

1. Introduction

Electricity appears to be lying between two seemingly incompatible domains: it invariably fuels all economic activities of the society while, on the other hand, its production process depletes non-renewable resources and aggravates pollution problems. As a tradition, supply of electricity was unambiguously classified as one of economic considerations. A stable and adequate power supply was considered as a non-negotiable need which must be satisfied to maintain the economy's competitiveness and to avoid political shocks. This explains why electricity industry remained monopolized and/or state-owned in most countries. Yet, the monopolistic structure is no longer justified when the wide range of inefficiencies unfold. This raises concerns over the limitations of the existing regulatory frameworks and creates debates on the liberalization of electricity markets in various countries.

In Hong Kong, both economic and environmental considerations will be put on the table as the local electricity policy is about to undergo reform in the near future. However, integrative study leading to a deeper understanding of the environmental politics of energy is rare. Local researches were often predominantly based on economic or engineering grounds suggesting that the existing regulatory framework is profoundly inefficient in providing economic benefits to the community but without addressing the issue from an environmental perspective. Understanding of the political

economy of energy is thus incomplete.

The present paper aims to identify the limitations associated with the electricity policy system of Hong Kong in an environmental context. Through a critical review of the policy structure as well as its rationale, it describes the interactions between the parties involved, followed by an extensive discussion of the key institutional constraints and the recently emerged socio-political pressures that would potentially pose a challenge to the development of a sustainable electricity policy. After all, this study is expected to shed light on the forthcoming regulatory reform in the territory.

2. Hong Kong: an environment under political stress

The Hong Kong Special Administrative Region (HKSAR) of the People's Republic of China extends over an area of 1084km² and has a population of 6.9 million people (2007). The territory was a British colony until 1997 when its sovereignty and administration was returned to China. Since the early 1970s, Hong Kong's economy grew rapidly but had experienced an economic downturn following the onset of the Asian financial crisis in 1997. To date it has recovered from the economic difficulties having its per capita GDP returned to US\$27600 (2006).

Hong Kong witnessed a harsh political climate after the return of the sovereignty, prompted by the unprecedented mass protest by half a million people on July 1, 2003

(Cheung, 2005; Ma, 2005). The public of Hong Kong, who was actively excluded from the political system in the colonial years, have been awakening of civil society and recognized the pursuit of democracy. Cheung (2005) points out that the cognitive gap between the Government and people has been widened since 2003, because the 'quasi-appointed' nature of the administration was incompatible to the changing social aspirations for more accountable and democratic governance. Due to the economic and fiscal difficulties, the Government also failed to secure adequate public support through economic performance. In spite of a few meritorious attempts to improve accountability of the policy system, notably the public consultation exercises for developing sustainable development strategies, democracy is still a sensitive issue given the contradiction between the notion of public participation and the executive-led system under China's rule. In fact, the administration and ultimately Beijing have given no positive response to the public appeal for election by universal suffrage and this profoundly inhibits the pace of democratic movement. The resulting people's discontent and distrust against the administration, intensified by the declining local autonomy affirmed by Beijing's unwelcome interventions in several events (Holliday et al., 2002), are invariably followed by frequent and forceful criticisms and have extended to other public affairs as well. The fact that the authority of the Government is weakened and keeps being rigorously challenged by political people

and the community at large limits its capacity of policy bargaining.

The economy of Hong Kong is characterized by a growth-oriented mentality but its prosperity is constructed at the expense of its environmental quality (Hills, 2002; Liu and Hills, 1997). Regrettably, the changes of political atmosphere give little help to embed the very principles of sustainable development into the polity. The denial of absolute democracy forms hurdles to a 'bottom-up' participatory approach underpinning sustainable development (Mottershead and La Grange, 2000). The administration, instead, turns its focus to a set of technocratic strategies for environmental management. It appears that there is a retreat of the rhetoric of administrative rationalism in the Government's agenda as it is reluctant to transform itself from a 'controller' to a 'facilitator' regime (Hills, 2004; Hills and Welford, 2002). Often, the Government manifests itself as the 'manager' for the environment and makes use of a series of 'command-and-control' measures to tackle pollution problems based on a 'top-down' model. Sustainability is understood as merely the use of technical tools to address the technical and operational dimensions of industrial processes (Hills and Barron, 1997). It is likely the technologic minds are reiterated in the emerging sustainability discourse. As explained by Hills (2004), this deeply entrenched administrative rationality is inconsistent to the very nature of sustainable development. He indicates that there is a tension between these two discourses because

sustainable development:

calls into question many of the fundamental tenets of the former [administrative rationalism], and in so doing calls into question the very *modus operandi* of the government in Hong Kong and, it must be said, the prevailing ethos of Hong Kong society. (Hills, 2004, p.34)

Public participation is consequently restricted to ‘consultation’ or, at best, ‘placation’ according to Arnstein’s ladder of citizen participation (Arnstein, 1969).

The role of the citizens is, on the other hand, ambiguous. Liu and Hills (1997) contend that the public support for a more stringent environmental regime is unclear as far as an environment-growth tradeoff is concerned. The fact that they are fairly environmentally conscious is not necessarily analogous to their actual commitments to the endeavour – the value-action gap exists (Blake, 1999). In Hong Kong, while the conflicts between environmental protection and economic growth tend to be assumed as inevitable, the former is often downplayed. An elevated role of sustainable consumption which is based on ‘bottom-up’ consumption rationality normally requiring actual contributions by consumers also comes difficult in this city.

3. The energy economy in a changing context

Since the late 1980s, mitigation of the electricity-related environmental problems has

been given a place in the government agenda. Initially it was written in the White Paper published in 1989 under the subsection of 'Air Pollution' (Government of Hong Kong, 1989). As a major component in the post-2008 electricity market reform, it appears to be welcomed by all parties, including the regulator, the electric utilities and the public. However, conflicts still exist. An understanding of the ways they tacitly define the issues helps explain why Hong Kong is likely "in a danger of locking itself into a dead end" when struggling for sustainable development as commented by Hills (2004, p.14). We start with the backgrounds of the electricity policy and then outline the policy community in a changing context to support the discussion of the factors which are incompatible to the idea of sustainability that follows.

3.1 Trends in the energy economy

Electricity played no more than economic role in the old economy of Hong Kong. Until 1981, its electricity supply was generated entirely from oil products which were subsequently substituted by coal in 1982. The substitution was considered as a measure for cushioning the growing economy against the fluctuations in energy prices. Despite coal-fired power plants were generally more polluting than oil-fired plants, it was not an issue of serious concern to the policy-makers (Chow, 1985), given that the supply of coal was more stable and its price was much cheaper than oil (Chou, 1983;

Chow, 2001b). In general, the changes in the level of electricity generated in Hong Kong are closely linked to the growth of the economy, as shown in the Figure 1 that it is rising along with the GDP level during the last two decades. The fact that nuclear power was imported from Guangdong as an alternative energy source from 1994 and natural gas was also introduced for electricity generation two years later accounted for the decline of local electricity production in the mid-1990s. Currently, the fuel mix consists of coal as the major energy source, followed by an increasing share of the relatively less polluting natural gas.

Likewise, the electricity consumption is inseparable from the structural change of the economy during this period, generally increasing with the rapid development of the economy. In addition, the pattern of sectoral consumption has undergone substantial change during this period, with the share of industries declining while commercial sector significantly rising (Figure 2). This coincided with the transformation of the economic structure over this period which was characterized by the northward movement of the manufacturing sector and the development of tertiary industry. The gentle increase in domestic consumption could be attributed to the trend of electrification in the household following the rising income levels together with the growing demand for higher comfort levels (Chow, 2001a; Hills, 1991b; Lam, 1996a).

