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Friends of the Earth (HK)'s Response to the Government Consultation on Future Development of the Electricity Market

"Be Power-wise"

Mar 30, 2006

Introduction

The response paper seeks to address the inadequacies of the Scheme of Control (SoC) in the power sector and recommends the inclusion of demand side management in the electric utilities. Renewables portfolio standard is proposed here as a market option worthy of consideration. For the details on Friends of the Earth (HK)'s position on renewable energy please revert to FoE (HK)'s response paper to the first stage consultation.[1]

The inadequacies of current power sector regulation are:

-absence of an energy policy

-the encouragement for expansion under the SoC

-omission of demand side management by the electric utilities

-want of policy support for the introduction of renewable energy

[1] 30 Apr 2005 - Response to Future Development of Electricity in Hong Kong Stage I Consultation: http://www.foe.org.hk/welcome/gettc.asp?language=tc&id_path=1,%207,%2028,%20152,%202908,%202942

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Actions needed for demand side management (DSM) are:

-innovative pricing to balance the peak and off-peak electricity demand

-scrapping of SoC, which is counter-productive to the introduction of DSM

-provision of financial incentives for the implementation of DSM measures

-enhancement of current energy conservation work

One of the badly needed pieces of information is the study on comparison of different energy futures on a detailed social, economic and environmental level that can be used as a rational basis for making decisions on energy policy. It is the government's responsibility to value, forecast and compare the benefits, externalities and risks of different energy futures.

Section 1 Deficiencies with current regulation of the power sector

1.1 Lack of an Energy Policy

Friends of the Earth (HK) would like to seize the opportunity of current consultation on Future Development of the Electricity Market to urge the need for a shift in the government's attitude towards policy-making. We are disappointed to see the Economic Development and Labour Bureau (EDLB), Hong Kong's sole energy policy maker, sacrificing public health in the name of electricity reliability and dithering from

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formulating a clear energy policy.

Equating the energy policy with financial agreements, one that sacrifices public interest, is unacceptable. The exclusion of environmental concerns relating to power generation in the Scheme of Control is irresponsible. And the lack of a holistic approach to the regulation of the power sector has led to a fragmented monitoring by the three government departments: EDLB, EMSD and EPD. The focus of current regulation is skewed heavily towards profit guarantees to secure supply while neglecting the demand side management of the electric utilities.

FoE (HK) believes the application of renewable energy and implementation of energy conservation measures are effective tools for improving the deteriorating air quality, which should form a central part of any responsible energy policy. The International Energy Agency, an intergovernmental body consisting of 26 industrialized member countries which advises issues in energy policy, says:

"Demand side activities should be active elements and the first choice in all energy policy decisions designed to create more reliable and more sustainable energy systems."

The consultation paper has failed to deliver details on the realization of the target set for renewable energy, neither does it provide content for the demand side management

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(DSM) by the electric utility.

Lack of definition on the objectives and a timetable for grid opening are indications of the government's short-term mentality towards future electricity market development. It would be unfortunate if the administration allows its categorically paranoid vision and unbalanced commitment to continue.

1.2 Absurdities of the Scheme of Control

1.2.1 Reliability at the Cost of Customer Interest

The Scheme of Control Agreements (SCAs) stipulate a specific rate of return entitled to both power companies. But the numerical mind ceases to function in the tariff adjustment section where neither formulas nor figures were put forth for considerations.

The existing tariff negotiation is highly secretive, and was reached behind closed doors between the government and the power companies.

The public's belief in a higher profit for lower tariff is a misconception. For the agreements say "the main purpose of the Development Fund is to assist in the acquisition of Fixed Assets."

So the HEC is justified to demand a higher tariff for a lower than expected growth of

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electricity demand and the CLP is merely complying with the agreement not to share the profit with the customers.

The agreements are designed to guarantee the power sector's profits and encourage over-expansion, not to provide effective pricing and emission control for the welfare of the customers. This policy should not be repeated.

As the only political power between millions of electricity end-users and the two power companies, it is the government's responsibility to prevent the population from being held hostage to CLP and HEC.

