

DEMAND SIDE MANAGEMENT IN HONG KONG

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1. Introduction

With a view to promoting energy efficiency and conservation, the Government of the Hong Kong Special Administrative Region (the SAR Government) and the two local power companies, i.e. The Hongkong Electric Co. Ltd. (HEC) and CLP Power Hong Kong Limited (CLP Power), have carried out various activities to promote Demand Side Management (DSM) since 1993. The major objective of DSM is to reduce electricity peak demand and energy consumption in the long term through implementation of measures to influence the level or timing of consumers' electricity demand in order to optimize the use of power generation, transmission and distribution facilities. Agreements between the SAR Government and each power company have been entered in May 2000 for implementation of full-scale DSM programmes by the power companies starting from July 2000 to June 2003.

2. Types of DSM Programmes

Currently, three types of DSM programmes, namely Energy Efficiency Programme, Peak Clipping Programme and Load Shifting Programme, are being promoted in Hong Kong.

2.1 Energy Efficiency Programme

This programme, such as Energy Efficiency Labelling Schemes for Household Appliances, Building Energy Codes and the associated Guidelines etc., encourages consumers to look for more energy efficient appliances/electrical installations when they purchase new ones or replace the existing ones. Through the extensive usage of energy efficient appliances/electrical installations, the electricity peak demand and energy consumption can be reduced.

2.2 Peak Clipping Programme

This programme, such as CLP Power's Time-Of-Use (TOU) Rate for Bulk Tariff customers, encourages consumers to reduce their electricity consumption during peak hours so that the maximum demand of the overall system can be lowered.

2.3 Load Shifting Programme

This programme, such as CLP Power's Ice-storage Air-Conditioning Tariff, encourages consumers to shift their electricity consumption from peak period to off-peak period. As a result, reduction of electricity demand during the peak hours can be achieved.

3. Benefits of DSM

DSM will benefit the electricity users, the power companies and the environment. The users can save on their electricity bills by implementing various DSM measures, such as the use of energy efficient electric appliances and installations. The power companies can benefit from DSM programmes because the building and operating of new power plants to meet growth in electricity demand is more expensive than the implementation of DSM programmes. Spending less money on power plants helps to lower the capital investment and operation costs for the power companies thereby, in long term, reducing upward pressure on electricity tariffs. Effective reduction of electricity demand or shifting the demand from peak periods to off-peak periods means less impact on the environment with the avoidance of new plant and related transmission lines.

4. DSM Development in Hong Kong

A DSM Working Group, with members consisting of representatives from policy bureaux, Electrical and Mechanical Services Department (EMSD) and the two power companies, was set up in November 1993 to oversee the development of the power companies' DSM programmes. In December 1995, EMSD commissioned a consultancy study to formulate a regulatory structure for implementation of DSM programmes by the power companies and to identify the appropriate programmes for implementation in Hong Kong.

After negotiations between the SAR Government and each of the power companies and consultations with Legislative Council about the implementation of the power companies' DSM programmes in 1999, the SAR Government eventually entered into a 3-year DSM Agreement with each power company in end May 2000 and approved the companies' DSM Resource Plans in June 2000.

The power companies launched their DSM programmes, including Energy Efficient Lighting Rebate Programmes for non-residential customers, as well as education and informational programmes to promote energy efficiency and conservation, on 1 July 2000. They also launched their rebate programmes for energy efficient Heating, Ventilating and Air-Conditioning (HVAC) measures, such as variable speed drive (VSD), for non-residential customers in June 2001.

5. DSM Programmes Implemented by the Power Companies

Programmes that have been committed by the power companies in their 3-year DSM Resource Plans for full-scale implementation include:

- Non-residential Energy Efficient Lighting Rebate Programmes
- Non-residential Energy Efficient HVAC Rebate Programmes
- Time-of-Use Rate for Non-residential Bulk Customers
- General Education / Informational Programmes on DSM
- Load Researches for DSM Planning

5.1 Non-residential Energy Efficient Lighting and HVAC Rebate Programmes

All non-residential customers served by the power companies are eligible to participate in the rebate programmes. Participants will be given rebates for installing energy efficient equipment, including compact fluorescent lamps, energy efficient fluorescent tubes, electronic ballasts for fluorescent tubes, variable speed drives, and specific air-conditioning equipment, provided that the power companies' criteria for rebates are met. The companies will levy a DSM Charge on all non-residential customers to finance the rebate scheme and related programmes.

5.2 Time-of-Use Rate for non-residential customers

To encourage bulk commercial customers to use energy efficient equipment to save energy or to shift their electric loads from peak period to off-peak period, CLP Power has introduced a TOU rate to all Bulk Tariff customers since July 1996. Cheaper off-peak charges are offered for electricity consumed between 9:00 p.m. to 9:00 a.m. and all day Sundays and public holidays. HEC has committed in its 3-year DSM Resource Plan the introduction of a TOU rate for commercial bulk customers.

