



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



EXECUTIVE SUMMARY

Submission on Stage II 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 II Consultation Paper on the Future Development of the Electricity Market in Hong Kong.

For convenience, this submission comprises four broad parts:

Section	Topic
Section 2	Executive summary
Section 3	Outline of HEC's views on balancing priorities
Section 4	Policy objectives
Sections 5 to 17	HEC's submission on individual items raised in the Stage II Consultation Paper

As discussed further in section 2 below, HEC makes this submission in good faith as a contribution to the valid public debate about the future of Hong Kong's electricity market. However, HEC participates in the consultation processes and makes this submission without prejudice to its rights in connection with the Scheme of Control Agreement (SCA) and the extension of the SCA.

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For details of the Full Submission, please visit Hongkong Electric's web site at <http://www.heh.com>.

2 Executive Summary

2.1 Summary

Hong Kong has enjoyed reliable electricity supply for so long, it is easy to take for granted. This is not luck. It is because the SCA has provided a fair, balanced and simple regulatory environment. As a result, HEC has invested tens of billions of dollars of its shareholders' funds in building and maintaining the electricity system in Hong Kong. Unlike in many other countries, the Government does not subsidise the electricity sector.

However, for HEC to continue investing, it must have investment certainty - it must be able to earn a reasonable return and recover its investment in the future. Yet the Government proposes to radically overhaul the SCA regime that has served Hong Kong so well. These proposals introduce an unacceptable level of regulatory risk.

The Government's proposals raise a complex set of inter-related issues. As will be evident from the balance of this submission, HEC has carefully considered each issue, both in isolation and in the context of their overall impact. Where HEC disagrees with a proposal, it has provided detailed analysis and reasoning.

The shortcoming seen in the Government's proposals can be distilled into three fundamental issues:

- First, the proposed reductions in the term and current rate of return (ROR) introduce an unacceptable level of regulatory risk and are likely to disincentivise investment.
- Second, many of the proposals (most notably the environmental changes) are under-developed, lack of coherence and are likely to work against the Government's stated objectives.
- Third, the proposals envisage a total overhaul of existing market structures (for example, interconnection and grid access) without providing any detail or considering the many adverse impacts that would result. No cost/ benefit analysis of the proposals has been provided.

The Government's proposals fail to balance interests of various stakeholders. They will not deliver the policy objectives but will undermine the excellent reliability of Hong Kong's electricity system.

Altogether, the proposed package threatens to unhinge a system of balance and reciprocity that has served Hong Kong well for decades. HEC calls on the Government to recognise the need to retain the SCA regime in substantially its current form.

The Government’s proposals introduce an unacceptable level of regulatory risk that will undermine investment and as a result, system reliability.

2.2 Good regulation is about achieving the right balance

The essence of regulatory principles is about striking the right balance.

This is particularly so for utilities regulation. A power company’s obligation to continuously invest in long life assets must be matched by a regulatory commitment in relation to those investments.

The fact that the current SCA has delivered the twin achievements of high reliability at reasonable tariffs shows that it strikes the necessary balance.

The Government is mistaken if it believes that its proposals are simply “tinkering” with or a refinement of the SCA. In fact, the proposals involve a radical reallocation of risk which fundamentally undermines the regulatory deal represented by the existing and previous SCAs. Every change proposed to the SCA either imposes a new obligation on HEC or removes regulatory certainty.

The proposals do not achieve the right balance and, if implemented, will lead to an ineffective and inefficient regulatory regime.

2.3 Policy objectives

Enhancing the objectives and resolving tensions

The policy objectives are the foundations of a regulatory regime. HEC agrees with the Government’s stated objectives of reliable, safe and efficient supply at reasonable prices with minimal environmental impact.

However, these policy objectives can be enhanced in two ways.

“Clear specification of objectives is fundamental to all regulation.”

Australian Productivity Commission¹

“The inclusion of multiple objectives, however, increases the risks of conflicts and inconsistent application”.

OECD²

¹ Productivity Commission, *Review of the National Access Regime*, Report no. 17, AusInfo, Canberra (2001) p 124.