1.2.2 Omission of the Demand Side Management and Emission Control

The Stage II Consultation Paper has highlighted the fragmented thinking of the existing regulatory structure showering attention on economics while relinquishing environmental reasoning. FoE (HK) hopes this does not herald a similar lopsided attention in the policy formulation regarding future electricity market development.

The technical positioning of the EMSD has prevented the department from thinking beyond the technical aspect of renewable energy application; and the lack of expertise in renewable energy market policies in the EDLB has led to the consideration of RE rests disproportionately on technical facilitation without realizing the need for complementary

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policy support to catalyze the adoption and market for alternative energies.

The EPD's role as an environment caretaker is diminished by the emphasis of economic priorities apparent in the government's power philosophy, as exemplified by SCAs.

Even with the set-up of an independent regulatory body, the government still needs to have a holistic policy approach with clearly defined objectives and staff capable of achieving the envisaged mission. FoE (HK) believes the integration of environmental consideration in the government's economic planning is badly needed, so is the shaping-up works for energy regulation.

1.2.3 Lack of a Pricing Mechanism

There is no mechanism in the existing Scheme of Control to reward correct estimates or to penalize any over-estimates of future demand. There has been evidence suggesting the expansion in capacity by the two power companies is often many years ahead of the system's demand level, as the main objective of SOC is to encourage investments, which rewards excessive investments. The permitted returns are based on fixed assets that allow the two power companies to raise prices to meet capacity expansion.

CLP has taken the advantage by expanding more than necessary to meet the higher maximum demand due to the export of electricity to China. For example the capacity of

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CLP in 1994 was 7540 MW while the maximum demand was 4730 MW for Hong Kong, 5948 MW to include demand from China.

The asset based returns promote more power expansions rather than management of peak loads or energy efficiency. If customers were successfully encouraged to shift their demand for electricity to off-peak hours, the demand of additional generating facilities would decrease. Consequently, the asset base would become smaller and this would lower the permitted rate of return. The declining-block price structures adopted by the two power plants encourage wasteful use of electricity. For the commercial end-users, the more electricity they use, the smaller the tariffs for an electricity unit.

Section 2 Renewable Energy

2.1 A Tongue-in-cheek Proposal for Renewable Energy

2.1.1 Lack of policy support for RE

The current electricity grid is the private properties of the CLP and HEC respectively. Leaving the grid connection and access for renewable energy sources to negotiations between the renewable energy source and CLP and HEC is irresponsible, not to mention the inclusion of waste to energy as a form of renewables.

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“The Government will assist where necessary and when requested by either party, including assisting in arriving at mutually agreed access charges.” (Consultation Paper 2.22)

The uncertainty of grid access would deter the investment in renewables by a third party for the fear of not being able to get paid-back from their investments.

FoE (HK) does not see any reason for CLP and HEC to welcome entrance of a renewables producer to their grid unless it is stipulated by law.

FoE (HK) is more interested in knowing what kind of a regulatory structure would be designed for the use of renewable energy to happen in Hong Kong. Targets could be set but the means for realizing targets should precede the target setting. Otherwise, the proposal for renewable energy use is mere public relations. Lama Wind Power Station is an excellent public relations feat, made possible with huge capital to waste, that elevates the art of meaning no by saying yes, in monetary terms.

2.1.2 What to consider for RE policies?

Measures to promote RE should not be tied to specific revisions of the SCAs but rather should be compatible with any future regulatory scheme as competition and market restructuring do not inherently promote renewable energy. A lot has to be done by the

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government to garner policy support for renewable energy.

With all its shortcomings, SCAs have been effective at providing confidence to the electric utility for investments with its permitted returns and long contract duration. This is an example of how policies can be shaped to generate major investments. Failure to provide similar confidence for RE investments could create a huge barrier for the entry of RE.

If there are no policy directives or legislations for mandatory renewables take-up, the inherent inertia will prevent the shift from a fossil fuel electricity generation to a non-fossil-fuel one undermined with the lack of financial incentives.

