



香港電燈有限公司  
*The Hongkong Electric Co., Ltd.*



## EXECUTIVE SUMMARY

Submission on Stage I Consultation  
Future Development of the  
Electricity Market in Hong Kong

## 1 Introduction

The Hongkong Electric Co., Ltd. (HEC) is pleased to provide this submission in response to the Government's Stage I Consultation Paper on Future Development of the Electricity Market in Hong Kong.

Since the release of the Consultation Paper in January 2005, HEC has been actively soliciting the views of its major stakeholders and carrying out extensive research on market reform in other jurisdictions. Accordingly, this submission is based on HEC's own hands-on operating experience in overseas power markets, feedback from various stakeholders, and findings from careful research.

HEC has been supplying electricity to Hong Kong Island for over 110 years, and has a demonstrated commitment to safely providing a reliable, efficient and adequate electricity supply to its customers.

HEC owns the Lamma Power Station which is located on a 50-hectare site at Po Lo Tsui at Lamma Island. This station provides electricity supply to Hong Kong Island, Ap Lei Chau and Lamma Island. In order to meet future demand for electricity on a timely basis, HEC has constructed a 22-hectare extension site to the Lamma Power Station to accommodate six additional gas-fired generating units. The first unit will be commissioned in 2006.

HEC has been operating in the Hong Kong market under the Scheme of Control Agreement (SCA) since 1979. HEC appreciates the Government's recognition of HEC's efforts and contribution to Hong Kong's development made under these arrangements.

As a key stakeholder in the Hong Kong electricity market, HEC welcomes this review and the opportunity to provide experience-based input for the future development of the market.

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## 2 Executive Summary

### 2.1 A crucial issue: reliability vs new risks

The 2008 SCA renewal presents the Government with the opportunity to review the successes of the past as well as consider new approaches that would continue to offer a reliable and economically efficient power supply for Hong Kong's future.

In an environment of continuing economic uncertainty, rising fuel prices and increasing environmental pressures, HEC recognizes that the Government and the community face a delicate task in balancing a range of often competing objectives.

However, paramount amongst these is the undisputed fact that the outstanding reliability achieved by Hong Kong's power companies over the SCA periods has been a vital contributor to Hong Kong's economic progress and prosperity. As many countries that have experimented with market reform have discovered to their detriment and chagrin, reliable power supply is very easy to take for granted but very difficult to fix once compromised.

**Reliable power supply is very easy to take for granted but very difficult to fix once compromised.**

### 2.2 HEC's approach: benefits vs risks and costs

As one of two incumbent power companies and with billions of dollars already invested in the Hong Kong power industry, HEC obviously has much at stake in the outcome of the current consultation process. HEC's shareholders and financiers therefore have more than just a legitimate interest in ensuring that the value of their existing investments is maintained and that HEC remains able to attract future funds at competitive rates.

However, HEC's shareholders and financiers ultimately share a common goal with Hong Kong's power consumers. A safe and secure power system that continues to deliver Hong Kong's exemplary reliability levels is only achievable if investors and financiers continue to have confidence in the regulatory arrangements governing the power industry.

As an investor-owned utility that has delivered world-leading levels of reliability, HEC believes that the current regime should only be amended where it can be clearly demonstrated that the benefits of the change outweigh the risks and costs.

**Exemplary reliability levels are only achievable if there is confidence in the regulatory arrangements.**

### 2.3 The Consultation Paper: a useful starting point

HEC commends the Government on its wide-ranging Consultation Paper, which provides a useful starting point for the 2008 SCA renewal process.

The Consultation Paper identifies the Government's policy objectives, which can be expressed as follows:

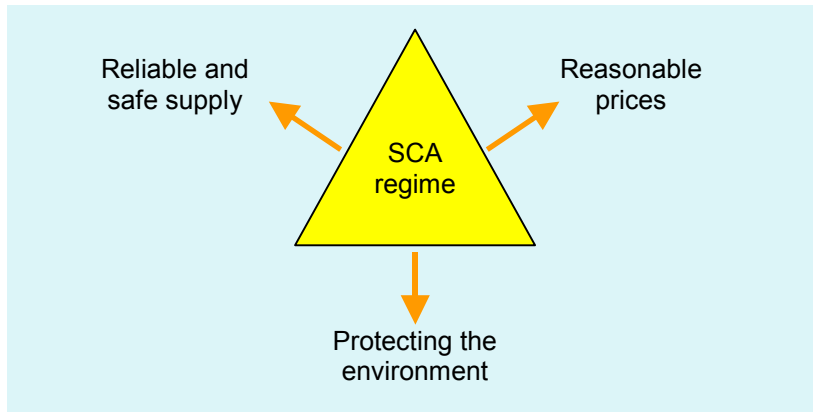


Figure 1: Government's policy objectives

In summary form, the objectives are:

- **reliable and safe supply** - reliable electricity supply is vital to the economic activity and everyday life in Hong Kong;
- **reasonable prices** - reliability must be balanced with price outcomes; and
- **protecting the environment** - minimising pollution (and improving air quality) and greenhouse gas emissions.

