# SUSTAINABLE SUBSTATION DEVELOPMENT TO ENHANCE PUBLIC ACCEPTANCE

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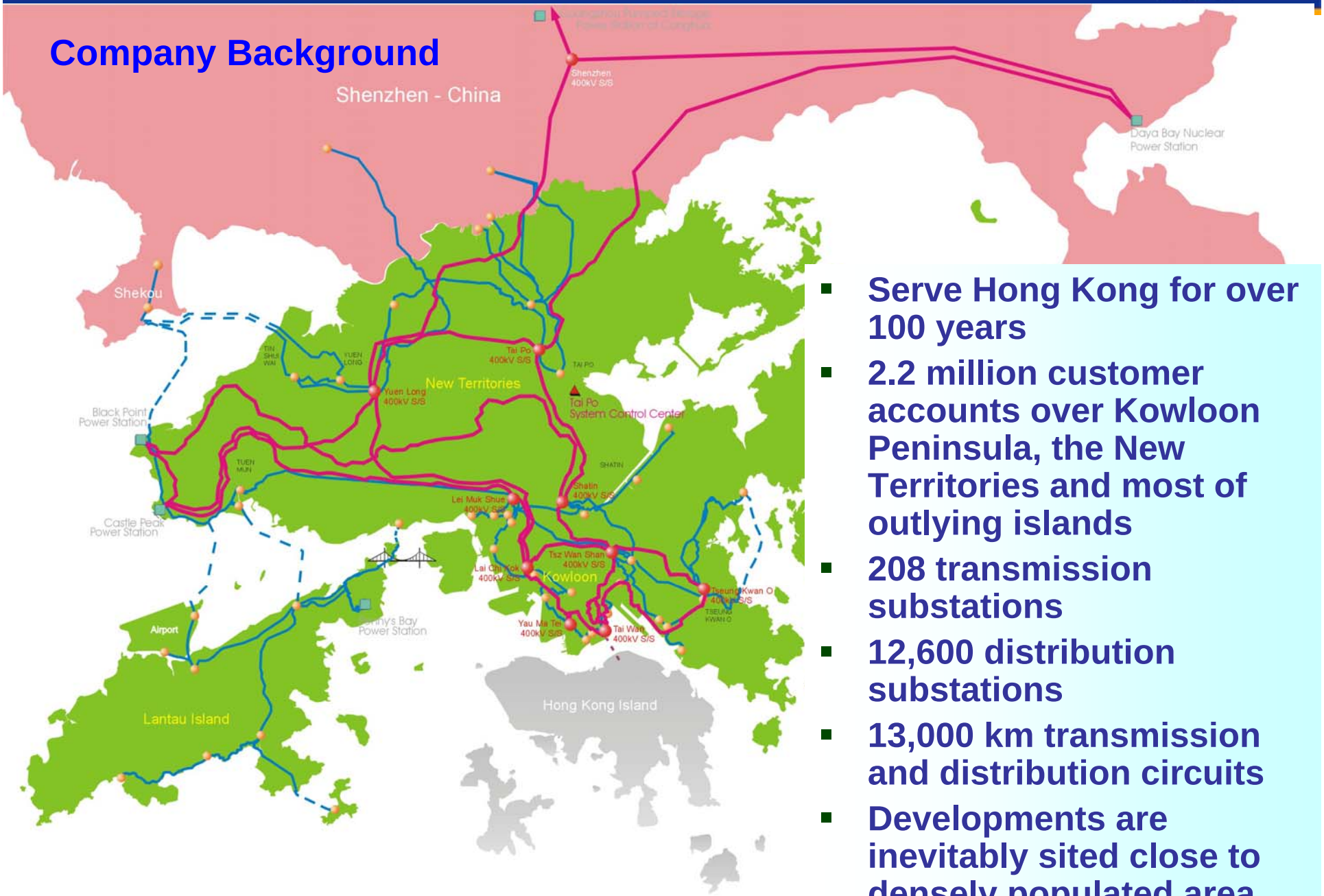
# Agenda