One of the strongest advocate in RE is the European Union. The experiences there has shown that without additional policy measures or intensification of those currently used, many EU member countries are likely to fail to reach the national targets for the contribution of renewables in the year 2010 as indicated by the EU. These policies do one or more of the following:

a) Shift some of the investment costs away from the investor

b) Guarantee access to a market

c) Guarantee a certain market size

d) Guarantee a certain price on any quantity delivered.

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FoE (HK) recognizes the topographic constraints in Hong Kong. But such constraints are not exclusive of Hong Kong, as are concerns about land cost, visual impact and wind potential for the application RE. EU member countries' governments and citizens share similar concerns, which did not stop them from aiming for ambitious RE targets.

The European Union is aiming at 10% of electricity, or about 40 GW of installed power, from wind by the year 2010 and 100GW by 2020. In order to meet the October 2001 legal requirement to generate 10% of the country's electricity coming from renewables by the year 2010, British plans call for 18 offshore sites, with total installed power of up to 1.5 GW. The regional target for Western Europe is 66 GW by 2010 and 220 GW by the year 2020, with about one-third of that capacity placed offshore.

Section 3 Recommendations

Recommendation 1: Renewables Portfolio Standard

3.1.1 Renewables Portfolio Standard (RPS)

The Renewables Portfolio Standard (RPS) is a flexible market-based policy for increasing the amount of renewable energy. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources, and by increasing the required amount over time the RPS can put the electricity industry on a

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path toward increasing sustainability. Because it is a market standard, the RPS relies almost entirely on the private market for its implementation. Market implementation will result in competition, efficiency and innovation that will deliver renewable energy at the lowest possible cost.

Renewable Energy Credits, or "Credits," are central to the RPS. A Credit is a tradable certificate of proof that one kWh of electricity has been generated by a renewable-fueled source. Credits are denominated in kilowatt-hours (kWh) and are a separate commodity from the power itself. The RPS requires all electricity generators (or electricity retailers, depending on policy design) to demonstrate, through ownership of Credits, that they have supported an amount of renewable energy generation equivalent to some percentage of their total annual kWh sales. For example, if the RPS is set at 5%, and a generator sells 100,000 kWhs in a given year, the generator would need to possess 5,000 Credits at the end of that year.

A primary advantage of the RPS for promoting the commercial development of renewables is that it does not require the centralized collection and dissemination of funds or require government agencies to make decisions about winners and losers. The market makes all decisions regarding which renewable plants to build, where, and for what price. The bottom line is results: the generation of renewable power by a date certain. We can expect the market to deliver these results at the lowest possible cost.

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3.1.2 Factors for successful RPS policies

RPS policies have been established by legislation or regulation in over 10 US states, and in the countries of Australia, UK, Japan, Austria, Belgium and Italy. Texas implemented an RPS in 2000 that required the installation of 2000 MW of new renewable capacity by 2009. A combination of factors put Texas substantially ahead of schedule, with half of the targeted

capacity already in place by 2002. These factors include strong political support and regulatory commitment, predictable long-term purchase obligations, strong enforcement, production tax credit and favorable transmission access rules.

There is not a universal formula for crafting a working RPS. Differences exist with respect to the duration of the policies, the targets, enforcement methods and flexibility mechanisms. But when designed properly, as in Texas, the delivery of RE could exceed the targets in a least-cost way. The lesson to learn is the need for policy stability and long-term contracting.

Elements of an effective RPS policy:

a strong political support and regulatory commitment, and that support is expected to continue over the duration of the policy

b predictable long-term purchase obligations

c credible and automatic enforcement ensures that the penalties exceed

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the cost of compliance

d clear and well-thought-out renewable energy eligibility rules are applied

e standards are achievable given permitting challenges

f the standard is applied to electricity suppliers that are credit-worthy and are in a position to enter into long-term contracts

g favorable transmission access rules

h certificate trading, a renewable energy certificate (REC) system to validate compliance and lower the overall cost of policy compliance

3.1.3 Integrating Hong Kong's RE portfolio with Guangdong

China's Renewable Energy Law went into effect on Jan 1 2006, which stipulates that the power grid enterprises must buy electricity from renewable energy generators. It is opportune timing to consider Hong Kong's renewable energy application in the context of Guangdong's RE development.