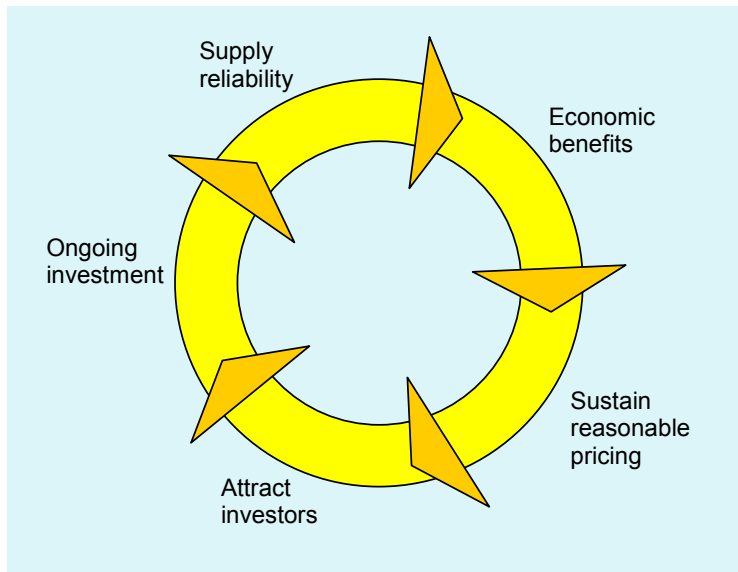
HEC agrees that these represent a realistic and sensible suite of policy objectives. However, as highlighted in the Consultation Paper, these objectives are sometimes in conflict. Ultimately, the most challenging issue will be the need to resolve these competing tensions.

### 2.4 Issues are interlinked: the virtuous circle

This submission sets out HEC's views on the issues raised in the Consultation Paper.

If the Consultation Paper is any guide, most attention will be devoted to the question of how best to achieve reliable supply at reasonable prices. It is indisputable that considerable economic benefits flow from a reliable power system. On the contrary, less attractive returns to investors in the power industry can result in economic consequences of under-investment that are very serious.

HEC sees these issues as inextricably linked in a “virtuous circle”, which can be represented as follows:



**Figure 2: The virtuous circle**

Importantly:

- there is no natural “starting point” in the circle - no element has priority;
- each element of the circle is dependent on all the other elements; and
- adjusting one element can have significant (and often unforeseen) effects on the other elements.

In this context, the various issues raised in the Consultation Paper can be seen as a set of interlinked issues.

## 2.5 Meeting the Government’s key policy objectives

### *Reliability*

The Government notes:

*“We enjoy a high level of supply reliability that currently exceeds 99.99% which is among the highest in the world...”<sup>1</sup>*

This level of reliability is necessary for advanced economies that have become increasingly dependent on a secure and adequate electricity supply.

<sup>1</sup> Consultation Paper, p 6.

Hong Kong has high-density and high-rise living and a heavy reliance on elevators and electrified transportation systems. According to a recent high-rise building survey<sup>2</sup> which ranks 100 international cities according to the total number of floors of their high-rise buildings, Hong Kong has been ranked first. Hong Kong is followed by New York City and Seoul as a distant second and third respectively (as shown in Figure 3). Further, because of Hong Kong's climate, there is also a high penetration of air-conditioning which is considered crucial to lifestyle and working environments. Hong Kong people are also demanding, and they expect the highest standards to be maintained at all times.

Rank	City	Population	Buildings <sup>a</sup>	Points <sup>b</sup>	Reliability <sup>c</sup>
<b>1</b>	<b>Hong Kong</b>	<b>6,787,000</b>	<b>7,422</b>	<b>114,486</b>	<b>99.99+%</b>
2	New York City	8,115,135	5,444	35,406	99.9992%
3	Seoul	10,331,244	2,831	15,590	99.9963%
5	Singapore	3,437,300	3,503	13,147	99.9998%
7	Tokyo	8,130,408	2,069	9,223	99.9977%
14	Sydney	4,201,500	802	4,073	99.9909%
23	London	7,172,036	1,295	2,741	99.9931%
36	Paris	2,152,467	248	1,785	99.9968%
52	Taipei	2,719,293	152	1,228	99.9991%

Notes:

a) A high-rise building is defined as a building 35 meters or greater in height, which is divided at regular intervals into occupiable levels.

b) Points per Building:

12 - 19 floors = 1 point	60 - 69 floors = 200 points
20 - 29 floors = 5 points	70 - 79 floors = 300 points
30 - 39 floors = 25 points	80 - 89 floors = 400 points
40 - 49 floors = 50 points	90 - 99 floors = 500 points
50 - 59 floors = 100 points	100+ floors = 600 points

c) 2003/04 figures from web research.