In 2004, the sales prices of electricity in Hong Kong were 11.7 and 11.69 US

cents per kWh for households and industry respectively. International comparison shows that the prices of Hong Kong are higher than some Asian Pacific countries but lower than a few others (Table 1). The prices are however not unreasonable when considering the per capita income level and purchasing power parity of different currencies (Chow, 2001b).

It should be noted that there were a few changes in the energy economy deserving different treatments by the Government. First, the decline of the local manufacturing sector suggested a weaker lobbying pressure from the industry that held strong opposition against environmental regulation throughout 1980s. Next, the role of environmental concerns is rising despite it was insignificant in the early years. These concerns do not come from the decision makers themselves but the concerned green groups and the public who have long been excluded from the environmental policy system. Most importantly, the expansionism of electricity generation justified by the pursuit of economic development during (and before) the first half of this 20-year period is increasingly recognized as a source of both economic and environmental inefficiencies. This challenges the rationale behind the existing regulatory regime and disrupts the relationships between the utilities and other actors, and therefore creates demands for a thorough reform of the outdated electricity policy framework.

3.2 Regulatory arrangements

The energy policy is formulated by the Economic Development and Labour Bureau (EDLB) to ensure that the energy needs of the community can be met, in collaboration with the Environment, Transport and Works Bureau (ETWB) / Environmental Protection Department (EPD) which is involved in the electricity-related environmental issues. There are two broad objectives for the energy policy:

- to ensure that the energy needs of the community are met safely, efficiently and at reasonable prices; and
- to minimize the environmental impact of energy production and use and promote the efficient use and conservation of energy.

The electricity policy, until recently, remained apolitical. Traditionally it did not play any major role in the local political agenda, as the supply was highly reliable at reasonable prices and the Government did not actively involve in the ownership and management of the utilities (Hills, 1991b). But this situation is showing signs of change since the 1990s. The rationale of the current control scheme frequently got challenged due to the growing public concerns on the pricing of electricity services and the transparency of the policy system intensified by the process of democratization over the past two decades (Lam, 1997a).

In Hong Kong, electricity is supplied by two privately owned utilities: CLP Power Company Limited (CLP) (formerly known as China Light and Power Company Limited) and Hongkong Electric Company Limited (HEC). Their electricity businesses are individually subject to a rate-of-return regulation, namely the Scheme of Control Agreements (SCAs). Introduced as early as the 1960s the SCAs stipulate the financial arrangements of the utilities while they are entitled to provide reliable and adequate electricity services to the economy at reasonable prices. Financial affairs of their electricity business are subject to monitoring by the EDLB through periodic financial reviews, annual tariff and auditing reviews. The current agreements run for 15 years with two interim reviews in 1998 and 2003 and will expire by the end of 2008. No modification to the SCAs can be made without mutual agreement of the signed parties.

Under the SCAs, the two electric utilities are guaranteed a rate of return of 13.5% on their average debt-financed net fixed assets and 15% on their equity-financed assets. It is a cost-plus regulation such that any cost incurred can be recovered through annual tariff adjustment upon approval by the Government. The SCA is not an exclusive franchise; third party producer could freely enter into the electricity market to generate and distribute electric power to consumers. However, the transmission grids are currently owned and operated by the existing vertically integrated utilities, making third party entry extremely costly. This effectively prevents

competition to the electricity market and gives the two utilities a regional monopolist status.

Consistent with its conventional non-interventionist posture, the Government tends to minimize its involvement in the economic aspects of power industry. This was justified by the belief that minimal intervention could maximize economic efficiency of the power supply. Without directly intervening their operations, the administration developed a series of standards, limits or caps, such as the permitted rate of return, to allow self-adjustment by the utilities. Bureaucratic resources for monitoring and assessing the performance of the utilities are minimized by employing clear, predefined benchmarks for the authorities to determine compliance. The current SCA, as described by the Government itself, is a “simple regulatory regime with comparatively less government involvement in the business decision and operation and hence less administrative burden” (EDLB, 2003, p.3). It is for these reasons Hong Kong does not have an integrated energy bureau or department within the government machinery. And the utilities could enjoy a certain degree of freedom from close scrutiny so long as they do not go beyond the predefined boundaries.

Although the current SCAs contain a provision of environmental obligation to CLP and HEC, enforceable environmental requirement is yet specified in the agreements. There is no provision to obligate the two power companies to generate

electricity using renewable energy sources but they are subject to the emission reduction targets stipulated by the Government. As a transboundary co-operation with the government of Guangdong Province, China, the HKSAR government is bound to reduce four major air pollutants by 2010, namely, SO₂, NO_x, respirable suspended particulates and volatile organic compounds. As the major sources of these pollutants (especially SO₂), the two power companies are required by the EPD to cut down their emissions by 2010. Total emission caps are imposed on the power plants and will be gradually tightened upon the issue/renewal of Specified Process Licenses (SPLs) under the Air Pollution Control Ordinance.

In 2005, the EDLB formally proposed a reform of the regulatory framework for the electricity market in view of the SCAs coming to expire in 2008. To demonstrate its commitment of enhancing public participation, the bureau launched a two-stage public consultation exercise in January and December 2005 respectively to gauge the views of the public on various issues and possible options on the future development of the electricity market (EDLB, 2005a, 2005b).

In brief, the recommendations made by the EDLB involve relaxing the regulatory constraints about introducing new power supplies and imposing more stringent control over the existing utilities. The consultation has stimulated a debate on the future prospect of the electricity market, mainly around market liberalization issues.

Arguments for increasing competition are typically drawn on the potentials of higher economic efficiency in power generation (Democratic Party, 2006; Lam, 1997a, 2004; Liberal Party, 2006) or of improving environmental performance (Friends of the Earth, 2005; Greenpeace China, 2006b; Hui, 2003; Ng, 2004; The Conservancy Association, 2000), or both (Bronstein, 2003). Concerns on the possible economic impacts (Chan, 2006; Woo et al., 2006) and the complexity of the regulatory framework required (Civic Exchange and CLSA, 2003) constitute the conservative arguments on the other side. While this proposal has set the scene for wider use of economic incentives for emissions mitigation, it gives no hint to the transformation of the electricity supply-demand dynamic underpinning the idea of sustainability.

3.3 The energy triangle

Typical energy policy community consists of a network involving the energy authority and a small number of monopolist or oligopolist energy suppliers plus environmental and consumer organizations (Owen, 1999). This section outlines this energy triangle in Hong Kong to support the analysis later in this paper.

The regulator

As a tradition the Government tended to minimize its involvement in the local

electricity industry (Hills, 1991a, b). Unlike many well-developed countries, the electricity industry of Hong Kong has been dominated by private entities and the policy makers once believed that a reliable and adequate electricity supply was associated with minimal intervention. The government officials maintained a co-operative relationship with the utilities and were sceptical to make big changes from the status quo (Chan, 2006). This strategy had probably worked well in the *laissez-faire* economy of Hong Kong prior to 1990s in terms of the contributions to economic growth. However, it is inveighed for failing to answer the pressing environmental problems, particularly after the local political environment becomes unprecedentedly complicated. Frequently bombarded by social activists the Government is forced to look for some changes as a response, which in turn puts the relationship with the power industry into a new shape. This constitutes a new energy political economy in the territory.

In Hong Kong, there does not have single independent agency within the government machinery to oversee all aspects of the electricity matters. Responsibilities are divided among a few loosely allied government departments and organizations. Each of them attends to a specific set of the issues and is expected to demonstrate some degree of intra-governmental co-operation.