- Introduction
- Challenges Encountered
- Reasons for Objections
- Sustainable Substation Development
- Public Acceptance
- Successful Cases
- Conclusion


CLP Value Framework

# Introduction

## Company Background




- Serve Hong Kong for over 100 years
- 2.2 million customer accounts over Kowloon Peninsula, the New Territories and most of outlying islands
- 208 transmission substations
- 12,600 distribution substations
- 13,000 km transmission and distribution circuits
- Developments are inevitably sited close to densely populated area

## Project Cycle

Site Reservation

Planning Permission by

城市規劃委員會 Town Planning Board

The Lands Department

Land Grant Application to District Lands Office

屋宇署 BUILDINGS DEPARTMENT

Building Plan Approval

Public Consultation process is included

Foundation, Superstructure & Plant Erection

Substation Completed & Commissioned

# Challenges Encountered

- Local community may raise objection during public consultation stage or construction stage
- Although most people understand that facilities are required, common attitude is ‘not in my backyard’ (NIMBY) - request consideration of other alternatives
- In extreme cases, formation of action groups to protest against Government or Company

**Company will suffer**

- company image
- money
- project completion time
- claims from contractors

# Reasons for Objections

- **Economic and environmental impacts fall mainly on immediate neighborhoods**
- **Some do not want to change their environment and expected life style.**
- **Some might have been frustrated by utility works in the past and have ill-feeling to any similar work near them**

**Other misconceptions or concerns:**

- **permanent disfiguration of the beautiful scenery**
- **visual impact of the additional structure**
- **devaluation of the adjacent properties**
- **potential impacts to their building structure**
- **adverse impacts to environment, such as noise and heat**
- **perceived hazards to health and safety due to the plant facilities**
- **nuisances and dangers caused by construction activities**

# Sustainable Development Approach

## Framework of Environmental Design Guideline

| | |
|---|---|
| ▪ Site Selection and Planning<br>▪ Well-integrated Design<br>▪ Resource Management | Planning |
| ▪ Daylight and Sunlight control<br>▪ Natural Ventilation Strategy<br>▪ Sustainable Landscape Design<br>▪ Low Loss & Low Noise Design | Architectural |
| ▪ Energy Efficiency Management<br>▪ Renewable Energy<br>▪ Water Management | Renewable & Recycle |
| ▪ Reduction of Disposed Materials<br>▪ Containment System<br>▪ Environmental Friendly Material<br>▪ Green Construction | Technical |
| ▪ International Standards | Benchmark |

**Balance interests of**

- **society,**
- **local community, and**
- **the Company**

**through sustainable development approach and enhances acceptance of the project development by the public**

## *Core Values*

**Cares for People** | **Cares for the Community** | **Cares for the Environment** | **Cares about Performance** | **Respect Laws and Standards** | **Innovation and Knowledge**

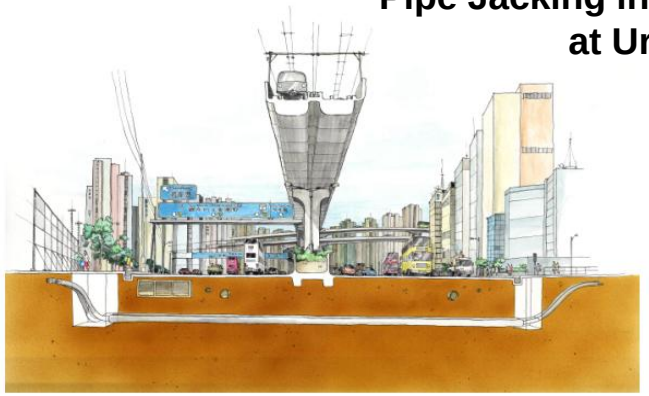
# Gaining Public Acceptance

## Planning and Design Stage

`Site Selection'
- consider reactions from local communities
- choose the site close to existing utilities