**Figure 3: High-rise building survey and supply reliability of major cities, April 2005**

The importance of reliable electricity to a metropolitan city cannot be emphasized enough. In fact, Hong Kong is not alone in this aspect. Manhattan Island of New York City, another metropolitan city and a leading world-class financial centre whose service territory is similar to that of Hong Kong, also warrants high supply reliability.

Although the lower planning criteria for HEC require a lower investment level than New York's, HEC has been able to maintain the same level of reliability (i.e. 99.999%) as New York's since 1997. This has been a result of good asset management skills, thorough planning, quality construction, and the regular training of operating and maintenance staff on top of timely and sensible investments.

<sup>2</sup> Emporis (April 2005), [www.emporis.com](http://www.emporis.com).

**Hong Kong people are demanding and they expect the highest standards to be maintained at all times, particularly given Hong Kong's position on this high-rise building chart.**

### *Reasonable prices*

The Consultation Paper shows<sup>3</sup>:

- in general, electricity bills account for less than 2% of the general household expenditure for residential customers;
- a recent survey indicates electricity bills constitute less than 10% of the monthly operating costs for the majority (77%) of the non-residential customers surveyed; and
- HEC's residential tariffs are in the middle range when compared to those of other major cities and only higher than those of the state-owned utilities in Singapore and Taipei.

Further, an analysis<sup>4</sup> has shown that increases in HEC tariffs have been well below CPI increases since 1983, the first full operating year of Lamma Power Station (even though this has included an unusual period of deflation in Hong Kong).

**HEC tariff increases have been well below CPI increases since 1983 even though this has included an unusual period of deflation in Hong Kong.**

### *Environment*

The SCA has shown itself to be a particularly efficient and effective mechanism for the Government to implement its environmental policies, and energy efficiency and conservation programmes while maintaining appropriate tariff levels.

In a deregulated regime in which competition is based on the marginal costs of generation, utilities have no incentive at all to improve the environmental facilities and performance of their generation plants.

However, under the stable operating environment created by the SCA, HEC has been making significant environmental achievements and its efforts are well-recognized.

- HEC is presently installing the first commercial scale wind turbine in Hong Kong.

<sup>3</sup> Consultation Paper, pp 6-8.

<sup>4</sup> Figure 13 in Section 5.3 of the Full Submission.

- HEC's first gas-fired generating unit is under construction and will use liquefied natural gas (LNG), which is an environmentally friendly fuel with low emissions.
- For its coal-fired units, HEC is the first power utility in the whole of Asia (except Japan) to introduce flue gas desulphurization (FGD) plant in 1993 to reduce SO<sub>2</sub> emissions significantly. In addition to FGD plants, HEC has also installed low-NO<sub>x</sub> burners and electrostatic precipitators to reduce NO<sub>x</sub> and particulates emission.

Of course, environmental objectives need to be balanced against the additional costs they impose. This is a case where there is a tension between the objectives of reasonable tariffs and emission reductions and so the caps imposed on emissions from generators must be practical and achievable at a reasonable cost.

**The SCA has shown itself to be a particularly efficient and effective mechanism for the Government to implement its environmental policies.**

## 2.6 Electricity as an imperative

Electricity is an essential service; it is not a luxury. It is a critical input into the creation and provision of all goods and services. Reliability of supply is indispensable to a modern and competitive economy and to ensuring continued economic growth.

*“Today, the use of electricity is both indispensable to modern life and an essential part of our very well being. However, it has become so pervasive that it is “transparent” to most consumers, at least until there is an outage. Were it possible to turn off our entire electric power system for a few hours, and assess the impact, the full measure of electricity’s role in the economy would become evident. Few processes other than some space heating, most transportation, and agriculture would continue to function, and even then poorly, constituting a loss of about \$1 billion per hour. The entire economy would stop.”<sup>5</sup>*

A business competitiveness survey conducted by the Chinese University of Hong Kong in 2004 indicated reliable supply is a very important consideration in deciding where to set up business and that reliability is more important than tariff levels.<sup>6</sup>

<sup>5</sup> S. Massoud Amin and Clark W. Gellings 2005. “The North American power delivery system: balancing market restructuring and environmental economics with infrastructure security.” *Energy-The International Journal*, forthcoming.

