

# Session Keynote: Development of Renewable Energy Projects in Hong Kong - Hongkong Electric's Experience

## 在香港開發可再生能源項目 - 香港電燈的經驗

**Mr Frank F H LAU**

General Manager (Projects)

The Hongkong Electric Co., Ltd.

### Abstract

In support of Government's sustainable development policy to have 1 to 2% renewable energy of the total power generation in HK, HK Electric has been embarking on developing renewable energy projects in recent years, mainly concentrating on wind and solar energies.

#### Offshore Wind Farm

Due to lack of land and wind resources for developing sizable onshore wind farms in HK, the study focus turned to identifying a suitable site within the territorial waters in HK for developing an offshore wind farm. A comprehensive site search and EIA study have been carried out since 2006.

8 short-listed sites have been identified. Among these short-listed sites, the offshore site at about 4 km southwest of Lamma Island is identified as the preferred site judging from the fact that the overall environmental impact is the lowest. There are also other technical merits of the SW Lamma site, including shallower water depth and shorter transmission cables linking to Lamma Power Station compared with other potential sites on the eastern waters of HK. Besides, the existing Lamma Power Station can offer land and other logistic supports for pre-assembly of large wind turbine components during construction phase of the project.

The planned capacity of the offshore wind farm is about 100 MW, comprising 28 to 35 numbers of wind turbines of unit capacity ranging between 2.3 to 3.6 MW. The site boundary occupies an area of about 600 ha. The estimated annual generation from the wind farm is about 1.7 GWh, which is about 1.6% of the total generation of HK Electric system in 2009, and is adequate for consumption of 50,000 families.

HK Electric plans to commission the offshore wind farm by the year 2015.

#### Solar Power System

In 2009, HK Electric signed a contract with Du Pont Apollo Limited to adopt its amorphous silicon thin film PV panels manufactured in Shenzhen for conversion of solar energy to electricity. Capacity of the PV system is 550 kW, comprising a total of 5,500 panels each of 100W peak capacity. These panels are laid on the station building roofs of Lamma Power Station and have just been commissioned in July 2010. The estimated annual capacity factor is about 12.9%, and the system output is about 620,000kWh p.a., which should be adequate to support the energy consumption of 150 families. This is currently the largest PV system in HK.

HK Electric has further plans to install more of the PV panels such that by 2012 the total capacity of solar power system can reach to 1MW.

### 摘要

港燈支持政府可持續發展的政策，在幾年前已積極研究開發可再生能源項目，以達致政府所定的佔整體發電量1至2%的政策目標，重點研究開發風能和太陽能項目。

#### 離岸風場

由於香港受陸地資源和風力的限制，開發大型陸上風場並不可行。港燈於是將焦點轉向海上，在香港的水域內尋找適合開發離岸風場的地點。詳細的選址和環評研究，在2006年正式展開。

選址研究初步在香港水域內篩選出八個可能選址，經過詳細的分析比較後，確定在南丫島西南約4公里的海面，是最為適合的選址，因為該地點的整體環境影響最低，而且技術條件較為優越，包括水深較其他在東部水域的選址淺，輸電往南丫電廠的電纜也較短。其次，在建設期間可利用南丫電廠作後勤支援，包括利用現有的空地，為風電機進行預組裝。

離岸風場的規劃容量為100兆瓦，由約28至35枝單機容量為2.3-3.6兆瓦的風電機組成。風場邊界內佔用的海面約600公頃。風場每年發電約1.7百萬度，佔港燈2009年的總發電量1.6%，足夠5萬個家庭使用。

港燈計劃在2015年建成離岸風場。

#### 太陽能發電系統

在2009年，港燈與杜邦太陽能有限公司簽訂合同，購買其在深圳製造的非晶硅薄膜太陽能光伏板，進行太陽能發電。港燈的太陽能發電系統總容量為550千瓦，由5500塊光伏板組成，每塊容量為100瓦，鋪蓋在南丫電廠的主廠房天台。這個太陽能發電系統剛在2010年7月建成投產，估計容量因素為12.9%，年發電量約62萬度，足夠150個家庭使用。該系統是目前全港最大的太陽能發電系統。

港燈計劃在2012將該系統擴建至1兆瓦容量。

### Biography

Mr Frank Lau has been with the Hongkong Electric Company for over 30 years. He has a lot of experience in the project management of a number of large power plant development projects, including Lamma Power Station in HK, and a few other power plant projects in mainland China and overseas. He has all round design and construction experience in thermal power plants, fuel supply systems as well as emission control facilities. Recently, Mr Lau turns his focus to renewable energy development. His current position in Hongkong Electric is General Manager (Projects).