5.3 General Education Programme

The power companies would sponsor Education Department the design and production of an Energy Efficiency Education Kit CD-ROM for all primary 4 to 6 students. The objective of the kit is to educate young students so that they can spread their knowledge of energy efficiency and conservation among the household members, and to achieve long term cultural shift through changes in energy consumption habit.

5.4 Informational Programmes

The power companies have carried out technical seminars for the trade allies and private sector professionals involved in construction and energy-related commercial building design to provide them information about the latest development of the various energy efficient measures in the areas of lighting and HVAC and details of the power companies' rebate programmes for these measures.

5.5 Market Researches

The power companies would carry out surveys/studies to identify the load shapes of respective customer sectors and explore the potential for design of new DSM programmes.

6. Government's Efforts to Promote DSM

In addition to the DSM programmes implemented by the power companies, the SAR Government is also keen to implement its own DSM programmes. The SAR Government's initiatives in DSM mainly focus on the promotion of energy efficiency and conservation. These include

promoting public awareness of, and providing advice on, energy saving opportunities and benefits through education and publicity programmes, and establishing energy savings standards for the design of buildings, building services installations, energy-using equipment and appliances.

To give added impetus to implementing the SAR Government's initiatives in energy efficiency and conservation, the Energy Efficiency Office (EEO) was established in EMSD in August 1994 to provide technical expertise to develop and push forward energy efficiency and conservation programmes.

Some major energy efficiency and conservation initiatives being pursued by the SAR Government include the following:

6.1 Building Energy Codes

The Building Energy Codes are developed for use by building professionals in designing energy efficient buildings and building services installations. Guidelines for design of energy efficient building services installations have been prepared by EEO in conjunction with the Building Energy Codes, which comprise the following parts :

- Code of Practice for Energy Efficiency of Lighting Installations
- Code of Practice for Energy Efficiency of Air Conditioning Installations
- Code of Practice for Energy Efficiency of Electrical Installations
- Code of Practice for Energy Efficiency of Lift and Escalator Installations

The set of Building Energy Codes are being implemented via "The Hong Kong Energy Efficiency Registration Scheme for Buildings", which covers lighting installations, air-conditioning installations, electrical installations and lift/escalator installations.

6.2 Energy Efficiency Labelling Schemes

The Voluntary Energy Efficiency Labelling Schemes have been launched by EEO since June 1995. The Schemes currently cover six household appliance schemes on refrigerators, room coolers, washing machines, electric

clothes dryers, compact fluorescent lamps and electric storage water heaters, and one office equipment scheme on photocopiers.

6.3 Energy Audit Programme

An Energy Audit Programme has been carried out in some selected public buildings since 1993. Up to end 2000, a total of 129 buildings have been surveyed. Based on the results of the energy audits, EEO undertook a \$6M pilot programme in April 1996 to implement energy management opportunities in 20 public sector office buildings within 3 years by replacing the existing lighting and air-conditioning systems with advanced technology, such as electronic ballast and VSD.

6.4 Energy End-use Database

An energy end-use database for Hong Kong was established in end 1997 by EEO to provide useful insight into the energy supply and demand scene in Hong Kong, including energy consumption patterns and trends and energy use characteristics of the individual sectors and sub-sectors. The database will enable policy bureaux to evaluate energy policy in efficiency and conservation.

6.5 Education

Advisory notes and seminars on energy efficiency and conservation were provided to residential and non-residential consumers to promote awareness and to give useful tips for energy saving since 1993.

7. **Monitoring of the Power Companies' DSM Programmes**

The power companies' DSM programmes and related activities are continuously monitored by the SAR Government through periodic co-ordination meetings with the power companies. Each power company has to report the progress and performance of their DSM programmes, including the cumulative capacity and energy savings, programme expenditures, programme cost-effectiveness etc., on bi-monthly and annually bases for monitoring by the SAR Government to ensure the total target capacity saving of 33 MW can be achieved within the power companies' approved budgets.

Upon completion of the first year DSM programmes, the SAR Government will audit the programme results and performance reported by respective power companies through conduction of on-site audits in samples of the programme participants' premises. Similarly, an Energy Auditor would be appointed to audit the overall programme results and performance reported by respective power companies through conduction of on-site audits in samples of the programme participants' premises after completion of the 3-year DSM programmes.

8. Additional Information on DSM Programmes

Further information about the power companies' DSM programmes can be found at the following websites and telephone hotlines:

	Website	Telephone Hotline
CLP Power	www.clpgroup.com/dsm	26787007
HEC	www.hec.com.hk/hec/dsm	25551082

Other information about DSM can be found at EMSD's DSM webpage at www.emsd.gov.hk/emsd/english/energy/dsm or contact EEO of EMSD at 28828011 for details.