132 kV Substation Building adjacent to LPG Filling Station

**Cable tunnels and no-digs reduce objections by hiding the electrical facility from the view of the public, minimise negative impacts to the public and the environment**



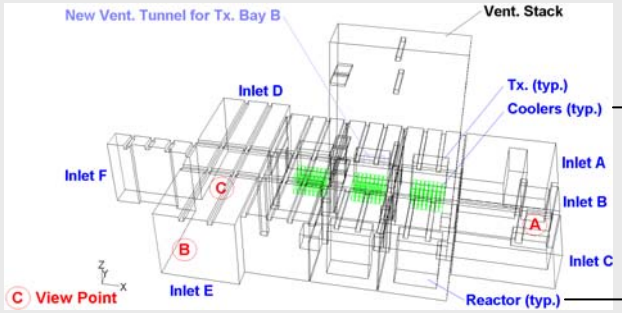
Pipe Jacking installation at Urban Area

**Engineering Solutions to minimize environmental impacts**

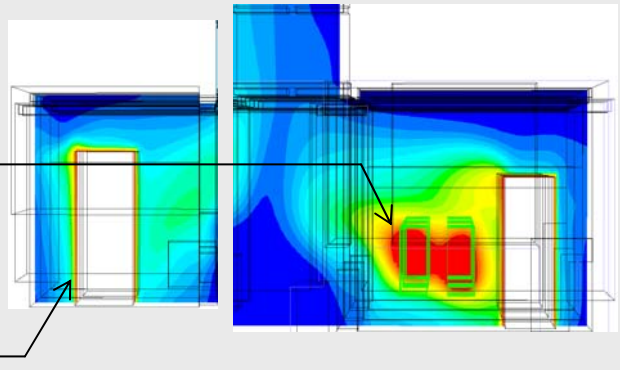
# Gaining Public Acceptance

## Natural Ventilation & Natural Lighting

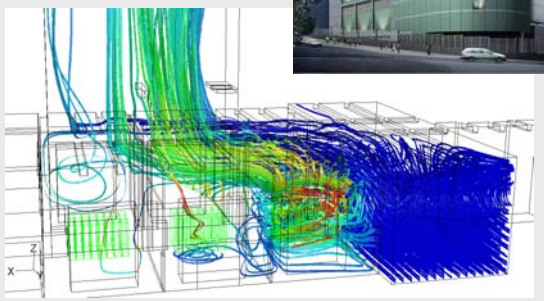
### Yiu Wing Street 132 kV S/S




General Arrangement of Yiu Wing St. S/S – Isometric View



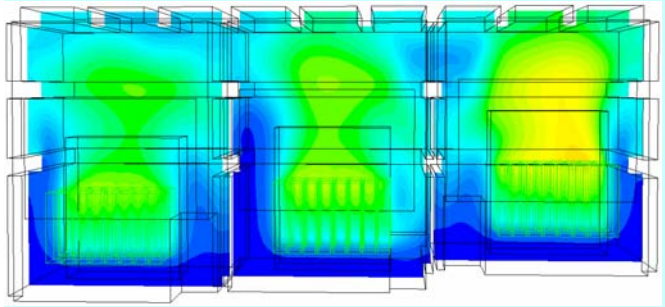
Natural Ventilation assessed by Computational Fluid Dynamics Model

