power.

The island's remote location and the lack of a suitable pier on the island make the transport of supplies very challenging. In addition, changes in weather conditions on the island can be quite drastic, and the design and choice of materials has to take into account the fact that the system may be exposed to a harsher climate than in urban areas.

Operation DAWN Hong Kong has been operating a drug rehabilitation centre on the island since 1976. The Centre used to rely on power generated by three diesel generators that would function intermittently between six to eight hours a day. Transportation of fuel by sea was also costly and time consuming. Mrs Mamre Lilian Yeh, General Secretary of Operation DAWN Hong Kong, said, "Since the installation of the RE system, we no longer have to bear with the noise and air pollution from burning oil for electricity generation. The island has been enjoying a 24-hour uninterrupted electricity supply since then, contributing to a marked improvement in the quality of life of our residents."

Without precedent, the Town Island project provides the industry as well as the academia with critical data and field experience of utilising RE in Hong Kong. CLP is currently working with The University of Hong Kong and The Hong Kong Polytechnic University on researching and analysing the operation data of the Town Island system so to further look into the applicability of RE in the territory.

In addition to supplying electricity, CLP also supports Operation DAWN through various means. CLP volunteers not only spent their spare time to conduct health check for electrical installations on island, but also provided customised electrical training for the rehabilitants there. To supplement the good efforts of its employees, CLP introduced the "CLP-Operation Dawn Electrical Studies Incentive Programme" to encourage rehabilitants to pursue further study in electrical engineering and register as an electrical worker, so as to equip them with skills for reintegration to society after rehabilitation. In 2011, CLP sponsored an orienteering game on the island, raising more than HK\$300,000 for Operation DAWN's redevelopment plan.

About CLP Power Hong Kong Limited

CLP Power Hong Kong Limited ("CLP Power") is the Hong Kong utility subsidiary wholly owned by CLP Holdings Limited, a company listed on the Hong Kong Stock Exchange and one of the largest investor-owned power businesses in Asia. CLP Power operates a vertically integrated electricity supply business in Hong Kong, and provides a highly reliable supply of electricity and excellent customer services to 5.7 million people in its supply area.

Photo Captions



The Hong Kong's first commercial-scale standalone renewable energy (RE) generation and storage system on Town Island includes 672 solar panels and 2 wind turbines. Mr. Chow Tang Fai, CLP Power Director – Power Systems, shows the difference between the solar panels used for the first phase (right hand in the picture) and the second phase project (left hand). With the larger generation capacity of solar panels used, the required number of solar panels and area for installation can be reduced.



Mr. Chow Tang Fai, CLP Power Director – Power Systems, introduces the two-phased Town Island Power Supply Project. Against the backdrop is the Mount Carmel site where 456 PV Panels and 1 wind turbine were installed, with a generation capacity up to 126kW.



Mr. Chow Tang Fai, CLP Power Director – Power Systems and Mrs Mamre Lilian Yeh, General Secretary of Operation DAWN Hong Kong jointly activate a 6kW wind turbine, marking the formal completion of the Town Island Power Supply Project.

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For media enquiries, please contact:

Ms. Emmy Lee
Public Affairs Manager—Power Systems
CLP Power Hong Kong Limited
Tel: (852) 2678 6434
Pager: (852) 71163131 a/c 8686
Email: emmylee@clp.com.hk