The role of the Government as the regulator is mainly represented by the EDLB¹. It plays a dual role for formulation and execution of electricity policy and is responsible for determining the rules of the game by engaging in the bilateral SCAs and monitoring compliance of the utilities to these rules, which covers the development plans of generation and network and tariff levels. Very often, economic considerations take precedence over others, given that EDLB is a department designated to economic policy. On power generation it tends to focus exclusively on economic aspects with minimal consideration to environmental impacts. This characterizes the economic rationality deeply embedded in the policy manipulation of Hong Kong throughout the past decades.

The EPD acts as a key player to fulfill the second broad objective. After the reorganization in 2005, it takes up a dual role of for the formulation and execution of environmental policy. Within the department there does not have a separate unit dealing with environmental problems arising from power generation, but an Air Policy Division that covers a variety of air issues, including those related to energy. Another unit involved is the newly established Conservation Division for promoting renewable energy and energy efficiency. As a tradition, the department tends to take a ‘command-and-control’ approach for tackling electricity-related air pollution problems,

¹ The role as the regulator had been transferred to the Environment Bureau newly established in July 2007

despite an emission trading pilot scheme is belatedly introduced in the early 2007.

As an executive arm of the ETWB, the Electrical and Mechanical Services Department (EMSD) serves to provide technical support for the manipulation of energy policy, including the SCAs, and enforces the Electricity Ordinance to ensure the compliance of the utilities. Regarding energy supply and consumption, the EMSD is in charge of introducing technological innovations to the community, government departments and private sector, prompted by the establishment of the Energy Efficiency Office in 1994. However, since the Conservation Division of the EPD is also involved in energy efficiency and conservation initiatives, it runs a risk of creating overlapping between the duties of the two departments.

Furthermore, there are two advisory bodies involved. Established in 1996, the Energy Advisory Committee (EAC) is a non-statutory advisory body for providing advice on energy policy. The membership of the EAC reflects the professionalism adopted by the Government in handling energy issues (Lam, 1998). It is suggested that the Government simply treats energy efficiency and conservation issues as technological or engineering problems without adequate social insights. Given its advisory nature, the EAC has no actual power in policy implementation which is dominated by the government officials. The other one is the Council for Sustainable Development (CSD) established in 2003 to promote sustainable development in Hong

Kong on a broader strategic level. What is different from previous institutions is that the CSD emerged as a more open institution allowing wider public participation. Promotion of renewable energy is identified as an area of particular concern under the First Sustainable Development Strategy for Hong Kong (First Strategy) (CSD, 2005).

The electric utilities

Electricity supply in Hong Kong is provided by the CLP and HEC, both of which have been privatized right their inception. At the time the economy was rapidly growing, they were posited as economic actors supporting all commercial activities and assumed a key role in the economy. The CLP and HEC entered into the SCAs since 1964 and 1979 respectively. As an alternative to a nationalization plan proposed in the late 1950s, the SCA emerged as a measure to balance the interests of the consumers and the utilities (Lam, 1997a). The utilities do not possess franchise to supply electricity in Hong Kong and new comers are free to enter the market. However, new suppliers have never emerged and currently there is no direct competition between the two utilities. Both of them are vertically integrated companies, i.e. they own and operate their respective generation, transmission and distribution assets in their service areas. This suggests that electricity provision in Hong Kong is highly centralized.

With respect to environmental commitment the two utilities are not completely

irresponsive. They shows positive attitudes to sustainability principles but remain defensive by claiming that they must in some circumstances make “difficult decisions” between social, environmental and economic interests (CLP, 2004b, p.17). The “difficult decisions”, as the utilities suggest, involve the impacts on supply reliability that citizens are most concerned about (Charles River Associates, 2004; CLP, 2006; Exxonmobil Energy Limited, 2006; HEC, 2006).

Their efforts on environmental improvement have made a certain degree of success in the mitigation of SO₂ and NO_x emissions. Promotion of renewable energy is an area of high priority in their environmental policy, followed by some other supply-side technological measures for emission mitigation and awareness-raising educational programmes (CLP, 2004b; HEC, 2005). Such attempts and plans are either charismatic in the sense that they can easily draw the attention of the general public, or essentially supply-led involving little demand-side participation which sounds more complicated and difficult to manage (their DSM activities are largely limited to large customers). The initiatives on energy efficiency outlined in the CLP Environmental Manifesto (CLP, 2004a), however, appear rhetoric and consider the inefficient use of energy as a matter of lack of awareness rather than lack of capacity to respond. This indicates a difference from the idea of the DSM put forward during the 1990s and the early 2000s (CLP, 1991a; CLP, 2000; ESB, 1997; HEC, 2000).

The consumers, political parties and pressure groups

The public of Hong Kong traditionally placed little value on environmental issues (Barron, 1996; Hills, 1985). Nevertheless, environmental concerns on energy issues have been growing since the 1990s (Hills, 1991a). The public holds the view that the existing regulatory arrangements fail to satisfy both economic and environmental objectives at the same time. Particularly after the economic downturn, they see no reason for the two large power companies to keep earning an attractive guaranteed return while remain irresponsive to their concerns. The public is also becoming more aware of the citizenship along with the democratic movement. Public views are as a result likely given more weight in the manipulation of electricity policy.

Nevertheless, the public views contain self-contradictory elements. Unlike in the early years, the people not only demand reliable and adequate supply of electricity at reasonable prices but also better environmental performance of the utilities. Paradoxically, the consumers rank environmental considerations far lower than economic aspects. In a survey, there were only 3.7% of the household respondents indicating environmental concerns as the most important aspect of electricity provision, compared to the 49.7% on supply reliability; a similar result was also obtained in another survey conducted for commercial and industrial consumers (Table 2).

Moreover, it was observed that there exists a gap between awareness and actions for domestic consumers, but it looked more consistent for commercial and industrial consumers in another survey. A total of 63.6% of the household respondents supported introduction of renewable energy by the Government but only 31.9% would choose to use if available (Census and Statistics Department, 2004), compared to the 89.1% and 88.9% respectively for commercial and industrial consumers (EDLB, 2004), showing that the domestic consumers were more hesitant to commit. It was generally because, according to the EDLB (2005b), they worried about having to pay a higher tariff and the reliability issue associated with imported renewable energy from Mainland China. Given the predominant economic concerns, the EMSD (2002) admitted that it is too early to expect substantial support from the general public for the use of sustainable energy sources. This dilemma is indicative of an inherent collective action problem associated with electricity provision that influences the behaviours of other actors, especially the elected officials.

The public's attitude has been amplified by political parties and pressure groups who actively involve in the ongoing debates on behalf of public interests. Most of the political parties strongly support a liberalization of electricity market mainly because of the potential tariff reduction (and wider choice as well) (see e.g. Democratic Party, 2006; Liberal Party, 2006). And this is advocated by the environmental NGOs to

different extents (see e.g. Friends of the Earth, 2005; Greenpeace China, 2006b; The Conservancy Association, 2000), in spite of the potential environmental drawbacks from lower tariffs. As the existence of these organizations is subject to the support from the public, they have incentives to accuse the utilities and the Government of their failure to address economic and/or environmental efficiencies. In a Legislative Council (LegCo) meeting, it is suggested that the utilities have full obligation to offer cheaper and cleaner electric power even without attractive returns as compensation (LegCo, 2006). These actors, who support a radical restructuring of the power industry, are effectively taking a supply-oriented perspective based on the principle of ‘polluter pays’ but not ‘user pays’. Public views are regarded as a justification of their oppositional approaches against the closed, elitist infrastructural and, ultimately, policy system. However, the arguments of the politicians are sometimes self-contradictory. For example, some LegCo members insisted on removal of the SCAs which guarantee the return of the electric utilities, they, on the other hand, advocated a profit control scheme be imposed on the unregulated towngas company (Lam, 1997a). After all, this has significantly sharpened the provider-consumer relationship drawing a clear-cut boundary between the two sides.

