New and Renewable Energy Priorities: Hong Kong, China

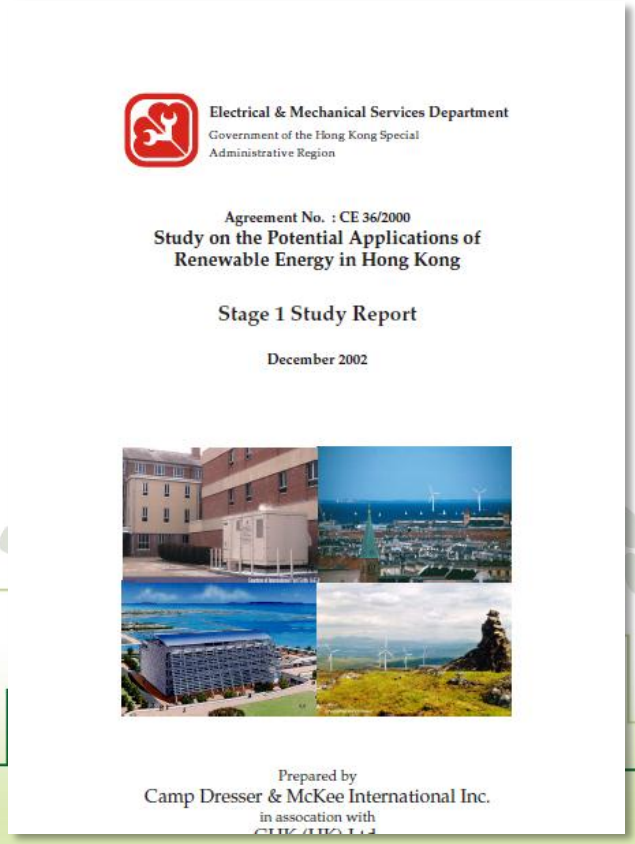
APEC EGNRET Meeting
16-17 October 2013

Energy Efficiency Office, EMSD
Hong Kong SAR Government
Hong Kong, China

機電工程署 EMSD

Government's Study

Study on the Potential Applications of Renewable Energy in Hong Kong



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Assessment of RE Potential

- Resources available
- Technologies
- Technical barriers, financial issues and others considerations
- Implementation strategy
- Potential applications

Development Constrains

- **Population density: 6,500 persons / km^2**
- **Lack of resources / essential criteria for development of hydro power, geothermal, tidal and wave energies**

Major Considerations

- Suitable sites for large scale projects
- Visual and noise impacts
- Relatively high equipment and generation costs
- Grid connection and open electricity market consideration
- Demonstration/ education

Potential for wider applications

Study on the Potential Applications of Renewable Energy in Hong Kong

- **Solar**
- **Wind**
- **Energy-from-waste**

1. Government Take the Lead

- Technical circular in 2005 encourages all public works projects to adoption RE technologies as far as reasonably practicable
- Another technical circular in 2009 set the comprehensive target-based green performance framework for new and existing Government buildings
- Undertaking demonstration projects

2. Utility Sector

- **Encourage the power companies to develop and adopt RE technologies.**
- **In the 2008 Scheme of Control Agreements, the two power companies enjoy a higher permitted rate of return for their investment in RE facilities (i.e. 11% for RE vs 9.99% for other fixed assets).**

2. Utility Sector

- **A bonus of 0.01 to 0.05 percentage point in permitted return is also offered in accordance with the extent of RE usage in their electricity generation.**
- **Power companies to formulate standardized arrangements for connection of RE equipment to their electricity grids**

3. Tax Incentives

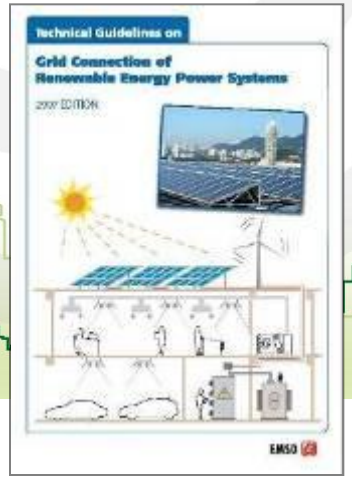
- **Capital expenditure of the private organization's RE power system in building can be deducted over a 5-year period starting from the year of purchase**