² OECD, *The Objectives of Competition Law and Policy*, OECD Journal of Competition Law and Policy, vol 5, no. 1 (2003) pp 8-29.

First, there are necessarily trade-offs among them and no guidance is given as to how this will occur. Without this clarity, a regulatory regime can rapidly become piecemeal and counterproductive as the impact of mechanisms designed to achieve one objective ends up undermining the achievement of others.

To balance conflicting policy objectives, the Government must indicate which objectives are to take precedence when regulatory decisions involve trade-offs between objectives.

Second, other countries have recognised the danger of pursuing short-term price reductions as a policy objective at the expense of the other objectives, which must be measured over a longer time. For example, in relation to the recent reforms of the Australian electricity industry:

“The [Ministerial Council on Energy] notes, however, that its chosen objects clause refers decision makers specifically towards the long-term implications of decisions, and also emphasises the importance of non-price outcomes - such as reliability and security (in turn, a function of investment)...”³

The Government’s objectives should explicitly recognise the long-term nature of the decisions made by investors and the need to provide sufficient incentives to invest in the electricity infrastructure.

Reliability and safety are the primary objectives

The most important finding of the Stage I consultation was that the public believed that reliability and safety are the primary objectives.

These findings were reinforced by a recent HEC opinion survey (included in Appendix 5 of the full report) which revealed that 78.3% of respondents preferred to have an electricity market with *certainty of reliable supply and affordable tariffs*, while 20.1% preferred a market with *uncertainty of reliable supply but a slightly lower tariff* (Figure 1).

³ Ministerial Council on Energy, *Review of the National Gas Pipelines Access Regime - proposal for consultation*, November 2005, p 8.

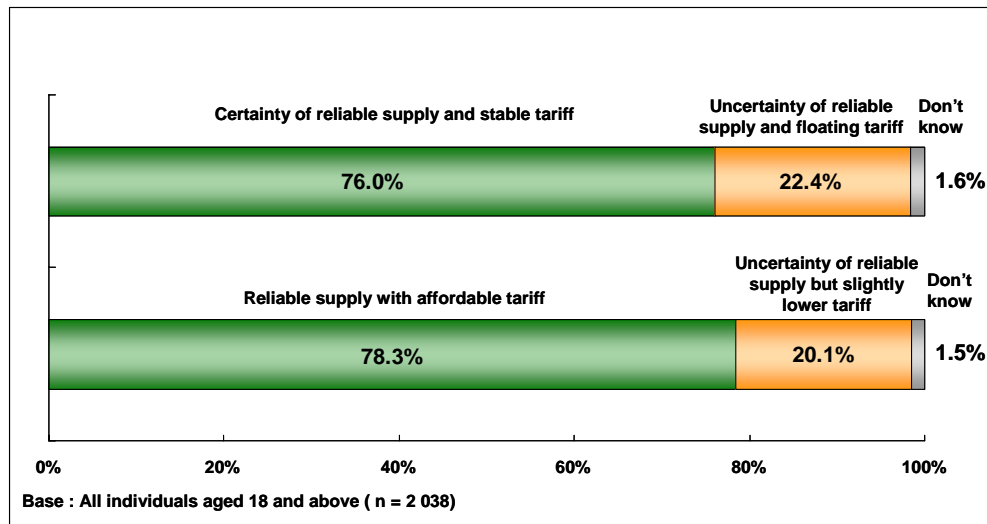


Figure 1: Opinion Survey on future development of the electricity market in Hong Kong (March 2006) – Trade-off between reliable electricity supply and tariff

In addition, through discussion with its small and large customers in the past few months, HEC clearly understands that electricity supply reliability is the main customer concern. This is particularly the case for the commercial sector, which consumes more than 73% of HEC's sales, as they rely on adequate and reliable electricity supply to ensure smooth running of their businesses. According to InvestHK, the investment promotion agency of the Government, the electricity supply in Hong Kong represents "very good value for money"⁴ and that "blackouts are not part of the vocabulary"⁵.