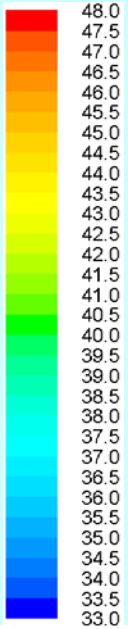


Air Path Lines from Inlet D

### Natural Ventilation at Junk Bay Road S/S

3 nos transformer bays

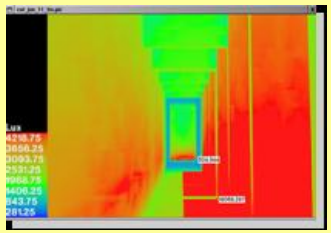





Computational Fluid Dynamics Model

### Natural Lighting and Staircase Glazing at Substation Building

Natural Daylight Effect in Corridor



Computational Fluid Dynamics Model for Natural Daylight

Staircase Glazing

# Gaining Public Acceptance

## Landscape Design – Sky Woodland

### Green Roof System


**Other Green Landscapes**

**CLPP and Prof. Jim (University of Hong Kong) jointly research the Sky Woodland**

**New Equipment Building with Sky Woodland**

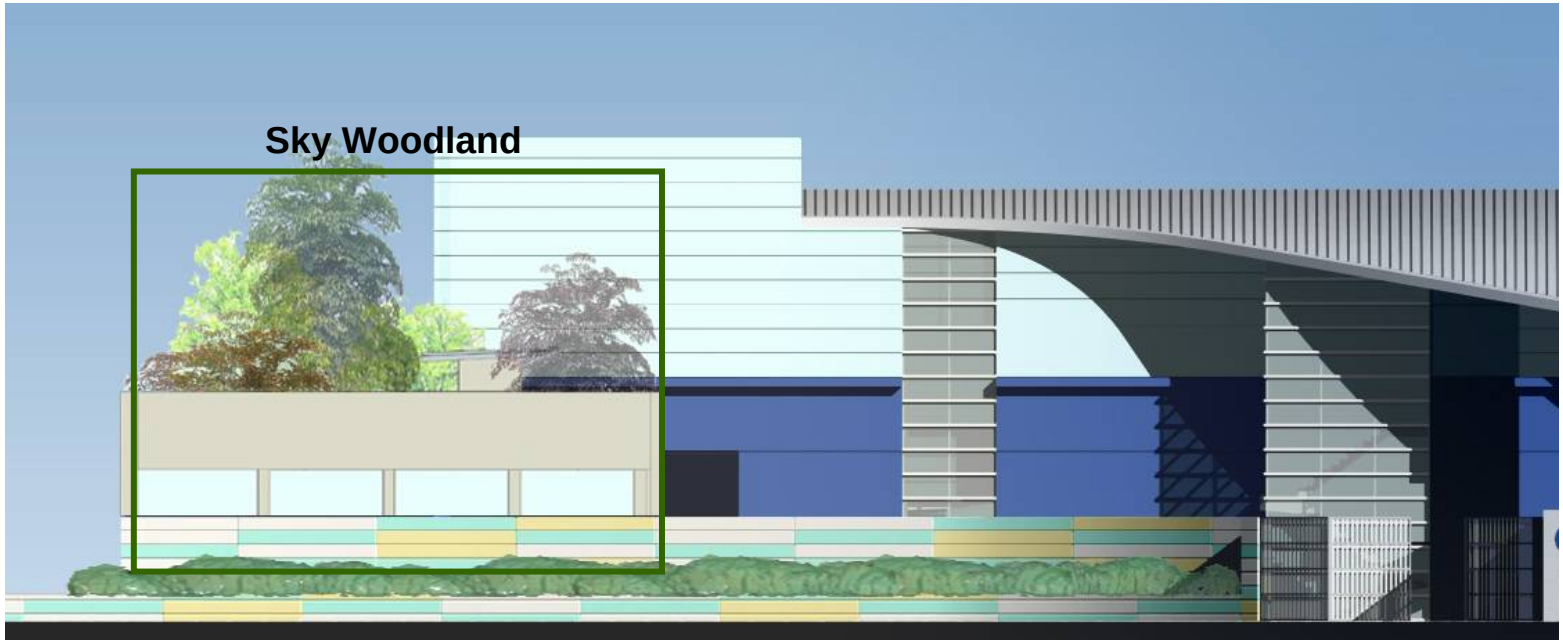
**Sky Woodland Design for Equipment Building at Sham Mong Road 132 kV Substation**