The relationships reshaped

In the early years there was little conflict between the utilities and the Government (and other actors as well). It is because the utilities' business objectives were not at odd with the social aspirations that were mainly concerned about the capacity to meet people's basic needs. In fact, the industry was subject to public pressure of increasing electricity supply to fuel the rapidly growing economy (Chou, 1983). It legitimized an expansionary energy policy and led to a regulatory framework that effectively encouraged capacity expansion of power generation.

Since the 1990s the expansionism, however, never got unchallenged. Due to the declining energy demand which was overlooked by the decision makers and the rising environmental concerns, the utilities were criticized for continually expanding the generating capacity, causing over-consumption of non-renewable energy resources and aggravating pollution problems. As the providers of a utility service they are expected by the public to demonstrate commitments to social responsibility. However, the two utilities, being private monopolists, remain active but defensive in responding to the social pressure. The Government, which is supposed to take care of the diverse interests of the stakeholders, is inevitably busy in resolving the conflicts. This situation is inherent because if the government officials:

allow to set the price too high, they impose a burden on consumers. But if they set prices too low, they deprive the power companies of reasonable

return of investment and capital to build new power plants. If they endorse the construction of power plants, they may threaten the public health and environment. But if they reject or defer proposals for new power plants, they may run the risk of insufficient capacity for future development. If they fail to encourage efficient use and conservation of energy, they aggravate the supply problems. But if they promote energy efficiency and conservation, it entails higher electricity tariff and hence exacerbates the charge burden of consumers (Lam, 1998, p.58).

As a consequence, the current energy economy of Hong Kong is characterized by a situation that the weak Government is being pulled in different directions by the political activists, the noisy NGOs, the defensive electric utilities, and ultimately, the more conscious consumers.

Historically, the relationship between the Government and the utilities was built on the formal bilateral contracts, i.e. SCAs, while direct negotiation between the utilities and consumers did not normally exist. Alongside the changes of political and economic conditions, the private and public interests appear to be divided. Bound to the agreements the utilities presume that it is a zero-sum game to balance reliability, tariff reduction and environmental protection, which is however not shared by the public. This creates an oppositional relationship built on distrust that discourages the

formation of informal consensual linkage.

The worse thing is that the Government finds no effective solution to strike the balance. It is likely that the utilities, and to a lesser extent the Government itself, are often viewed as both the causes and solutions of the problems. The officials tend to simply ‘cap and control’ the industry because it involves minimal intervention, less regulatory costs and probably more visible results. Scarcely few measures designated to bring about actual demand-side commitment can be found in the existing electricity policy regime and the consultation exercises for the restructuring.

4. Sources of incompatibilities

4.1 Constraints of regulatory mechanisms

Criticisms of the SCA for its incompatibility with environmental considerations are always central to the debates. As a bilateral contract formulated more than thirty years ago, it fails to catch up with the changes of the local environmental contexts, and its long-term nature also creates barriers for effective bargaining. The regulatory constraints have discouraged promotion of energy efficiency as well as wider supply sources.

Primarily the SCAs were designed to encourage expansion of generation capacity in order to ensure stability and adequacy of electricity supply. It links average

net fixed assets to the utilities' permitted returns, i.e. the more the investment in generation capacities the higher the returns. The SCAs require each of the two utilities to set up a development fund to finance their acquisition of fixed assets and stabilize tariffs. Any shortfalls between the actual profit after taxation and the permitted return will be transferred to or from the fund. When there is unexpected growth in electricity demand, the fund accumulates and a larger fund will then be available for acquiring fixed assets to meet the growing demand by which the utilities are entitled a higher permitted return. Lam (1997b) suggests that this arrangement provides incentives for the utilities to improve operational efficiency and, a rather negative one, to over-expand their production capacity. The utilities thus have every incentive to encourage a continuing growth in demand to justify the expansion of generation capacity, and this explains why they always make over-optimistic demand forecast and have low interests in demand management which would in effect reduce their permitted returns (Hills, 1991a, 1991b; Lam, 1996b).

The regulatory arrangements contain insufficient provisions to allow wider customers' choice on supply (Ngan et al., 2006). As specified in Supply Rules of the two power companies, the customers must take all their required electricity from the utility and an internal generating unit that runs in parallel with the company's supply is prohibited (CLP, 1991b; HEC, 1992). This considerably limits the introduction of

renewable energy sources from other suppliers (Close, 1997). In addition, since the incentive structure of the existing SCAs only caters for traditional energy sources, it fails encourage the power companies to adopt renewable energy, such as landfill gas (EMSD, 2002). Thus, the regulatory arrangements have created barriers to on-site generation using the environmentally friendly technologies and alternative energy sources, which ultimately discourage investment in decentralized environmental innovations.

Under-priced electricity would give no signal on its real cost and dampen the incentives for efficient use of energy. Compared to most neighbouring countries where there were various kind of subsidies to the power industry, the energy prices in Hong Kong by the 1990s were relatively low (Hills, 1991a). Until the late 1990s, both of the utilities adopted declining-block tariff structure, which means that the average unit cost per kilowatt-hour falls as the consumption increases, thus discouraging demand management. The current pricing of electricity, on the other hand, does not account for the externalities and environmental costs associated with combustion of fossil fuel (Hui, 2003). This makes the conventional methods of power generation relatively cheaper than those generated from renewable energy sources which are at present not formally subsidized by the Government or the consumers. Development of generation capacity employing renewable energy therefore remains slow.

4.2 Fragmentation of bureaucratic arrangements

The Hong Kong's approach to environmental protection has been notoriously characterized by the fragmentation of responsibilities within the bureaucratic system (Hills, 1985; Hills and Barron, 1997; Welford et al., 2006). This makes the environmental policy rather piecemeal without adequate integration and currently it still constitutes a major weakness of its electricity policy to which each responsible department attends to a specific set of issues and intra-governmental co-ordination is weak in the absence of an integrated energy bureau (Mottershead, 2004). In fact, the responsibilities reside with a number of departments and bureaus, with the EDLB, EPD and EMSD being active players in the electricity policy community. They are expected to be functionally complementary and demonstrate meticulous co-operation. Generally, the electricity issues are divided into three subfields, i.e. economic, environmental and technical (mainly safety), which are handled by the officers in the EDLB, EPD and EMSD respectively. Negotiation with the power companies on the SCAs, for example, are led by the EDLB for financial arrangements while subject to the inputs from the EPD for the environmental performances of the companies as well as from the EMSD for the safety in the supply and use of electricity (EDLB, 2005b). EPD virtually did not play any substantial role until the 1990s.

Arguably, the Government has adopted a technocratic approach by relying on different groups of experts in these departments. The problems about electricity supply are viewed as a market failure requiring a specific set of remedial measures by a group of specialist bureaucrats. Thus, in the early years, the SCA was treated as a purely economic arrangement while the rising emission levels due to power generation was classified as a pollution problems resolvable by scientific means. However, this arrangement is rather piecemeal, and the departments operating in isolation are oblivious of the interrelationship between their respective areas and merely deal with the symptoms rather than the causes of problems. Sometimes their policy initiatives may fit well to their own concerned areas but at the expense of the others. For instance, as an economic policy agency the EDLB has prioritized reliability issues for which it decided to retain the rate-of-return regulation which will invariably remain as a major barrier to the emission reduction targets pursued by the EPD and to energy efficiency by the EMSD. The same also applies when the EDLB takes a strong position to lower tariff. So, it is likely that the provision of electricity in Hong Kong as a cross-sectoral issue is still under fragmented control by the loosely allied bureaucratic organizations creating inconsistency of policy in some cases.