RPS policy could be integrated in the pilot emission trading scheme with Pearl River Delta, which would help contribute to the RE targets realization in Guangdong. Mandatory Market Share, similar to RPS, which requires utilities to serve a certain amount of their electricity load with eligible renewable energy sources, is being considered in China.

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Credit trading will allow projects to be grid connected in Hong Kong or financed in Guangdong where connection to Hong Kong is optional while still offsetting coal use and improving regional air quality. Hong Kong benefits by overcoming wind siting restrictions and complications over grid access while Guangdong benefits from increased wind power economies of scale and piloting of renewable energy certificate

China has been a favorable destination for the investment in Clean Development Mechanism (CDM) projects by the Kyoto Protocol binding signatories to achieve their greenhouse gas reduction targets. The mainland has approved 22 CDM projects so far, which would reduce 46,121,632 tonnes of CO2 emission, one of them is a 45MW wind farm in Nan Ao in Guangdong.

The government could consider extending the permitted returns for the investments in the Pearl River Delta by CLP and HEC or include CDM in the future emission trading pilot scheme.

Recommendation 2: Curbing Power Growth – Demand Side Management

3.2.1 Demand side management

The demand side management activities involve a deliberate intervention by the utility in the marketplace so as to change the configuration or magnitude of the load shape like

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load management, the shifting of load from high cost to lower cost periods; strategic conservation, reductions in usage regardless of the time of use etc. DSM programs can be run by a state agency, by an independent agency operating with state funds, by private firms known as energy service companies, or by individual utilities.

DSM can be seen as a load management tool in a least-cost planning framework, in which a utility integrates planning and operation of power production facilities with the concept of actively influencing the demand for electricity. This would require that utilities develop a much closer working relationship with their customers.

There are numerous DSM programmes, innovative tariff designs and load management are two common categories:

Innovative tariff designs:

a time-of-use tariffs: involve charging higher prices for peak electricity as a way to shift demand to off-peak periods

b interruptible tariffs: offer discounts in exchange for a user commitment to reduce demand when requested by the utility

c real-time pricing: the electricity price varies continuously (or hour by hour) based on the utility's load and the different types of power plants that have to be operated to satisfy that demand

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Load management: peak shaving and valley filling

a promotion of energy efficient appliances, eg, New York State, USA, provides incentives for the installation of permanent energy-efficient equipment that will reduce a facility's peak demand

b energy storage devices located on the customer's side of the meter can be used to shift the timing of energy consumption

c Energy management control systems (EMCSs) can be used to switch electrical equipment on or off for load leveling purposes. Some EMCSs enable direct off-site control (by the utility) of user equipment. Typically applied to heating, cooling, ventilation, and lighting loads, EMCSs can also be used to invoke on-site generators, thereby reducing peak demand for grid electricity

3.2.2 Why promote DSM?

Unchecked growing consumption of energy is expensive to keep up especially when most of the energy resources are imported in Hong Kong. Measures for demand side management like energy conservation should not be overlooked especially when Hong Kong's energy consumption has shown a steady growth, 1.4% in the last decade.

The EMSD says that the implementation of mandatory Energy Efficiency Labelling

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Scheme to refrigerators, room coolers and compact fluorescent lamps could achieve an electricity saving 150Gwh per year, that is $135 million in monetary terms.

One of he IEA's 2004 publications, "30 Years of Energy Use in IEA Countries", shows that our development to our present standard of living, since the first oil-crisis in the early 70's, is mostly depending on energy efficiency improvements. Without the more effective use we would have to

use 50% more energy than we actually do today.

Many electric utilities in the United States, with the encouragement of their state regulatory agencies, are investing directly in end-use efficiency measures that will be installed by their customers. The investments that utilities have made in DSM have been typically well below the cost of equivalent supply investments per unit of electricity saved or supplied. The utilities are often assured a profit on these investments and recovery of earnings from lost sales.

The leading efforts to date have been in New England and California, where utilities typically invest 2 to 4% of operating revenues, receive financial incentives for the pursuit of DSM, and expect to reduce electricity growth considerably. For the United States as a whole, utilities spend about $2 billion per year (1% of total operating revenues) on DSM programs.