**Roof woodland creates values for neighbors by improving air quality and the anesthetic view, hence enhancing acceptance by local community to the project development.**

# Gaining Public Acceptance

## Landscape Design

### Sham Mong Road Equipment Building - Pilot Sky Woodland Project



# Public Acceptance

## Façade Design **Creates Values in Sustainability for Local Community**

**So Kwun Wat Substation**

**Wan Po Road Substation**

**Ma Wan Substation**

**Junk Bay Road Substation**

**Centenary Substation**

**Mai Po Substation**

**Yiu Wing Street Substation**

**Lai Cheung Road Substation**

- **Oil-free Switchgear**
- **Low Noise Low Loss Transformer**

- **Oil-free XLPE Cable**
- **No dig and Horizontal Directional Drilling (HDD)**
- **Cable Tunnel**

**Fu On Street Substation**

# Gaining Public Acceptance

## Green Construction

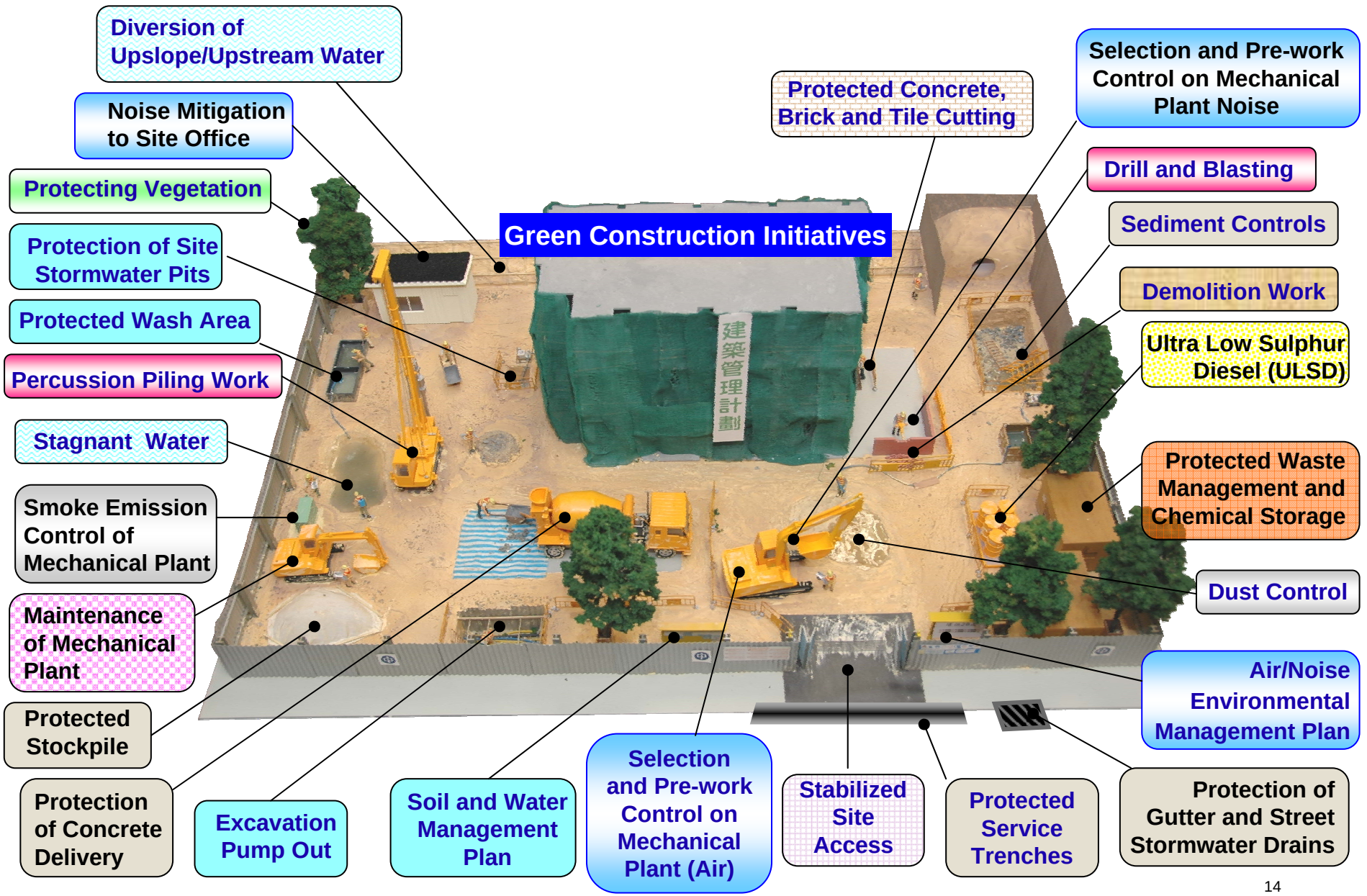
- **Enhance Performance in Safety, Health and Environment - Zero Accident during the construction stage of Substation**
- **Enhance communications and participations of all workers about the work**
- **Enhance contractors awareness and understanding of work risks**
- **Improve quality of works**
- **Compliance of IMS, ISO9001, OSH18001 & ISO14001**
- **Implementation of Construction Management Plan, Behavioral Based Safety Observation and 5S Housekeeping Practices**
- **Develop 26 nos. `sustainable development' initiatives in construction work**