4.3 Production-focused Approach

Reliance on supply-side regulation

Hills (1985) notes that it is paradoxical that the tradition of non-interventionism of the colonial administration did not extend to its environmental decision-making. Increasingly, the SCA is found problematic as far as environmental issues are concerned. Concerns over the inconsistency between the non-interventionist economic regulatory settings and the environmental objectives related to the air pollution problems arising from power plants and the overexpansion of generation capacity grew since the 1990s. This is interpreted as demands for stronger environmental control over power generation. As a response, the administration adopted the 'command-and-control' approach which has been applied to tackle many other pollution problems (Barron, 1996; Hills and Barron, 1997). During this period, a series of policy initiatives has been developed with mixed results, generally including:

- Requiring the power companies use the best practicable means to reduce emissions as required in the APCO and at the same time enhance the operational efficiency of the power plants and the combustion and generation efficiencies;
- Requiring the power companies to use low sulphur coal for all the existing coal-fired generating units;
- Banning the construction of new coal-fired generating units since 1997;

- Setting emission caps in any SPLs issued or renewed to power companies under the APCO; and
- Encouraging the power companies consider adopting the most effective economic tools (including emissions trading) to achieve the emission reduction targets. (EPD, 2006)

With these initiatives specifically designed to regulate power industry by capping and controlling production aspects with the aid of technological capacity, the policy-makers believe that the environmental objectives can be more than fulfilled by redesigning the production processes. This technological optimism is based on the presumption that “all consumption-related environmental problems can ultimately be solved through technical inventiveness” (Murphy and Cohen, 2001). Murphy (2001) criticizes that environmental policy is often designed as production-focused, typically involving mitigative measures to directly control the emissions from industrial installations. It is often assumed that environmental improvement is a function of industrial processes only as the problems are understood as largely production-related rather than consumption-related. Policy-makers tend to narrowly view environmental problem as technical problem more than an outcome of a complicated social process. This simplistic, atomistic view is described by Murphy and Cohen:

[t]he technologist’s key assumption is that all consumption-related

environmental problems can ultimately be solved through technical inventiveness. This assumption is grounded in a view that sees society as a machine whose purpose is to meet human needs. As such, the key constitutive social relationships involve resource and materials flows, energy inputs and outputs. The ultimate goal is to make the system as efficient as possible in its use of resources and energy. Technological innovation is central to this project. The economist simplifies the individual by assuming a limited number of universal characteristics; the technologist lose sight of the individual and society, except as the recipient of final goods and services or as a source of problems to be solved. (Murphy and Cohen, 2001, p.10).

The result of this technologist's view is an emphasis of supply-led initiatives. Such focus fails to account for the fact that consumption is not necessarily determined by production. A positive change in supply side may have little to do with resolving a consumption- related environmental problem.

Hills (2004) argue that the environmental policy of Hong Kong is deeply rooted in the notion of 'administrative rationalism'. The case of Hong Kong is basically administrative-led, emphasizing the role of expert and the technologic perspectives with scant demand-side participation. It is unlikely that this administrative mind will

fade out as the dominant role of ‘command-and-control’ approaches is reaffirmed in the Stage I Consultation Paper. Though questionable, it is considered effective by the Government who has no intention to re-assess the predominant role of the regulation-based regime that involves less cost of monitoring and minimal intervention, as it did in 1990s (Barron, 1996). In the Stage II Consultation Paper the economic bureau makes this more explicit:

Experience has shown that the mandatory licensing arrangements have been effective for improving the environmental performance of power companies in Hong Kong. We propose that environmental regulation continue to be applied in the future electricity market (EDLB, 2005b, p.14).

While one may wonder how ‘effective’ it has been and in what manner the regulatory approaches will ‘continue’ to take lead in the environmental decision-making, this production rationality has been embodied in the First Strategy, in which four specific measures are devised for achieving sustainable use of energy:

- To work with the power companies and other stakeholders to organize more education campaigns on renewable energy;
- To establish by 2006 a policy on the installation of renewable energy facilities as part of new Government buildings and major public sector projects;
- To work with the power companies on arrangements for simplifying

procedures for renewable suppliers to gain access to the existing electricity grid, with the aim of having appropriate procedures in place in the post 2008 electricity market, and to encourage them to use renewable energy sources for power generation; and

- To draw up by 2007 a sustainable energy policy that has regard to measures aimed at promoting the use of renewable energy and encouraging energy efficiency and conservation. (CSD, 2005)

The action plan bears a faith that the environmental practices taken by the producers will be analogously instrumental to encourage positive changes in consumers' behaviours. Educational initiatives are important but in most cases they are insufficient to bring about substantial actions due to the existence of value-action gap. Likewise, allowing third party access to electricity grid makes renewable energy supply available but it does not mean profitable and hence viable, given the consumers' skepticism of shifting to renewable power. Suggestions for promoting energy efficiency are also vague. The CSD attempted to build consensus among stakeholders through consultation exercises, but little was done to enable demand-side commitment underpinning sustainable infrastructure that is essentially based on transformation of supply-demand dynamic.

The ETWB shares this rationale as reflected in the two key environmental

initiatives about energy outlined in the Policy Agenda 06-07, i.e., continuing to monitor the power companies on the development of renewable energy and impose emission caps onto power plants (ETWB, 2006). This is echoed by the Action Blue Sky Campaign (Campaign) launched in 2006 by the Government to demonstrate its commitment of improving air quality. Having a strong political vigor, the Campaign highlights the responsibility of the utilities to meet the emission targets. According to Dr. Sarah Liao, the former Secretary for ETWB, the first and perhaps the most important strategy is to:

[S]et clear targets and milestones, taking into full consideration the need to strike a balance between protecting the environment and sustaining economic and social development, while harnessing technological advancement and economic tools to accelerate their attainment. (Liao, 2006)

Clearly this strategy is preoccupied with the idea of technological optimism. No matter for meeting political needs or truly for environmental reasons, these initiatives confirm the belief that to ‘command and control’ remains as the major responsibility of the Government as it did since thirty years ago. The unadjusted presumption legitimizes the use of tougher regulation which, as it believes, was and will be capable of overcoming most, if not all, of the electricity-related environmental problems. This is indicative of a ‘controller’ regime in managing the environmental aspects, as opposed

to a 'facilitator state' (Rydin and Pennington, 2000).

Demand-side initiatives being limited

Although consumption-focused initiatives have been given a place somewhere in the government environmental agenda, they are considerably limited in numbers and effectiveness. Prior to 2000s, public participation was absent in electricity policy-making which was entirely determined by administrative decisions and the consumers were assumed to be captive recipients of electricity. To date, the public is still uninvolved in most cases; recent examples include the selection of sites for building liquefied natural gas receiving terminal by the CLP.

During the 1990s, the Government had shown some interests in promoting DSM which was once a policy objective stated in the Economic Services Bureau (ESB) (the then EDLB)'s Policy Objective (ESB, 1998). However, its energy efficiency programmes are still piecemeal as admitted by the CSD (2006). In 2000, the EDLB entered into a short-term additional agreement with each of the utilities for implementation of the DSM Programme during mid 2000-2003. The Programme targeted on industrial customers and aimed to encourage efficient use of electricity so that installation of additional generation capacity by the utilities could be deferred or avoided, thereby reducing the environmental impacts arising from power generation.

Financial incentives were provided to both electricity users and the utilities for this purpose. The Programme consisted of two parts: the rebate programmes - providing rebate to non-residential customers to encourage installation of energy efficient lighting and air-conditioning equipment; and the non-rebate programmes – including time-of-use tariff programme, educational and promotional activities, and market survey to gauge the public’s views on DSM (ESB, 1999a). The program costs were recovered by a DSM charge collected from all consumers in the monthly electricity bills.