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Energy Savings for the 516 large electric utilities of the US increased to 53.7 billion kilowatt hours (kWh), 3.1 billion kWh more than in 1999. These energy savings represent 1.6 percent of annual electric sales of 3,413 billion kWh of reported sales to ultimate consumers in 2000.

US Demand-Side Management Program Energy Savings, 1993 through 2004 (Thousand megawatthours)

Item	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Total Energy Savings[1]	**54,710**	**50,265**	**54,075**	**53,936**	**53,701**	**50,563**	**49,167**	**56,406**	**61,842**	**57,421**	**52,483**	**45,294**
Energy Efficiency	52,662	48,245	52,285	52,946	52,827	49,691	48,775	55,453	59,853	55,328	49,720	41,119
Load Management	2,047	2,020	1,790	990[R]	875	872	392	953	1,989	2,093	2,763	4,175

[1] Refers to electric utilities with annual sales to ultimate customers or sales for resale greater than or equal to 150 million kilowatthours in 1998-2004 and 120 million kilowatthours in 1993-1997.

R = Revised.

Note: Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report."

Source: Department of Energy, USA, http://www.eia.doe.gov/cneaf/electricity/epa/epat9p6.html

3.2.3 DSM status in Hong Kong

Scheme of Control has made it unnecessary for CLP and HEC to invest in DSM

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programmes to manage electricity growth since expansion would do the job with a guaranteed profit. The declining-block tariff scheme for commercial end-users does nothing to ease the peak demand, and the tariffs of the domestic sector show the same indiscrimination of seasonal and daily difference in electricity demand.

The Burns and Roe Company was commissioned by the government to conduct a study on DSM in 1997, which proposed time-of-use tariffs, introduction of energy service companies, promotion of energy-saving products, and penalizing excess capacity. The estimated electricity capacity saving was 700MW.

But government remains decidedly indifferent to the proposal on DSM. The EDLB dismissed it as unrealistic for meeting electricity growth to the enquiry by the Legco on Dec 2, 1998 and was evasive about its plan for curbing electricity demand.[2]

A three-year DSM trial programme was launched in 2000 with a budget of $175,100,000 provided by CLP and HEC to promote energy efficiency in the non-domestic sector. Rebates were given for the use of energy efficient lighting and air conditioning equipment. Time-of-use tariffs were introduced to bulk users and got 5,747 participants. The EMSD organized education and information programmes. An extra $0.2 for every electricity unit was charged to the end-users to recover the cost for the DSM programme.

[2] http://www.info.gov.hk/gia/general/199812/02/1202pwrc.htm (Chinese only)

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A total of 4259 applications were received mostly from small- and medium-size enterprises. And the electricity capacity saving was 24.8MW and 121,788 kwh of electricity. About 1,400,000 units of energy saving equipment were installed. Only 83.7% of the budget was spent.

The government then decided in 2002 that the progress of the trial DSM programme was satisfactory in the non-residential sector and felt no need of extending the programme to the residential sector according to CLP's appraisal report at the end of the programme[3]. The need for consistent financial support for DSM has probably nipped the programme in the bud.

The main energy efficient promulgator in Hong Kong has to be the Electrical and Mechanical Services Department. A Decade of Energy Efficiency & Conservation, published by the EMSD in 2004 to celebrate its achievements, listed one new scheme after another, one new technology study after another, as milestones.

The technical/technology guidelines handbooks did little to address the root of the problem, namely the low awareness of energy conservation in the business sector, domestic sector and even the government institutions due to ignorance, habits, and pursuit of short-term interest have contributed to.

[3] CLP Power Demand Side Management (DSM) Programme 1 Summary Accomplishments Report (July 2000 June

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The EMSD's predisposition to technical reasoning could explain the department's deficiency of creativity with its public promotion of energy conservation. FoE (HK)'s experiences in public education of energy efficiency and conservation, tell us the problems with pitiful infiltration of various energy efficiency schemes in the private markets are: first of all, want of need, they are not required by law; second, want of incentives, old habits die hard; third, ignorance.