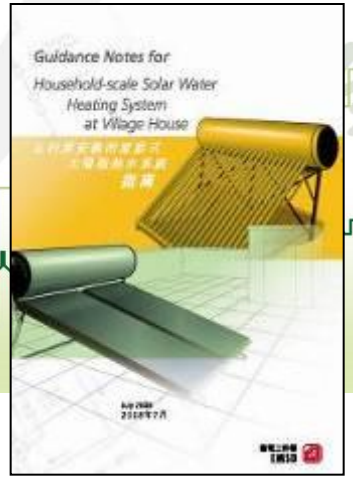
4. Funding Schemes

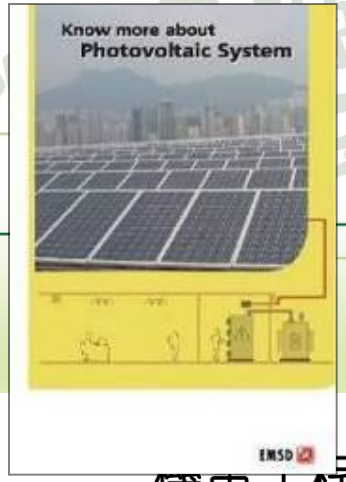
- Environment and conservation fund
- Sustainable Development Fund
- Quality Education Fund
- Innovation & Technology Fund targeted for SMEs
- Sponsorship funds from power companies

5. Technical Support

- **Technical Guidelines on Grid Connection of Renewable Energy Power Systems**
- **Know more about Photovoltaic System**
- **Guidance Notes for Household-scale Solar Water Heating System at Village House**

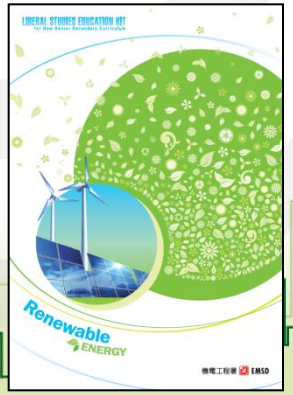






6. Education and Information Support

- Seminar & School Talks
- EMSD Education Path Tours
- Websites (e.g. HK RE NET and EnergyLand)



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Example 1

- **EMSD HQs – 350kW PV System**

Example 2

- **Solar water heating installation - Sheung Shui Slaughter House, with 882 m^2 of solar collectors**