<sup>6</sup> The Chinese University of Hong Kong and Lingnan University “A Report on the Survey of the Cost Competitiveness of Hong Kong Businesses” (October 2004).



Despite this, it is only when the “lights go out” that the importance of reliability is recognized. For example, the blackout in 2003 affecting the Eastern U.S. and Canada resulted in an estimated economic loss of up to US\$10 billion.<sup>7</sup>

**It is only when the “lights go out” that the importance of reliability is recognized. The 2003 blackout across the Eastern U.S. and Canada resulted in an estimated economic loss of up to US\$10 billion.**

## 2.7 Reliability cannot be sacrificed for lower tariffs

Ultimately, there is a trade-off between the level of reliability and the level of tariffs. HEC is of the view that the current balance between reliability and tariffs is appropriate.

To the community, each unit of electricity costs around HK\$1. However, for each unit of electricity unserved, the cost to the community from stoppages of various social and business activities is many times higher. A very conservative estimate of such cost in the U.S. is about HK\$40 per unit.<sup>8</sup>

This can be best illustrated by considering a hypothetical example of Hong Kong’s supply reliability declining from 99.99+% to 99.00% - that would result in a 1% probability of service interruption, or about 87 expected unserved hours per customer per year. Based on the 2004 annual reports of Hongkong Electric Holdings and CLP Holdings, Hong Kong’s average demand per hour is about 4,478 MW. The 1% reliability deterioration would cost the entire community of Hong Kong approximately HK\$15 billion per year.<sup>9</sup>

In trying to strike the right balance, it is imperative that the Government ensures that Hong Kong’s electricity systems are reliable. International experience has shown that the economic impacts of under-investment in electricity infrastructure flowing from returns being set too low are extremely high and costly. As such, there should be a bias towards ensuring reliability when balancing the trade-off between reliability and costs.

**HEC is of the view that the current balance between reliability and tariffs is appropriate, e.g. 1% less reliability could cost Hong Kong \$15 billion per year.**

<sup>7</sup> U.S. - Canada Power System Outage Task Force “*Final Report on the August 14, 2003 Blackout in the United States and Canada*” (April 2004) p 1.

<sup>8</sup> See Woo and Pupp (1992) for a survey of outage costs in the U.S. As a comparison, the system average outage cost of PG&E in 1992 was estimated to be US\$17 per unit of electricity unserved (Keane and Woo, 1992). The figure used by the National Grid (U.K.) in 2000 was £2.816 per unit of electricity unserved (Roques, Newbery and Nuttal, 2005, p 6).

<sup>9</sup> 4,478 MW per hour x 87.6 hours unserved per year x HK\$40,000/MWh unserved is about HK\$15 billion per year.

## 2.8 International experience: lessons from experimentation

The last 20 years have seen extensive electricity market restructuring, deregulation and new methods of regulation. As noted by the Government in its review of other economies, electricity market reform has led to mixed outcomes.<sup>10</sup>

There are a number of lessons to be learned from the reform experience of other countries.

- Electricity is unlike any other commodity in that it cannot be stored and demand and supply must be kept in balance at all times. This means that, unlike other commodity markets, deregulated electricity markets are very complex.
- Electricity is demand inelastic but supply and demand has to be continuously and instantaneously balanced. The electricity markets are therefore particularly susceptible to abuse of market power. Indeed, it has been claimed that most wholesale electricity markets around the world are subject to the abuse of market power by large firms.<sup>11</sup>
- As recognized by the Government, there is no universal model for market reform and local factors must be taken into account.<sup>12</sup>
- The costs of getting market reform wrong are enormous. The costs of the failed Californian market reform are more than US\$50 billion.<sup>13</sup>
- The impact of regulation cannot be overstated. Inappropriate regulation has led to systematic under-investment in a number of countries with consequent infrastructure failure at a huge cost to society.<sup>14</sup>
- The complexities of reformed markets mean that they propagate new regulations and regulatory staff. These institutions and arrangements are expensive to establish and maintain. The costs are generally measured in tens of millions, if not hundreds of millions, of dollars.<sup>15</sup> Ultimately, these costs are priced into tariffs and passed through to consumers.

Of course, the negative experiences of other countries do not mean that changes or adjustments should be rejected out of hand. However, they do highlight the risks and costs involved, and Hong Kong therefore needs to act with extreme caution.

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<sup>10</sup> Consultation Paper, p 10.

<sup>11</sup> Fabra N and Harbord D, "Market Power in Electricity Markets: An Overview of the Theoretical and Empirical Literature" (2001).