For its consumption-based perspectives, the Programme was a breakthrough comparing to the supply-led measures conventionally employed. However, there was little success particularly in motivating the utilities to actively take part in demand management. In fact, the performance of the Programme was, at best, modest. Although the Energy Savings have outperformed the expected levels, the actual Capacity Savings for both the utilities only slightly exceeded the targets approved by the authority prior to implementation, and there were some individual items performed far lower than the targets (Table 3). It had diverse participation rates which were regarded as an outcome of the poorly designed rebate rates (Lee and Yik, 2002). Also, the Programme was “largely cosmetic” and did not have significant effect on the consumption (Bronstein, 2003). In fact, the annual energy savings have been minimal;

it accounted for only 0.21% of the electricity sales (Table 4). In their respective accomplishment reports both utilities showed very little interest of extending the programmes to residential customers as planned (CLP, 2003; HEC, 2003). Not surprisingly, it is because the idea of DSM was inconsistent to the rationale behind the SCAs which restricted the effectiveness of these programmes.

Moreover, there is a tendency for the Government to rely on educational and informational measures to encourage changes in consumption. Coverage on energy efficiency and conservation can be found in the Campaign but it is unlikely that it can make itself immune from the problem of disparity between awareness and action when the Campaign is merely taken as an educational and publicity campaign. The EPD has proposed a series of awareness-raising measures including the establishment of a voluntary Energy Conservation Charter to encourage more efficient use of energy. However, the proposal on energy efficiency and conservation has included every possible suggestion for individuals except concrete incentives. With respect to electricity issues, it appears as a re-emphasis of the environmental responsibility of every member of the public by using a checklist of 'dos' and 'don'ts', which is however not much different from the educational programmes that the department implemented from time to time. Policy for promoting sustainable consumption should be nurtured from well understanding of the *process* – the ways that the unsustainable

practices evolve and are socially constructed (Southerton et al., 2004). But this perspective is unclear in this plan which has a rhetorical focus on the role of consumers and placed inadequate considerations on the practical barriers and the means to influence the embedded nature of consumption practices.

Perhaps, the only encouraging attempt is the recent proposal of a mandatory Energy Efficiency Labelling Scheme submitted to the LegCo in 2006. However, it is a belated attempt as it remained as a voluntary programme for as long as 12 years and the new one is not expected to work out in details until 2008. The voluntary programme is not effective either, especially for products like television sets and washing machines which have market penetration rates of around 10% only (EPD, 2005). Furthermore, development of renewable energy supply on demand side is tremendously slow. EMSD (2002) has reported that there are few small-scale projects undertaken by the public or private organizations. While they are mainly used for demonstration, the demonstration impact is rather limited since they are fixed to obscure locations. The situation is made even worse by the absence of a mechanism to enable small customers to buy and support energy from renewable sources as discussed previously.

In Hong Kong, the environmental impacts of power generation are often understood as mainly a technical problem. The policy-makers believe that expanding

its controlling capacity is effective for overcoming the associated environmental problems. Given the current political environment it is likely that the Government has become much more susceptible to public views than the past. It is thus not surprising that the bureaucrats are interested in using these 'hard' technologic policy tools that could more easily produce visible results for assessment in a fixed period of time. Compared to DSM, development of renewable energy looks more attractive to decision makers. Since it is physically more 'eye-catching' and charismatic, it is regarded as a more effective tool to vividly advertise their commitment to the environment and more than welcomed by the bureaucrats now when the public pressure is rapidly rising. On the flip side, DSM appears to be complicated because it inevitably involves direct and sometimes costly contributions by consumers; it may also require radical changes in the regulatory framework to decouple profits from electricity sales. Demand-side initiatives have the potentials to allow timely collaborative actions between providers and consumers, but a supply-led measure like adjustment of permitted rate of return will have little to do about this. In view of the socio-political reality, the administration tends to rely on tightening of the emission standards and a centralized renewable energy policy at large. Private-public partnership is underdeveloped. In this sense, it is strengthening supply capacity rather than building the capacity of demand by giving consumers the incentives plus the means to makes changes in consumption. It looks at

the products or by-products (i.e. emissions) but not the social process of power supply. Consequently, consumers are likely to remain captive and their environmental awareness finds no way translate into actions through consumption decision-making directly.

4.4 Pro-development

The fact that environmental consideration is peripheral to the electricity policy of Hong Kong is inseparable from its development history. Economic development was an overriding concern in the economy where environmental protection was acceptable only if it did not compromise economic growth (Barron, 1996; Hung, 1997). Since electricity was viewed as a necessary element of economic development, the early electricity policy was designed to serve economic purposes exclusively. As a matter of fact, it was the industrial lobbying concerning the unreasonably high electricity cost in the 1950-60s prompted a reinforcement of the regulation on the power companies to control the price and the rate of return (Cameron, 1982). Under this context the SCA was first implemented in 1964, which effectively created a favourable financial condition to the regulated utilities as an exchange for their provision of adequate and reliable power supply at a competitive price. It had benefited the industrialization thereafter by the relatively low tariffs for industrial users.

The high degree of electrification and rapid urbanization in Hong Kong had given rise to the heavy reliance on electric power, making the economy susceptible to reliability issues (Chan, 2006). Given the dominant concern of enhancing the economy's competitiveness, reliability and tariff issues often receive more emphasis in the electricity policy-making process than environmental impacts. This is exacerbated by the fact that the negotiation of the SCAs is in the hands of a purely economic agency (i.e. EDLB).

Environmental aspects have been marginalized until the 1990s. It is partly because the electricity policy was often under the influence of the powerful industrial lobbying groups. The fact that energy did not occupy a major portion of household expenditure giving it a low priority to most users also affected the incentive to conserve (Hills, 1991b). Initially implemented in the 1970s, energy conservation measures were justified solely by economic reasons, i.e. to prevent the economy from power shortage (Chou, 1983). The same reasons also explained the shift of fuel mix in the early 1980s in which environmental concerns played a very limited role (Chow, 1985). Satisfying the enormous growth in energy demand in the early 1990s was in fact a reason for the colonial government's approval of increasing generation capacity by the power companies, which was however subsequently found to be excessive and wasteful (Chow, 2001b).

There is recently a shift in policy targets from the industry to the community due to the decline of the industrial sector and the slow but influential democratic movement as well. Unlike in the early years when the regulatory decisions were determined by political elites, the public sentiments are given more weight on the current electricity debates. Nevertheless, environmental aspect is still ranked far lower than the economic significances of electricity. It is therefore not surprising that the arguments of the public and politicians in the debates of electricity market reform largely concerned with development and, in some cases, implicitly at odd with the environmental concerns raised by the same groups of actors.

As discussed above, one of the reasons for supporting a liberalization of the electricity market is tariff reduction which is considered both economically and socially desirable. Policy initiatives were thus made closer to this social aspiration as a reaction to the public sentiments. As the Government reiterated its aim to minimize the costs to the consumers as far as possible, one of the means to achieve this target is a downward adjustment of the rate of return (and consequently, tariff levels) for the utilities' emission reduction facilities. However, low electricity prices would normally discourage efforts of energy conservation. Hills (1991a) suggests that the electricity prices in Hong Kong should be adjusted upwards rather than the reverse for energy efficiency initiatives to be effective. This shows that while everyone except the utilities

are keen on lowering the tariff, either the nature of demand may have been overlooked or, more likely, it is simply taken as a political gesture to secure acceptance by the community. As pointed out by Albert Lai, the former Director of The Conservancy Association, electricity consumers are the actual polluter of electricity-related pollution problems (LegCo, 2006, p.14). But under the current socio-political atmosphere, it seems that the bureaucrats do not see themselves in a right position to question the consumption sovereignty of the citizens without tormenting the notorious power companies first. As such, the Government is politically motivated to develop a development-oriented electricity policy to manifest itself as more responsive to the public metabolism to secure better acceptance by the community, even if it may run counter to the second policy objectives involving energy efficiency.