**Gold Award presented by Cheung Hau-wai, JP, Director of Buildings Department to CLP and Shui On**


**Awards on Considerate Contractors Site Award Scheme 2006**


**6th Hong Kong Occupational Safety & Health Award**
**Silver Award in Safety Promotion**

# 26 Construction `Sustainable Development' Initiatives



# Feng Shui (風水)

***Feng Shui* is a common concern raised for project development in rural area.**

**Some villagers believe that construction work near village will spoil local *feng shui* and/or lead to wrath of spirits, bringing misfortunes to people and the village.**

**CLP aims to respect the local custom and maintain the amicable relationship with villagers.**

**Trees near the site will be maintained as much as practical.**

**Maintain Trees Around Substation Building**

**Another common way acceptable to villagers is by holding a *tun fu* ceremony**

***tun fu* Ceremony officiated by `Taoist' Priests**

## A 132 kV Substation near Residential Estate

**Meetings and road-show sessions with Local Community:**

- low noise and low energy loss type transformers
- reliable fire services installation
- the project would not affect the health of neighbors
- comprehensive and environmentally friendly construction management system
- outlook of the building blend in with the environment
- improve landscape feature of adjacent `rest' garden

Architectural visualization – substation rest garden

Color scheme options matching adjacent building

**Provision of a Rest Garden**

Visual impact - from roof of adjacent estate building

Visual impact - from 1st floor of adjacent estate building

# Successful Cases

## Cable Tunnel near Residential Estate

### Change to environment after Development


**Before Development** **After Development**

**Visual impact – Front View of Tunnel Inlet Building**

### Conduct Social Public Activities

### Mitigate Nuisances during Construction

**Noise Control**

**Traffic and Dust Control**

# Conclusion

- **Locally Unwanted Land Use is a common challenge faced by CLP even though the local community has little objection to the extension of the power supply network.**
- **CLP adopts a sustainable development approach in the planning, design and construction of substation buildings. This approach helps to gain the public acceptance of the site for new project development and reduces the objections from the local community.**
- **To face the challenges ahead, CLP will need to further enhance the company image, develop skills in working with the public on controversial issues and align with the government during the planning stage.**

*Thank You*