Nevertheless it is encouraging to note the proposal for mandatory labeling of three designated electrical appliances last summer from the EMSD, which should be in place in 2006.

3.2.4 Case Study-DSM in Thailand

In 1993, Thailand initiated a five-year (1993-1997) Demand-side Management Plan with a total budget of US$ 189 million to help curb electricity demand growth and promote more energy-efficiency equipment and cost-effective energy services within the country.

By the end of October 1997, the DSM programmes were saving 295 MW of peak demand and 1564 GWh a year of electrical energy. The reduction in carbon dioxide emissions through implementing the DSM programmes was estimated at more than 1

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million tonnes a year while investment requirement in power generation was reduced by US$295 million. The programmes also resulted in consumer savings of US$100 million a year in terms of electricity bills.

The DSM programs include:

a switching lamp production from fat tubes (40 W and 20 W) to slim tubes (36 W and 18 W) and promotion, by the Electricity Generating Authority of Thailand (EGAT), of compact fluorescent lamps instead of incandescent lamps through price differentials;

b Green Building Program: For existing buildings, EGAT carries out an energy audit, design and retrofitting of electrical systems to comply with the energy efficiency requirements set by the government. A commercial building with demand over 1MW is required to conduct compulsory energy audits. EGAT also provides interest-free loans to building owners for energy-saving modifications; through which commercial buildings can obtain compact fluorescent lamps at a subsidized price

c financial support (1996-1999): interest-free loans to purchase the level 5 (models with greater than 25% below the mean), the most efficient, air-conditioners; offered 500 Bht rebates during summer periods to shop owners selling level 5 air-cons, The number of products with energy-efficiency labels in the marketplace increased from a modest start of 46,545 in early 1995 to nearly ten times higher by the end of the year.

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Most of those products were of higher energy-efficiency levels.

d innovative tariffs: voluntary load reduction programmes to encourage load management through stand-by generation, interruptible load and time-of-use tariff schemes

e creation of Energy Conservation Promotion Fund to provide working capital, grants and subsidies to promote and facilitate energy conservation measures

Thailand's compulsory energy audit programmes, 1995-2003

Programme Area	Number of facilities	Investment (Million US$)	Annual Savings (Million US$/yr)	Annual Energy Savings (toe/yr)	Demand Savings (MW)	Simple Payback (years)
Government buildings	1,215	100.4 (2.8 audit)	15.0	297	112	6.7
Designated buildings*	1,234	154.5 (9.9 audit)	56.3	1,165	403	2.7
Factories	3,626	263.7 (8.8 audit)	185.3	3,832	547	1.4
Total	6,075	518.6 (21.5 audit)	256.6	5,294	1,062	2

*A designated building: a commercial building with demand over 1MW

*toe: tonne of oil equivalent

source: World Energy Council,

http://www.worldenergy.org/wec-geis/publications/reports/eepi/a1_energyaudits/thailanddata.asp

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3.2.5 Case Study-DSM in Japan

Japan has been applauded worldwide for its performance in energy efficiency. Energy audits are widespread. Tax incentives for new energy efficiency which allow a 30 percent additional first year depreciation as a sweetener to make those investments. Low rate loans are available for energy efficiency investments.

Events like the Energy Conservation Day, Dec 1 of every year, help keep energy efficiency in the public limelight.

One of the reasons for its high energy efficiency is the price of energy itself. Respective utility companies have designed various forms of special contract arrangements for customers to balance power demands with supply capabilities. These have been effective for load management.

Tokyo Electric Power Company (TEPCO), the main electricity supplier in Tokyo, offers various ampere contracts to the residential end-users according to the size of electric current (ampere) used by a customer. An ampere breaker would be installed in a customer's home so that the current would be cut off automatically if electricity is used beyond the contract ampere. The higher the ampere the more the basic charge. On top of this basic charge (varies from 260 yen to 1560 yen) is the energy charge that

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decides the monthly bills. For the first 120 kwh for the residential customers the tariff is 15.58 yen/kwh, about HK $1.

Types of contracts set by various utilities also include special time-of-use contract, special summer peak day/week/hour contracts, interruptible service contracts and load shift contracts.