<sup>12</sup> Consultation Paper, p 10.

<sup>13</sup> Lave, L.B., J. Apt and S. Blumsack (2004) "Rethinking electricity deregulation", Electricity Journal 17(8): p 11.

<sup>14</sup> Refer to Appendix 1 of the Full Submission.

<sup>15</sup> Refer to Appendix 2 of the Full Submission.

Changes, if any, need to be carefully thought out and introduced incrementally. This would ensure that the Government can assess whether the anticipated benefits have actually arisen at each stage. The Government could then decide whether it should proceed further.

As part of this process, the first few steps or changes also need to be reversible. Hong Kong's power suppliers have made huge investments in long-term infrastructure and a significant cost of reform in other jurisdictions has been stranded costs related to sunk investments made on the basis of the old regime. If major changes are contemplated, these costs should be minimized or even avoided by a measured and proper transition. Further, once an inappropriate regulatory system has been introduced, it would be very difficult and costly to unravel it, and that invariably would lead to an erosion of confidence in the new arrangements by all stakeholders.

**Many lessons have been learnt at enormous and unprecedented costs. Experimentation must be avoided.**

## 2.9 Perceived problems: HEC's responses

The Government identified the following criticisms of the SCA<sup>16</sup>:

- the permitted rates of return are considered high in the present day economic climate;
- the permitted return, based on fixed assets, is perceived to have encouraged over-investment;
- the permitted rate of return fixed over a 15-year period lacks flexibility, as amendments to the SCA cannot be made without the consent of the parties involved; and
- the annual tariff and auditing reviews lack transparency.

HEC believes that these “problems” are overstated and arise from an incomplete understanding of the SCA and the environment in which electricity infrastructure providers operate. Each of these issues is considered in detail in the relevant sections of this submission but HEC's responses can be summarized as follows:

- Permitted return: All things considered, the existing permitted return has proved to be reasonable to investors, sufficient to attract investment, and has provided electricity supply at reasonable tariff, high reliability, and excellent services.

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<sup>16</sup> Consultation Paper, p 9.

- Investment level: HEC's investment in electricity infrastructure has been prudent and timely under the regulatory scrutiny of the Government. Furthermore, any over-investment would have been penalized by an excess capacity adjustment that would be deducted from the permitted return.
- SCA time-frame: As recognized by the Government, the uncertainties arising from a shorter agreement period would deter continued or longer term investment by the power companies. Given the long-term nature of investment in electricity infrastructure and the long-term take-or-pay gas supply contracts, the current 15-year regulatory period is appropriate.
- Transparency: HEC is willing to work with the Government further on increasing the transparency of the tariff setting process, subject to full confidentiality for commercially sensitive information that is passed to the regulator.

**HEC believes that these “problems” are overstated and arise from an incomplete understanding of the SCA and the environment in which electricity infrastructure providers operate.**

## **2.10 ‘Possible’ options: ‘benefits’ do not necessarily outweigh costs**

The Consultation Paper suggests the following possible options:

- (a) modifying the SCA by adopting new regulatory mechanisms;
- (b) introducing a new regime involving one or all the options of increased interconnection, new supply sources and open grid access; and
- (c) a new legislative framework and institutions.

HEC is concerned that many proponents for change see reform as a means to an end, namely the lowering of tariffs. Nevertheless, the costs incurred for the changes may actually be higher than the benefits, if indeed there were benefits to be derived. In fact, international experience has shown tariff reductions, even if realized, are often transitory and at the cost of poorly maintained systems which are incapable of meeting future demands. Market reform in California is a classic example where rates were mandated to fall but the ultimate cost to consumers and the State far exceeded those temporary benefits. The failure of electricity restructuring in Ontario is another well-documented example.<sup>17</sup>

The risks and benefits of each possible option are considered elsewhere in this submission. While HEC acknowledges that some of the options (if implemented properly) could give rise to benefits, HEC is of the view that these benefits do not clearly outweigh the costs or the risks that they introduce.

<sup>17</sup> Woo, C.K., D. Lloyd, and A. Tishler. 2003. “Electricity market reform failures: UK, Norway, Alberta and California.” *Energy Policy* 31(11): 1103-1115; Trebilcock, M.J., and R. Hrab. 2005. “Electricity restructuring in Ontario,” *Energy Journal* 26(1): p 123-146.

As a general comment, each of these options introduces a greater level of complexity and will be expensive to implement and maintain. These costs will be significant and must be factored into the analysis.

