

14 September 2015

CLP Creates Hong Kong's Largest Sky Woodland to Promote Green Rooftops

CLP Power Hong Kong Limited (CLP) has created the largest Sky Woodland in Hong Kong at its Chui Ling Road substation in Tseung Kwan O. CLP hopes the success of the Sky Woodland project will generate interest and discussion among other businesses and organisations and provide a blueprint for further rooftop greening across the city.

CLP today (14 September) organised the first media tour of the Sky Woodland. Professor Jim Chi-yung, Chair Professor of Geography at the University of Hong Kong and advisor to the project, explained the principles behind the Sky Woodland and its benefits.

Chui Ling Road substation is one of the major sources of electricity supply to the Tseung Kwan O district, providing a reliable power supply to residential developments, recreational facilities such as the Tseung Kwan O Sports Ground, and to the Tseung Kwan O Industrial Estate. The Sky Woodland on the rooftops of two substation blocks covering area of 520m², together with 500m² of vertical greening on the substation walls, is the largest of its kind in Hong Kong.

The Sky Woodland is far more than just a rare stretch of urban greenery. It is a slice of genuine woodland in the city with its building structures tailor-made to replicate a natural woodland environment, hosting 80 trees made up of 32 native species. Since its launch in May 2013, the Sky Woodland has attracted an abundance of birds and insects. CLP hopes the Sky Woodland, when it develops into a mature eco-system, will help enrich the native biodiversity and contribute to a better living environment by improving air quality, fulfilling CLP's long-term commitment to promote sustainable development through its daily operations.

The Sky Woodland project was presented with the Gold Award for the Transmission and Distribution Project of the Year at the Asian Power Awards in 2013 for its distinctive feature and sustainable design.

Attachment: Fact Sheet on CLP Chui Ling Road substation Sky Woodland Project

About CLP Power Hong Kong Limited

CLP Power Hong Kong Limited ("CLP Power") is a 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 service to 5.8 million people in its supply area.

Photo captions:

Photo 1



Mr Eric Cheung (left), Deputy Director (East and West Region) of CLP Power Systems, and Professor Jim Chi-yung (right), Chair Professor of Geography at the University of Hong Kong, show off the fruits of *Phyllanthus emblica*, one of the native trees planted in the Sky Woodland.

Photo 2



Mr Eric Cheung (right), Deputy Director (East and West Region) of CLP Power Systems, and Professor Jim Chi-yung (left), Chair Professor of Geography at the University of Hong Kong, introduce the features of Sky Woodland.

Photo 3



An aerial view of the Sky Woodland at the CLP Chui Ling Road substation.

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CLP Power's Sky Woodland Brings Verdant Greenery to the Local Community

Background

Hong Kong is an urban jungle of high-rise buildings with precious few green areas because of its dense population and limited open spaces. However, major urban centres in Europe and Japan have demonstrated how rooftop areas can be used to bring greenery into the heart of the busiest of cities and CLP Power Hong Kong (CLP) has drawn inspiration from their example.

One of the core values of CLP is caring for the environment. The company in 2006 teamed up with University to pioneer a study on Sky Woodland at rooftop of power substation that would be the first of its kind in the city.

By carefully reviewing study results and working out a formula that would best suit Hong Kong, the largest Sky Woodland in the city was opened at the Chui Ling Road Substation in Tseung Kwan O in May 2013. It is an initiative that benefits the community and the environment by enriching native biodiversity.

CLP's hope is that the success of the Sky Woodland project will generate interest and discussion among other businesses and utilities, and provide a blueprint for future rooftop greening projects across Hong Kong to make our city greener and heighten environmental awareness.

Features of the Sky Woodland



The CLP Chui Ling Road Substation in Tseung Kwan O is close to a number of major residential areas, tertiary institutions and community facilities. The Sky Woodland has been planted on the rooftops of two substation blocks, covering areas of 520m² together with 500m² of vertical greening on the substation walls. The Sky Woodland is home to 80 trees made up of 32 native species and is the largest project of its kind in Hong Kong.