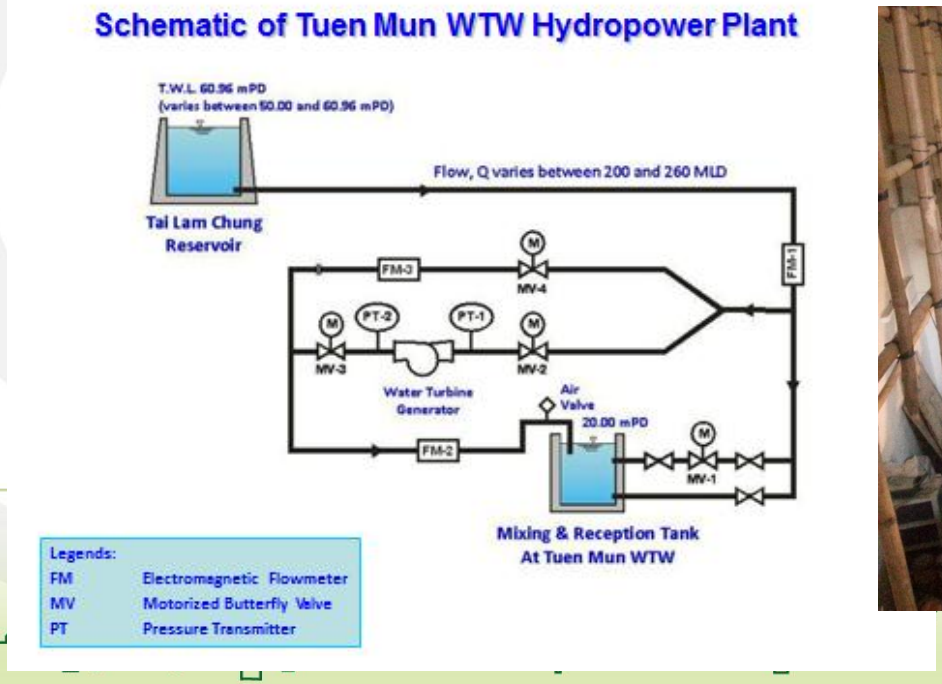
Example 3

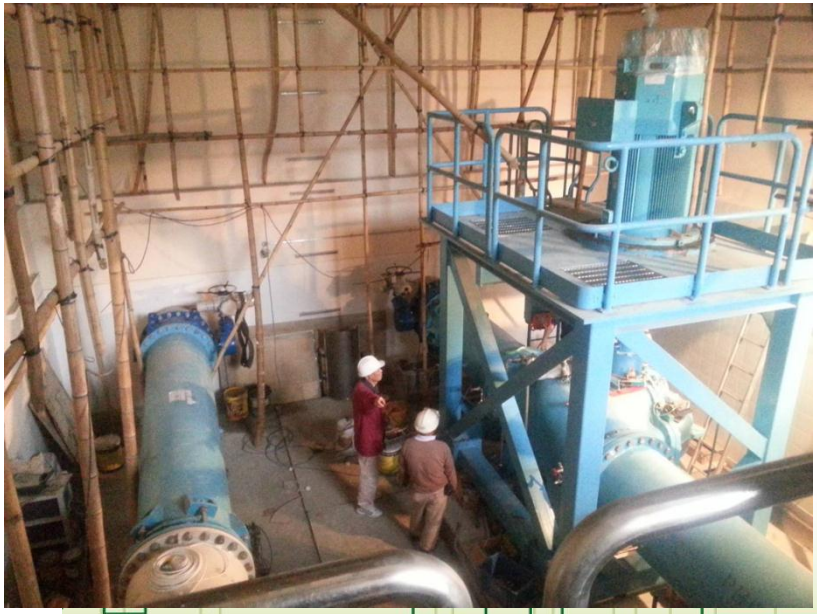
Zero Carbon Building

- **100kW PV system of Construction Industry Council**
- **45kW biodiesel CHP (for B100)**
- **Light pipe**
- **Other energy efficiency technology**

Example 4

Hydropower Plant at Water Treatment Works





Example 4

- **Stage 1: 180kW completed in Mar 2013**
- **Stage 2: another 180kW in 2016**
- **Estimated annual electricity generation about 2.9 million kWh after completion**

Example 5

- Town Island Renewable Energy Project
- Power company to supply electricity to a remote island
- Submarine cable / overhead line: uneconomical & adverse environmental impact
- Stage 1 & 2 – 180kW PV & 2x 6kW wind turbines
- Equipped with batteries capable of storing over 1,000 kWh