4.5 Suppression of private interests

Pressures to suppress private interests of the utilities in the recent years do not stem from the bureaucrats directly but the elected politicians and the pressure groups. Whilst the SCAs are deemed effective to maintain reliability, it is rather protective to the utilities and so frequently criticized. The privately owned utilities are often accused of not taking up the environmental responsibility while making a huge sum of money at the same time.

The DSM Programme

This can be illustrated with the DSM Programme implemented in 2000 to which the utilities showed little enthusiasm probably because of limited gains incurred. At the initial stage, a total incentive earning of \$76 million (equivalent to 0.23% of the total sales revenue in 2001) was proposed to allow the utilities to earn a return comparable to that they would have earned if they had instead added generating capacity and transmission and distribution facilities, while obliging them to undertake DSM measures for three consecutive years (ESB, 1999b). However, it was abandoned before implemented due to the concerns of the LegCo members who were sceptical to legitimize such an extra profit to be made by the utilities and allow them to take an enhancement of social and environmental well-beings as a business opportunity. One of them “doubted the rationale of providing incentive earnings to the power companies which effectively guaranteed the power companies’ profit level despite the implementation of DSM” (LegCo, 1999, para. 27). This was eventually accepted by the power companies on a condition that they would not be penalized in shortfall in target savings as previously agreed.

Implementation of DSM involves program costs *plus* revenue losses and risks. An effective incentive mechanism should contain not only full cost recovery but also

adjustment of lost revenues and an above-cost bonus to offset risks (Gellings and Chamberlin, 1993). It is therefore unlikely that the DSM Programme would fall into the utilities' private interests without reasonable compensations. After the Programme was completed, both of them were inclined not to extend the Programme to residential sector as planned for the reason that public awareness on energy efficiency and conservation has already been raised 'significantly'.

The Stage II Consultation

Distrusts over the power companies are extended to the recent debates on the electricity market reform. In a LegCo panel meeting, it was suggested by a member of LegCo that:

[i]nstead of discharging their corporate responsibility to improve emission performance, the power companies were using emission reduction facilities as tools for bargaining better terms for their SCAs, such as higher rate of return and longer duration, where were contrary to public aspirations.

(LegCo, 2006, p. 11)

Greenpeace China (2006a) shared this view and quoted a comment from the Secretary for ETWB:

the power companies make profits by running this business. Pollution

control is part of their production cost. It should be internalized, and the cost burden shouldn't be shifted to the consumers² (Greenpeace China, 2006a, p.28).

The Secretary denied environmental improvement as a product but a non-compensable duty of the industry. It is the intention of these actors and the public as well that the largest part, if not all, of the costs of environmental initiatives should be borne by the utilities but definitely not the public. Some suggest that it is impossible to work with the utilities for promotion of energy conservation without thorough reform of the policy and imposition of punitive measures on the companies (LegCo, 2005, p.3187). In short, these actors are doubtful about the proposition that the Government should act as a facilitator or moderator in the electricity market (Greenpeace China, 2006b).

As the senior government officials have become politically more sensitive to public reactions after a series of policy failures and the changes in socio-political environment in the past few years, they are frequently under a pressure to impose tougher regulation on the power industry. Yet, on the other hand, it actually prefers minimizing intervention over the operation of the industry. Under this situation, it finally takes a moderate option to balance public and private interests by proposing a lower rate of return (7%) for emission reduction facilities. Nevertheless, it is criticized

² Quoted from an interview aired on 26th February, 2006 with "Hong Kong Connection", a documentary programme of Radio Television Hong Kong. The original comment was made in Chinese.

that the lower rate would still give little incentive to the utilities to install these facilities or they would be unable to obtain funds to support the investments (Woo et al., 2006). This approach sounds reasonable from the consumers' point of view but may probably be helpless to environmental improvement.

At present, the confrontational positions of the politicians and pressure groups and to a lesser extent the Government remain a major barrier. The Secretary for ETWB suggested that if the utilities fail to meet the environmental standards, the Government should "be tough, fine them, apply heavier fines to make them panic"³ (Wong, 2006). This has, however, almost led to a collapse of the relationship with the utilities (Yung, 2006). Sustainable development goes beyond controls and needs collaborative and consensual actions by different groups of actors; but it does not help if a government simply hides behind the social consensus and acquiesces in confrontation rather than collaboration between private and public sectors. Regrettably this is currently the way they interact in Hong Kong: confrontation frequently appeared in policy debates while collaboration limited to 'window-dressing' educational and promotional activities. This gives rise to low incentive to promote environmental innovations as the private interests are intentionally suppressed.

³ The original comment was made in Chinese.

5. Conclusion

The reasons why the sustainable electricity policy in Hong Kong remains underdeveloped go beyond shortages of environmental awareness or private commitment to the common goods as often said. Supply-demand relations are ill-constructed in a way that everyone is fairly aware but nobody has the motivation of taking truly meaningful actions. It stems from the path-dependant institutional setups that restrict a timely transformation, in conjunction with the Government's treatment that does not look beyond these structural constraints, more appreciating scientific and economic rationalities than communicative actions.

Everything starts from the regulatory constraints inherited from the development paths of Hong Kong. The city has never given environmental endeavour the same priority as economic growth; particularly at the time of economic downturn, no official can afford to undermine growth for the sake of environmental protection. Cross-sectoral sustainability imperatives are at odd with its conventional administrative culture and have been handled in a piecemeal manner, and apparently, this has been extended to the realm of electricity. These constraints inevitably breed critiques from the concerned parties along with the growing public awareness and the (yet successful) democratic movement. These then turns to an emphasis of the role of utilities as the contributors of the causes as well as the solutions and a view that

environmental gains are a function of a unidirectional, 'one-to-one' relationship between the government and utilities. Local community, however, has never been convinced that environmental protection should be taken as a reason for making more profits if the citizens' living will be affected. Consequently, the Government as a reactive party deals with the problems mechanistically, while the utilities' private interests are posited as a grave conflict to the social objectives. Communicative actions exist only on the consultation documents but not in the policy.

From a broader perspective, the Government's treatment of electricity policy is a reflection of the local environmental discourse. With respect to environmental management, it is reluctant to move away from a 'controller' regime and seems to return to the technical dimensions of sustainability (Hills and Welford, 2002; Hills, 2004). Policies addressing the socially constructed consumption practices that need 'bottom-up' demand-side commitment earn little credit. The weakened Government is inclined to play a stronger role in controlling the industrial operations of electricity provision which involve less costs and are more welcomed by taxpayers, rather than prompting substantial behavioural changes in consumption which are normally politically more costly as this often challenges consumption sovereignty (Murphy, 2001). Extension of the production-focused approach is thus more preferred given such political agenda.