The Sky Woodland is far more than just a rare stretch of urban greenery. It is a slice of genuine woodland in the heart of the city, replicating a natural woodland environment that nourishes wildlife and enriches native biodiversity. In the two years since its launch, it has attracted an abundance of birds and insects and serves as a habitat, offering food and shelter to wildlife and bringing life and beauty to the city skyline it has transformed.

Indigenous species were chosen for the Sky Woodland as they adapt better to local climate and environment. A special emphasis was put on species that are related to the city, such as *Bauhinia x blakeana*, Hong Kong’s floral emblem, *Aquilaria sinensis* which shares a significant relationship with the name of Hong Kong, and *Rhodoleia championii*, an indigenous species with a high conservation value.

CLP specially selected colourful species such as *Liquidambar formosana* and *Elaeocarpus decipiens* while designing the Sky Woodland to showcase the beauty of nature in different seasons and to beautify the surrounding environment.

Benefits of the Sky Woodland

As well as its ecological benefits, dead leaves in the Sky Woodland decomposed when they wither away, releasing nutrients for the trees and forest life cycle. The Sky Woodland is beneficial to air quality in the community, enhancing buildings’ energy efficiency by reducing the indoor and outdoor temperature through solar heat absorption and transpiration*. The air and soil layers provide effective insulation and stop the buildings being exposed to direct sunlight. They also prolong the lifespan of the buildings’ waterproofing layer by 10 to 20 years and reduce maintenance costs by protecting the structure of the rooftops.

Benefits of Sky Woodland		
Promotes biodiversity	–	Serves as a habitat, offering food and shelter to wildlife. Increases biodiversity and enriches the community ecosystem.
Improves the environment	–	Beautifies the landscape of urban buildings. Filters and precipitates particles in the air.
Lowers temperature	–	The air and soil layer is effective in insulation and stops the buildings being exposed to direct sunlight.
Extends the lifespan of the rooftop	–	Prolongs the lifespan of the waterproofing layer of the buildings by 10 to 20 years as well as reducing maintenance costs by protecting the structure of the rooftops.



Aquilaria sinensis was once widely grown in Hong Kong to make incense and medicine for exporting to the mainland and overseas. “Hong Kong” is said to be originated from the Chinese character “Hong” (incense).



Myrica rubra is a food source for birds. Its root nodules system also provides nutrients that help the growth of surrounding plants.



Wisteria sinensis on substation wall helps absorb air pollutants.



The leaves of *Liquidambar formosana* turn yellow and red in the autumn.

*Transpiration is a biological process by which water loses from a plant through pores on leaves.

From the moment the idea for the Sky Woodland was conceived, CLP liaised closely with stakeholders to discuss the appearance and design of the substation and the tree species to be planted. Meetings were held and advice sought from government departments, district council members, tree experts and local residents to make sure the project carefully balanced the area's different needs and interests.

The Challenges in Creating the Sky Woodland



Medium-sized trees were planted in the centre of the rooftop while smaller ones were placed on the outside.

The soil on the rooftops is about one metre in depth, providing excellent drainage and waterproofing while preventing flooding and mosquito breeding. Small to medium sized trees, which are shorter than 10 metres in height with a slow growth rate, are suitable to the rooftop setting. Root barriers are installed to prevent over growing roots from damaging the buildings' structure.

CLP carefully considered maintenance and management issues during the design stage of the Sky Woodland. Suitable species were collected and grown in a nursery for more than two years before being moved to the rooftops when the substation was completed.