Example 5

- **Town Island Renewable Energy Project**

Example 6

- **1 MW PV System at Lamma Power Station**

Example 7

- **800 kW wind turbine at Lamma Island**

Example 8

Landfill Gas Utilization

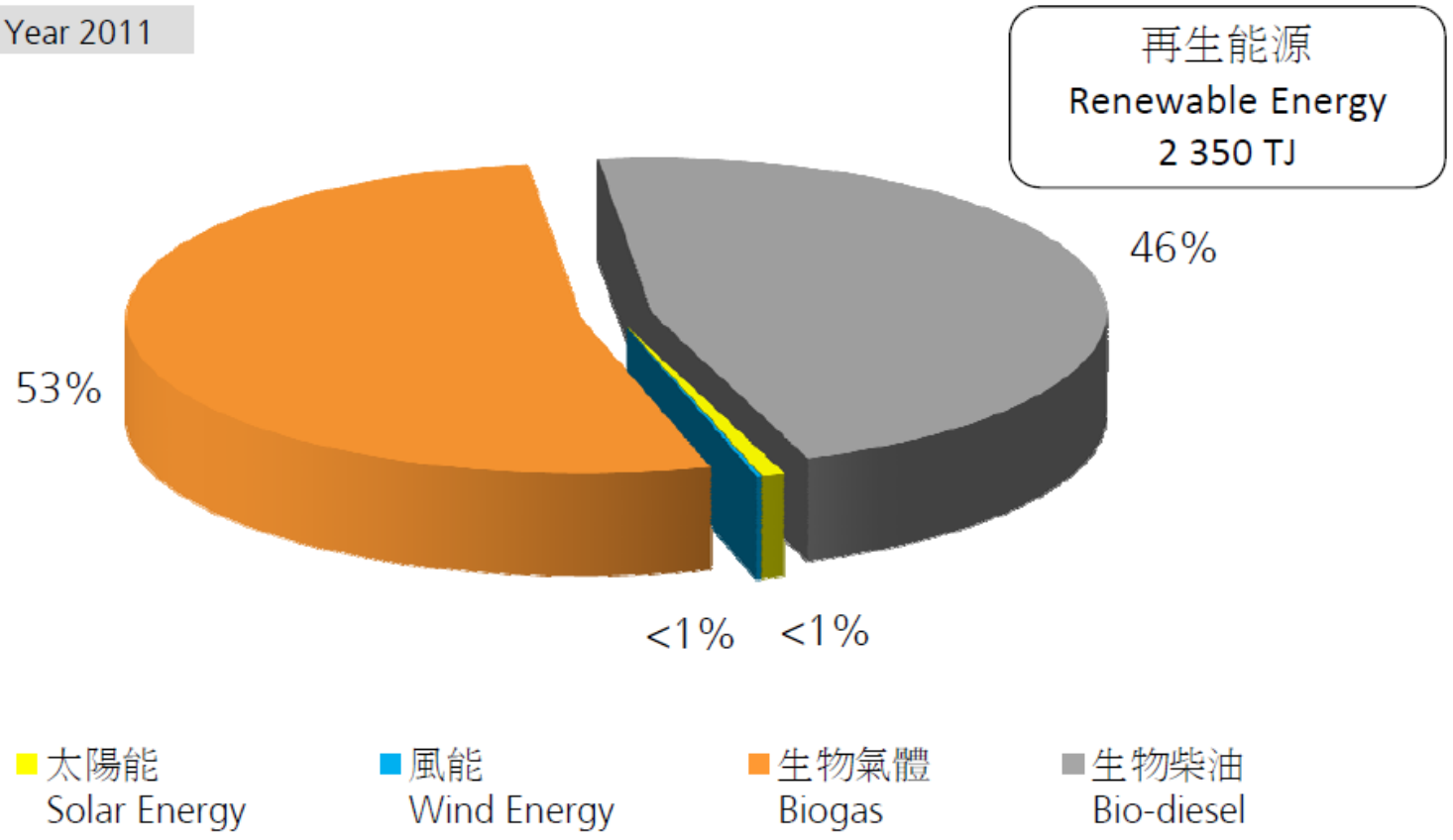
- **3 strategic landfill sites**
- **Electricity generated for on-site infrastructures / leachate treatment facilities**
- **As fuel for production of towngas**

Example 9

Generation of Electricity by Biogas in Sewage Treatment

- **biogas has been used as fuel for gas boiler**
- **Electricity generated in three CHP generation systems.**
- **These include one 330 kW and one 635 kW and another 625 kW CHP**

Energy End Use of RE in HK



Energy End Use of RE in HK

- The amount of gaseous energy of renewable origin accounts for roughly 2.5% of the total“Town Gas & LPG” consumption in Hong Kong.
- The amount of oily energy of renewable origin accounts for roughly 1.3% of the total “Oil & Coal Products” consumption in Hong Kong.
- The amount of electricity of renewable origin accounts for roughly 0.1% of the total electricity consumption in Hong Kong.

Thank You