The Hong Kong energy economy is inevitably framed by this situation: electricity provision appears as a conflict between production and consumption sides; while there are certain degree of improvements in the power generation processes, promotion of sustainable energy consumption remains rhetoric and ineffective in the absence of political commitment. As such, it has constituted, at best, only the first half of the notion of sustainable development. What is in need is building up more positive, collaborative relationships between the utilities, and the Government and the consumers in particular. Opportunities for negotiation and a more equitable distribution of responsibility between the stakeholders should be given a heavier role in the new agenda (Blake, 1999). However, we do not expect this will happen tomorrow because the minimal progress in democratic development in near future and the extension of the utilities' monopolist status are going to ruin the 'trust' between them and this compounds the guilt of those regulatory constraints. (10,694 words)

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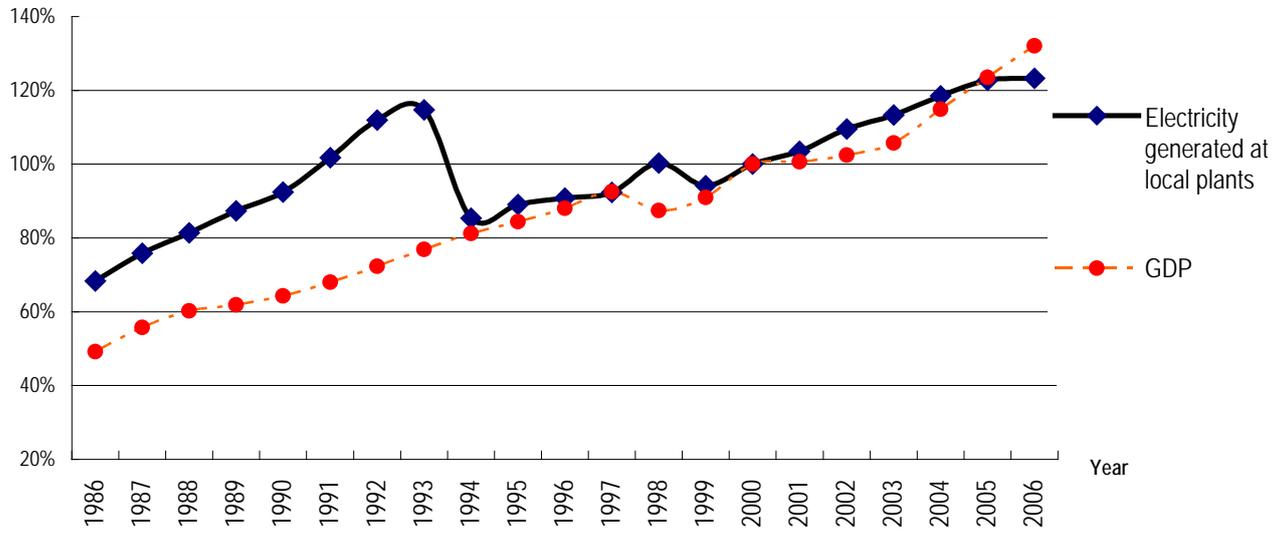
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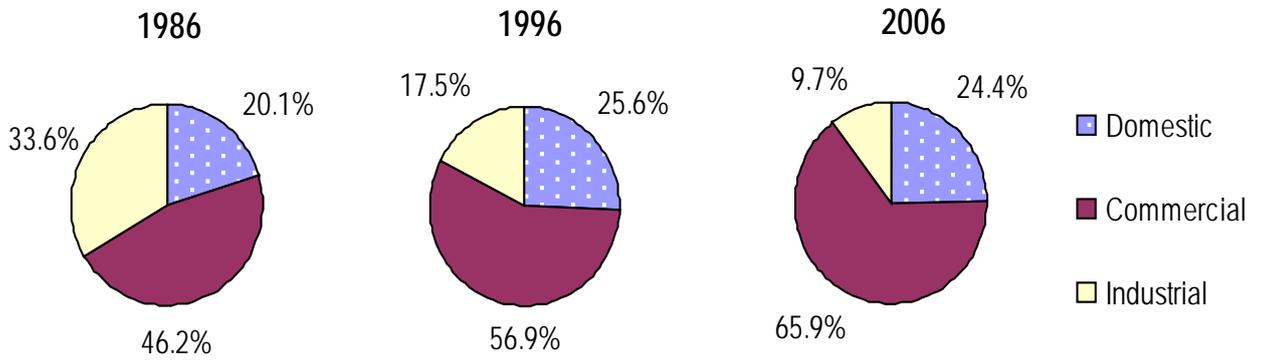
Figure 1. Comparison of local electricity production to the GDP level, 1986 – 2006.

Percentage change (base year 2000)



Source: Census and Statistics Department, Hong Kong Statistics.

Figure 2. Sectoral Consumption of electricity in 1986, 1996 and 2006.



Source: Census and Statistics Department, Hong Kong Statistics.

Table 1: Electricity prices of Hong Kong and selected countries in 2004.

Electricity Prices for Households and Industry in 2004 (US cents per kWh)		
Country	Households	Industry
Australia	9.80	6.10
Hong Kong	11.70	11.69
Japan	19.60	12.70
Korea	7.90	5.30
New Zealand	12.00	5.10
Taiwan	7.60	5.50
Thailand	7.00	6.30
United Kingdom	13.80	6.70
United States*	9.00	5.30

**excluding taxes*

Sources: Hong Kong: Census and Statistics Department, Hong Kong Energy Statistics 2006; Others: International Energy Agency, Energy Prices and Taxes 2006.

Table 2. Aspect of electricity supply considered to be the most important by the Hong Kong consumers.

Aspect of electricity supply considered to be the most important	Domestic consumers	Commercial and industrial consumers
Reliable and stable electricity supply	49.7%	57.8%
Low electricity tariff ⁴	34.5%	15.6%
Availability of choice of electricity suppliers	6.8%	13.5%
Good customer services	3.8%	4.9%
More environmentally sustainable energy sources ⁴	3.7%	4.2%
Simple tariff structure	1.6%	4.0%

Sources: Domestic: Census and Statistics Department (2004), Thematic Household Survey Report No. 17; Commercial and industrial: EDLB (2004), Electricity Supply in Hong Kong: Establishment Survey.

⁴ The survey for commercial and industrial consumers used other terms with similar meanings instead - 'reasonable electricity charges' and 'choice of electricity produced by renewable energy sources' respectively.

Table 3. Performances of the DSM Programmes undertaken by CLP and HEC.

Programme	Capacity Savings (MW)				Energy Savings (MWh)			
	CLP		HEC		CLP		HEC	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
<u>Lighting Rebate Programme</u>								
Non-residential CFL (Retrofit)	5.53	4.86	0.11	0.73	12,714	21,739	1,010	7,070
Non-residential CFL (New)	0.75	1.26	0.11	0.23	1,726	6,117	1,010	1,220
Non-residential EEFT (Retrofit)	3.02	1.96	0.07	1.03	7,584	7,296	290	4,500
Non-residential EEFT (New)	2.46	0.95	0.07	0.17	6,165	2,970	290	510
Non-residential EB (Retrofit)	3.77	14.62	4.21	5.96	9,472	79,329	15,840	30,460
Non-residential EB (New)	5.67	0.78	3.78	0.20	14,208	3,024	12,040	970
<u>HVAC Rebate Programme</u>	1.81	0.33	1.43	1.48	8,978	1,312	5,330	5,450
Total	23.01	24.76	9.78	9.80	60,847	121,787	35,810	50,180

Sources: CLP (2003), DSM Programme Summary Accomplishment Report; HEC (2003), DSM Activity Report.

Table 4. Annual energy saving from the DSM Programme in the electricity consumption.

Annual Energy Savings from the Rebate Programme (MWh)			Electricity Consumption in 2000 (Non-residential users) (MWh) ⁵	Proportion of Energy Saving in Electricity Consumption
CLP	HEC	Total		
40,595	16,726	57,321	27,344,722	0.21%

Sources: CLP (2003), DSM Programme Summary Accomplishment Report; HEC (2003), DSM Activity Report; Census and Statistics Department, Hong Kong Energy Statistics 2006.

⁵ *expressed in Terajoule in the original document*