Japan's Energy Conservation Measures and Achievements

Measures	Details of programmes	Effect
Energy Conservation Law enacted in 1979	- Mandates appointment of an licensed energy manager for high consumption- (the one with a minimum annual electricity consumption of 12 million kwh), factory and business buildings; - Mandates appointment of trained energy manager for and medium energy consumption- (the one with a minimum annual electricity consumption of 6 million kwh) factory and business buildings - Mandates submission of periodic energy performance reports	- Japan has a low rate of unit energy consumption per GDP compared to other industrialized nations, and its per-capita energy consumption in the commercial/residential sector is relatively low compared to other major countries, though the difference is narrowing down. - The savings brought about by standards for refrigerators in Japan is 63%

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	- Mandates formulation of mid- and long-term plans on energy management for high consumption buildings - Mandates rational use of energy for new buildings - Mandates energy conservation measures by non-residential buildings with an area over 2000 m^2 For machinery and equipment: - Provision of information about energy performance of the product - Labeling of designated machinery And the government has drawn up a law that would require manufacturers of air-conditioners, the heaviest drain on household electricity, to design units that consume 20% less power by 2010. Penalties for violations: either fine or imprisonment	between 1976 and 1983, and annual power consumption for refrigerators has dropped over 70% with an 87% increase in size in the two decades between 1981 and 2001.
Energy Conservation and Recycling Assistance Law, 1993	It included a variety of fiscal incentives such as tax exemptions, special depreciation	These special taxation measures boosted investment in

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	allowances and soft loans, to promote energy conservation by industry in Japan. A reduction of - 1 percent per year in energy consumption levels by all factories was one of the goals of the new law. The new equipment has to guarantee a 5% reduction in energy use to qualify for the special depreciation allowance.	energy efficient products by 500 billion yen (US$ 4 billion). Investment rose from 300 billion yen in 1990 to 800 million yen in 1993. Purchases fell back to the 300 billion yen level by 1999.
Market incentive for Energy Efficiency Promotion	Energy Efficient Product Retailer System-2003 -Efforts on energy efficiency promotion of stores are ranked and publicized annually, with the top ones awarded a logo	
Financial support to Energy Service Company	Subsidies or low-interest loans are provided to private companies to hire energy service companies for energy conservation measures	Markets for energy service have grown three times from 170 million yen in 1998 to 515 million yen in 2002.
Revolution in Office Fashion	Cool-biz, initiated by Prime Minister in the summer of 2005 to dress down and turn up the thermostat of air-cons at 28C. Companies including Toyota, Hitachi, Isuzu and Sharp asked everyone from chairmen down to salarymen to strip off their much-loved ties and jackets as office air conditioners were set no cooler than 28 C degrees.	In metropolitan Tokyo alone, the campaign saved 70 million kilowatts of power from June through August -- enough to power a city of a quarter-million people for one month, according to Tokyo Electric Power Co.

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	Warm-biz, set in motion in 2005 winter to work in unheated offices with down coats and blankets	

Source: The Energy Conservation Centre, Japan

3.2.6 What could be learned in DSM implementations for Hong Kong?

The examples above illustrate the importance of political will, financial incentives and legislation for effective DSM. FoE (HK) believes the success of energy efficiency relies on strong government initiatives and provision of both economic and public relations incentives. Implementation of DSM would enhance electricity security and energy sustainability.

Both the government and the legislature have the responsibilities to safeguard the public interest in tariff adjustments by taking into account of the performance of DSM by the electric utilities. DSM appraisal should be included when reviewing the power companies' prediction of electricity growth.

IEA says, "Demand side activities should be active elements and the first choice in all energy policy decisions designed to create more reliable and more sustainable energy systems."

Governments have a range of tools available to encourage energy conservation and

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efficiency, including adjusting energy prices, establishing financial instruments to encourage the use of efficient products and practices, mandatory minimum efficiency levels, creating voluntary programmes and energy rationing.

Some of these have been adopted in Hong Kong with the establishment of Energy Efficiency Office within the EMSD in 1994, including various energy efficiency registration schemes and voluntary labeling.