The consultation debate must not be driven by ideology – that one form of industry structure or regulation is superior to another. There is no perfect model; each model has its flaws and limitations. In changing the regulatory regime, Hong Kong will simply replace one set of issues with another set - this potentially leads to a downward spiral of ever increasing regulation.

Changes, if any, should produce outcomes that are demonstrably superior to the outcomes under the existing regime.

### **Change must not be for the sake of change.**

#### **2.11 Specific issues raised in Consultation Paper**

A summary of HEC's comments in relation to each of the specific issues raised in the Consultation Paper is set out below.

##### ***Return on investment: ROA most appropriate***

HEC is of the view that the criticisms of its return under the SCA are misconceived. HEC's 13.5% return is a "nominal" return (i.e. without reference to inflation) and applies equally to generation, transmission and distribution assets. The general misconception is attributed to the 6-9% return in the U.K. and Australia quoted in the Consultation Paper.<sup>18</sup> First of all, these rates of return are "real" rates (i.e. apply to inflation adjusted asset base). Secondly, HEC's tariff, which results from the SCA formula of cost pass-through and HEC's return, is less than the tariff charged to, for example, London consumers as tabulated in the Consultation Paper.<sup>19</sup> The London tariff is arrived at by similar cost pass-through arrangements and a combination of a market driven return on generation assets, and an "inflation adjusted return" on transmission and distribution assets. The fact that HEC's tariff is lower than the London tariff demonstrates that HEC's return is not out of step with rates of return in other jurisdictions. Indeed, when proper comparisons are made, taking into account the difference between "nominal" and "real" returns and the market return earned on generation assets, it is evident that HEC's return is reasonable.

HEC first signed the SCA in 1979. HEC's 13.5% return under the SCA since 1979 is again proved reasonable when taking into account the actual market conditions. Over the 26-year period between 1979 and 2004, the average inflation rate is 5.8% while the average best lending rate is 9.24%.

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<sup>18</sup> Consultation Paper, p 16.

<sup>19</sup> Consultation Paper, p 8.

One of the issues that appears to have been lost in the debate over HEC's rate of return under the SCA is that *the return is not a guaranteed return*. In fact, over recent years, HEC has substantially under-recovered the revenue needed to enable it to earn the permitted return under the SCA. A substantial proportion of this under-recovery was a result of HEC agreeing to ease the tariff pressure on consumers and to assist in the recovery of Hong Kong's economy.

HEC's tariffs are in line with tariffs in OECD (Organisation for Economic Cooperation and Development) countries and other major cities. In addition, Hong Kong consumers enjoy a higher level of reliability for their tariffs than customers in other cities.

The existing SCA has provided appropriate incentives for investment in electricity infrastructure. At the same time, the excess capacity adjustment on permitted return has ensured that over-investment would be penalized.

HEC agrees with the Government that the Equity Base Approach lacks incentive for efficient financing, e.g. under-utilization of debt capital. The Asset Base Approach, on the other hand, provides incentives to ensure continued and adequate asset investment and has been widely adopted in the network businesses of the U.K. and Australia.

On the determination of the rate of return, the cost of capital approach considered in the Consultation Paper would add an extra layer of complexity and cost to the tariff setting arrangements. It provides no guarantee that appropriate investment incentives will exist to induce adequate investment in supply infrastructure for maintaining the existing level of reliability.

However, if changes to the return on investment regime were to be contemplated, the Government must take into account the fact that HEC has made substantial sunk investments on the basis of achieving a certain level of return over the life of those assets.

### **Return on Asset is most appropriate to Hong Kong.**

#### ***Performance based regulation (PBR): not suitable for Hong Kong***

The main advantage of PBR over traditional rate of return (ROR) regulation is that the former provides the utility with the incentive to aggressively cut expenditure because it would keep a share of the savings. However, international experience has shown that PBR has actually incentivized utilities to under-spend by cutting back necessary maintenance and upgrades. Reliability is thus compromised. Further, PBR is forward looking so if the regulator underestimates the expenditure required or simply "gets it wrong", then the utility will not "overspend" its allowance because it will not be able to recover it even if such expenditure is necessary.

Countries that use PBR are still grappling with its related host of issues, such as the distortions to investment timing. Given that PBR is usually only applied to networks, the Government should carefully consider whether its application to a vertically integrated utility would cause more problems than it solves.

The Government considers that the shorter regulatory periods for PBR, as compared to the SCA, provide more flexibility to make changes. In reality, there is less flexibility for PBR during the set regulatory period. Further, the regulatory reset every 3 to 5 years exposes the utility to a high degree of regulatory risk and leads to utilities and regulators investing substantial resources into the reset process which could be better directed.