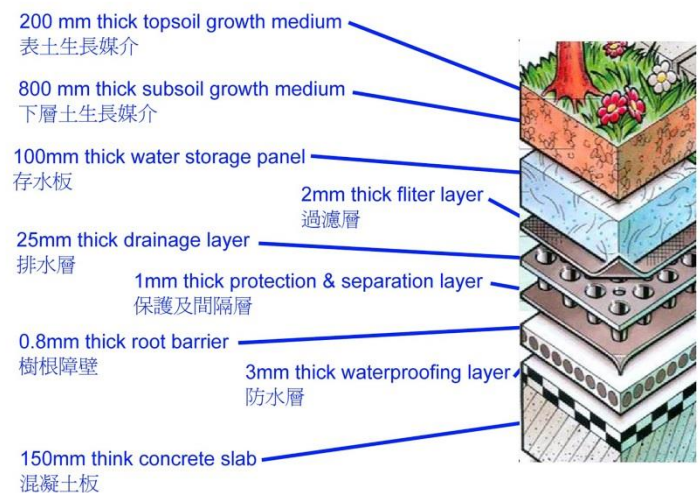
To ensure a smooth and fast tree loading process, the team planned well ahead in every aspect including transportation and planting to make sure the trees were in good condition and could adapt well to the rooftop environment with only minimal maintenance.

To make the substation operate in a greener way, automated irrigation systems have been put in place, collecting rainwater for irrigation. Evaporation is minimised by the planting of *Ophiopogon japonicas* in the woodland. The substation makes good use of natural ventilation and natural light to save on power consumption through lighting and ventilation.

Solar panels have also been installed to power the irrigation system with renewable energy.

CLP took careful measures to ensure that the Sky Woodland with its 80 trees could flourish healthily on the rooftops of the substation without in any way affecting the power supply and the safe operation of the substation.

Hong Kong has a subtropical climate with seasonal rainstorms and typhoons. All the trees in the Sky Woodland were therefore planted closely together in locations that best suit their natural characteristics with height and growth cycles considered to maximise their wind resistance.



Key Milestones

Date	Incident
December 2006	CLP teams up with the University of Hong Kong and begins studying and testing out the Sky Woodland concept
May 2008	Trial planting is carried out on the rooftop of the Sham Mong Road Substation in Lai Chi Kok to collect experiment data
December 2010	The Sky Woodland project is drafted for the Chui Ling Road Substation in Tseung Kwan O and an extensive community consultation gets under way
January 2011	Design work begins along with the collection of suitable trees
July 2012	Construction of the substation starts
April 2013	Planting begins
May 2013	The Sky Woodland is formally commissioned
October 2013	The Chui Ling Road Substation wins the Gold Award at the Asian Power Awards 2013
2015	The Sky Woodland continues to flourish and grow healthily

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Plants in the Sky Woodland



楓香
Liquidambar formosana



土沉香
Aquilaria sinensis



洋紫荊
Bauhinia x blakeana



五月茶
Antidesma bunius



郎傘樹
Ardisia hanceana



大苞山茶
Camellia granthamiana



廣寧油茶
Camellia semiserrata



水翁
Cleistocalyx nervosum



黃牛木
Cratoxylum cochinchinense



鰲蒴錐
Castanopsis fissa



陰香
Cinnamomum burmannii



杜英
Elaeocarpus decipiens



大頭茶
Gordonia axillaris



女貞
Ligustrum lucidum



潺槁樹
Litsea glutinosa



絨毛潤楠
Machilus. velutina



厚斗柯
Lithocarpus elizabethae



檵木
Loropetalum chinense



短序潤楠
Machilus breviflora



餘甘子
Phyllanthus emblica



豆梨
Pyrus calleryana



楊梅
Myrica rubra



腺葉桂櫻
Prunus phaeosticta



梭羅樹
Reevesia thyrsoides



紅花荷
Rhodoleia championii



山烏柏
Sapium discolor



鴨腳木
Schefflera heptaphylla



木荷
Schima superba



烏柏
Sapium sebiferum



假蘋婆
Sterculia lanceolata



海南蒲桃
Syzygium cumini



珊瑚樹
Viburnum odoratissimum