Innovative pricing like time-of-use tariffs could be introduced to bring about long term reduction in peak electricity demand. This would translate directly into reduction of overall capacity requirements, which are based on the need to supply sufficient electricity peak demand.

A standard flat rate electricity pricing exaggerates the difference between peak and off-peak demand, resulting in unnecessary expansion of capacity as well as the use of economically and environmental inefficient generation sources like coal during times of peak usage.

But as mentioned earlier, absence of political will stand in the way of DSM adoption. And lack of financial support is also detrimental to the promotion of energy efficiency. The results of the three-year DSM programme is an example of how financial support and government initiatives are essential for the success of DSM measures. The cost of

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the programme was borne by all consumers as a monthly or bimonthly DSM charge, separately identified on electricity bills, starting in Jan 2000.

Notwithstanding the insignificant savings provide insufficient incentive for the utilities to promote DSM. The annual electricity savings were less than 0.1% of total electricity sales in 2001 and the budget savings equated to less than 0.6% of CLP's and HEC's combined 2001 revenue from total electricity sales.

Utilities have an incentive to sell more electricity and a disincentive to sell less whenever the marginal revenue from a sale exceeds the marginal cost of production. Current rate-of-return regulation discourages utilities from pursuing energy-efficiency DSM programs because: (1) utilities might not recover DSM program expenses when these expenses were not anticipated in the rate-setting process; (2) utilities lost revenue from sales not made because of the success of energy-efficiency DSM programs; and (3) utilities forego other earnings opportunities because resources are devoted to DSM programs instead.

Two regulatory strategies have been developed in the United States to overcome these rate-of-return obstacles. The first compensates utilities for the margin foregone from sales "lost" as a result of cost-effective DSM programs. The second "decouples" revenue from sales. Decoupling requires establishing a revenue target that is independent of sales and creating a balancing account for the difference between

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revenues actually collected and the revenue target. The balance is cleared annually through either an increase or decrease in the subsequent year's revenue target. As a result, the utility has no incentive to increase loads and no disincentive to reduce loads because total revenues are independent of actual sales volumes in the short run.

Conclusion

Electricity market reform is not a mere economic issue but also has significant impact on public health and the environment. The heavy reliance on fossil fuel for electricity is exacerbating regional climate warming and air pollution. The government should seize the chance of the current electricity market review to plan for a sustainable energy future to improve public's health and life quality. An eco-centric energy policy which balances the pursuit for economic growth and the preservation of the environment would not only scour the filthy skies but also sustain the economic growth.

China is a vivid example to demonstrate how detrimental it is to the economy by forsaking environmental considerations. It is estimated that between eight and ten percent of China's GDP is offset by environmental damages. Some even go further to suggest that China's economic growth over the past 25 years has been cancelled out by the heavy cost to the environment and uncontrolled waste of resources.

Therefore, when deciding the objectives for future development of the electricity market,

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it would help to estimate the cost of environmental damage and medical care from a reliability-centred, which means coal-dependent, energy policy. Demand side management should be included in the new regulatory regime and the inadequacy of the current Scheme of Control for the promotion of demand side management should be redressed whatever form future restructuring may take.

The jurisdiction of a new independent regulatory body should be defined to ensure effective control.

There is a need for increased public discussion and citizen participation in the policy-making process. The government could consider open the meetings of the Energy Advisory Committee to the public or distribute meeting minutes afterwards. And information relating to the negotiations between the government and the two power companies regarding future electricity development should be made public.

Transparency should also be introduced in tariff adjustments. The terms for tariff adjustments in the SCAs are too ambiguous for the public to decipher their respective relevance to the numerical adjustments in tariff.

The advanced economic development we have in Hong Kong should oblige us a bigger proportion of responsibilities for improving regional air pollution and handling the challenges of climate change. Our lifestyles are of a developed economy but the style of our government has been one of a timid and parochial bureaucracy. The worsening

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air quality has worried a wide spectrum of community groups including the business community and the tourism industry. For a government promising strong governance, the formation of an environmental friendly energy policy is where it is most needed now.

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