The Government's consideration of linking tariffs to economic indicators through the CPI - X mechanism is understandable but not achievable. The CPI factor cannot be relied upon as a good indicator of the prevailing local economic situation. In addition, 90% of HEC's cost inputs are not related to the local inflation rate. This is why the fuel clause account is necessary as fuel costs are not within HEC's control. A CPI-following tariff would make tariffs unreflective of costs and increase HEC's risks. In any case, HEC's tariffs have increased at a rate well below that of inflation over the last 20+ years since 1983.

### **The Performance Based Regulation approach is not suitable for Hong Kong.**

#### ***Increased interconnection: illusory benefits***

HEC and CLP have been interconnected since 1981 for emergency backup, sharing of reserve capacity and sharing of spinning reserve. The economic benefits have been significant and fully captured.

HEC is of the view that there are several characteristics of the Hong Kong electricity market that make the benefits of increased interconnection illusory. HEC's analysis indicates that the costs of any new interconnection would be higher than the benefits of deferring new generation.

The geographic proximity and similar load profiles of HEC and CLP mean that peaks and troughs in the HEC and CLP systems generally occur at the same time. This means that any reserve sharing benefits provided by further interconnection between HEC and CLP would be minimal.

The full system efficiency benefits that might arise by allowing the power companies to purchase power from each other would be impeded by the long-term take-or-pay commitments which both HEC and CLP have in place.

Finally, utilizing interconnection for regular (rather than emergency) electricity transfers would bring with it increased risks to supply reliability. Experience from overseas, and in particular the recent blackouts in the U.S., Europe and Australia, indicate that failure of a single piece of equipment can have a cascading effect on a highly interconnected network, leading to multiple failures and even total system breakdown.

In light of these factors, HEC is of the view that the costs and risks associated with increased interconnection outweigh the minimal benefits it may offer.

**Several characteristics of the Hong Kong electricity market make benefits of increased interconnection illusory.**

***New supply sources: reliability and cost issues***

HEC agrees with the Government that the Mainland cannot be relied on in the short to medium term as an alternative source of supply for Hong Kong since the Mainland will not have surplus electricity to supply Hong Kong in the foreseeable future.

From an environmental perspective, any spare plants, if available, should be used to phase out the existing highly-polluting, low-efficiency small thermal plants in Guangdong instead of being used for exporting electricity and, indirectly, pollution to Hong Kong. From a reliability perspective, importing supply from the Mainland, whose reliability standard in both generation and transmission systems is not at par with that of Hong Kong, will jeopardize Hong Kong's electricity supply.

Thus even if the supply constraints could be resolved in the longer term, the cost of electricity from the Mainland would unlikely be lower than that from local generation if costs for longer transmission distance, reinforcing the transmission networks, and upgrading the environmental and reliability standards at par with those of Hong Kong are included.

Furthermore, the fact that operators of electricity facilities in the Mainland are not under the jurisdiction of Hong Kong's regulatory authorities would in itself create regulatory risk and uncertainty for operators in Hong Kong. This could lead to under-investment in electricity infrastructure in Hong Kong.

Based on the above considerations, HEC agrees with the Government that it would not be prudent to predicate the development of the Hong Kong electricity market on supply from the Mainland.

For new supply sources of a renewable nature, HEC agrees that their introduction to Hong Kong should be actively explored. However, practical issues such as cost-effectiveness, technical feasibility, safety and supply reliability must be carefully assessed to determine the viability of these new sources of supply.

**It would not be prudent to predicate the development of the Hong Kong electricity market on supply from the Mainland.**

***Grid access for third party users: extreme caution needed***

Any proposal in relation to open grid access needs to be considered with utmost caution in the context of its potential impact on system reliability.



At present, Hong Kong enjoys an outstanding level of system reliability. Reliability has traditionally been regarded as being of primary importance in the context of electricity networks. However, international experience has shown that mandated open access has the potential to shift the paradigm of system reliability.

The introduction of mandated open access would also require a completely new legislative framework to deal with issues such as reliability and safety standards, technical standards for connection, access pricing, liability issues, dispute resolution procedures and the establishment of an independent system operator. The costs of establishing and administering this regime are likely to be extremely high. These costs would ultimately be borne by consumers.

Open access regimes are based on the assumption that competition is a workable proposition in the relevant market. However, there are currently a number of unique local factors, including the relatively small size of the market, scarcity of land, lack of indigenous fuel supplies and alternative sources of supply, that make it impossible to introduce meaningful competition in Hong Kong in the short to medium term. In the absence of any real prospects of competition in the near future, it would be premature to introduce a mandated open access regime at this stage.

**Market size and market characteristics make mandatory open access highly risky.**

***Legislation over bilateral agreement: begs investment uncertainty and greater risks***

Regulation by bilateral agreement has a proven track record in Hong Kong. It has provided certainty to market participants, facilitated investment and resulted in a high level of supply reliability.

There is no doubt that a legislative model under which the Government can change the regulatory framework without the agreement of participants gives the Government greater flexibility. However, greater flexibility will come at the expense of investment certainty and reasonable regulatory risk.

The costs of getting the regulatory framework wrong are enormous. International experience has shown that reform involving electricity industries is complex and has many pitfalls. In particular, inappropriate regulation can lead to systematic under-investment which in turn can lead to infrastructure failure. At worst it can lead to market failure as occurred in California.

The costs of establishing and administering such a regime are also likely to be very high and will ultimately be passed on to consumers.

**Greater flexibility for changes would come at the expense of investment certainty. The costs of getting the regulatory framework wrong are enormous.**

***Independent regulation over Government regulation: no compelling reasons for change***

Government regulation has proven to be an efficient and effective means of regulating the electricity industry in Hong Kong. The current approach of sharing regulating responsibility between EDLB, ETWB and EMSD (with the advice of the Energy Advisory Committee (EnAC)) is consistent with that taken in many overseas jurisdictions where there are separate authorities dealing with economic regulation, environmental regulation and technical regulation. Normally, the independent regulators in these jurisdictions are only responsible for economic regulation.

The argument for an independent regulator to oversee the electricity sector has principally arisen in markets where change has centred on the privatisation of state-owned enterprises and where full competition has been introduced. However, arguments for an independent regulatory body lose cogency in Hong Kong where the incumbents are already privately owned and the Government does not participate in the industry.

Electricity is an essential service and the Government should not abrogate responsibility for regulating service provision lightly. In light of this, and the potential costs and regulatory uncertainty associated with introducing independent regulation in Hong Kong, HEC is of the view that there are no compelling reasons to depart from the existing form of Government regulation.

**HEC is of the view that there are no compelling reasons to depart from the existing form of Government regulation.**

## **2.12 Conclusions and recommendations**

The expiry of the current SCA gives the Government and the community an opportunity to reflect on how the Government's policy objectives have been successfully achieved in the past and how best to ensure the continued achievement of those objectives. It is important that changes are not imposed merely for the sake of change. That said, should the Government and the community decide to introduce changes, such changes must:

- firstly, be a visible improvement on the current regime and not create instability and uncertainty, taking into account the Government's key policy objectives; and
- secondly, provide benefits which unambiguously outweigh the costs and risks of implementing them.

On the first point, HEC believes that the SCA has accomplished great achievements. It has provided a framework which has delivered on the Government's key policy objectives for a number of decades at minimal cost and without Government subsidies. It has provided high reliability at reasonable cost and given a proven framework for the implementation of environmental policy. In other words, the SCA has worked extremely well.

On the second point, HEC has spent considerable time and energy in reviewing the possible changes. HEC does not believe that any of the suggested changes have benefits that demonstrably outweigh both the costs of implementing them and the risks they introduce. Fundamentally, the suggested changes involve the introduction of complexity into what has been, to date, a simple regulatory system that works. With complexity comes both additional costs and the risk of unintended consequences. Experimentation must be avoided.

At the start of this section, HEC referred to the "virtuous circle" which shows that a functioning electricity industry involves a number of mutually reinforcing elements. Even relatively minor changes can alter the dynamics of the industry and the incentives to invest. In seeking change, the community needs to ensure that the changes, if any, do not upset the balance of the existing regime, which has contributed so positively to Hong Kong. On this basis, major changes must be dismissed as unnecessary, misguided and risky.

Accordingly, HEC recommends that the Government's Stage II Consultation should proceed on the basis that the SCA would be retained in its current form. Replacing it with a new regime based on increased interconnection, open access and competition, or a regulatory model governed by legislation and an independent regulator would not represent clear improvements. Indeed, they would raise real issues and risks that contain far-reaching ramifications.

HEC believes the Stage II Consultation should concentrate on:

- agreeing on the elements of the current SCA for the next term given that the existing balance in the SCA is appropriate; and
- refining the SCA by making appropriate adjustments within the current framework that clearly enhance the regime and further deliver on the Government's objectives.

HEC looks forward to working with the Government and other stakeholders in Stage II Consultation.

**Experimentation must be avoided. Should changes be introduced, they must offer visible improvements and not create instability and uncertainty. The benefits must outweigh the costs and risks. HEC does not believe the suggested change options offer real and meaningful benefits. HEC recommends that the Government's Stage II Consultation process should proceed on the basis that the SCA would be retained in its current form.**