This is not surprising. Hong Kong is particularly reliant on electricity for elevators and air conditioning given its high density and climate, not to mention its IT, logistics, financial services and manufacturing industries.

In fact, as shown by the latest Emporis Skyline rankings (Figure 2), Hong Kong has the highest population of high-rise buildings in the world. More than 50% of its residents live or work above the 15th floor.

⁴ InvestHK web site <http://www.investhk.gov.hk/content1q.aspx?id=805&code=SETUP-PREM-UTIL&lang=1>

⁵ InvestHK web site <http://www.investhk.gov.hk/content1q.aspx?id=747&code=IHK2-KEYADV-INFRA&lang=1>

Rank	City	Population	Buildings ¹	Points ²
1	Hong Kong	6,787,000	7,527	118,593
2	New York City	8,168,338	5,478	35,736
3	Seoul	10,331,244	2,839	15,850
5	Singapore	3,437,300	3,559	13,629
8	Tokyo	8,130,408	2,289	9,679
17	Sydney	4,201,500	827	4,186
27	London	7,172,036	1,304	2,746
46	Paris	2,152,467	250	1,783
56	Taipei	2,719,293	167	1,426
59	Frankfurt	652,412	276	1,315

Notes:

- 1 A high-rise building is defined as a building 35 meters or greater in height, which is divided at regular intervals into occupiable levels.
- 2 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

Source: Emporis (www.emporis.com)

Figure 2: Emporis Skyline Ranking 2006

Hong Kong currently enjoys 99.999% reliability. New York (Manhattan), Tokyo, Singapore, London and Sydney have set or achieved similar levels of reliability.

The basis for doing so is understandable in economic terms. In its Stage I submission, HEC calculated that lowering reliability by 1% (i.e. to 99%) would conservatively cost Hong Kong US\$15 billion per year.

The Government must expressly acknowledge that reliability and safety are the primary objectives for the Hong Kong electricity market and endorse the current reliability level of 99.999% as necessary for a leading commercial and financial hub such as Hong Kong.

Reliability is not free

“Regulators and consumers should recognise that reliability is not free, and that maintaining it requires ongoing investments and operational expenditures by many parties. Regulated companies will not make such outlays without assurances from regulators that the costs will be recoverable through approved electric rates, and unregulated companies will not make such outlays unless they believe their actions will be profitable.”

US-Canada Power System Outage Task Force, April 2004

“Balancing stakeholder interest is the key to regulatory success. Because international investors develop scorecards for regulators by evaluating their performance, excessive weight given to short-term political objectives is likely to lead to higher costs of capital and reduced capacity investment.”

Lessons from the 13th PURC/World Bank International Training Program on Utility Regulation and Strategy, January 13.24, 2003

The above quotes highlight some important issues for this consultation:

- Reliability is not free - it requires ongoing investment.
- Investment will only occur if there is regulatory certainty and the risks are matched by the returns.

The SCAs have to date struck a fair balance. They provided certainty that HEC could earn returns on investment within defined parameters. In return, customers have had excellent supply reliability and reasonable tariffs.

The current proposals remove much of this certainty and introduce an unacceptable level of regulatory risk. Despite this, the Government has proposed drastic reductions to the current permitted ROR earned by HEC on its investments in electricity infrastructure.

If the Government introduces an unbalanced regime, there will not be incentive to invest in the long life electricity assets and supply reliability could be jeopardized.

The objective of reasonable tariffs

One of the objectives is to ensure that electricity is supplied at reasonable prices. Therefore, an implicit assumption in the Government’s intention to reduce tariffs is that the existing tariffs are unreasonable.

This is simply not the case. The SCAs have already provided reasonable prices in accordance with the Government’s objectives.

- 69% of respondents to the Stage I Consultation were of the view that the current tariffs are reasonable, comparable with those in overseas markets and only accounted for a small percentage of their income or expenditure.
- Hong Kong’s tariffs are in the middle of the range when compared to other cities. In fact, they are low by world standards once the lower levels of reliability and state subsidisation of electricity tariffs in other cities are taken into account (Figures 3 & 4).

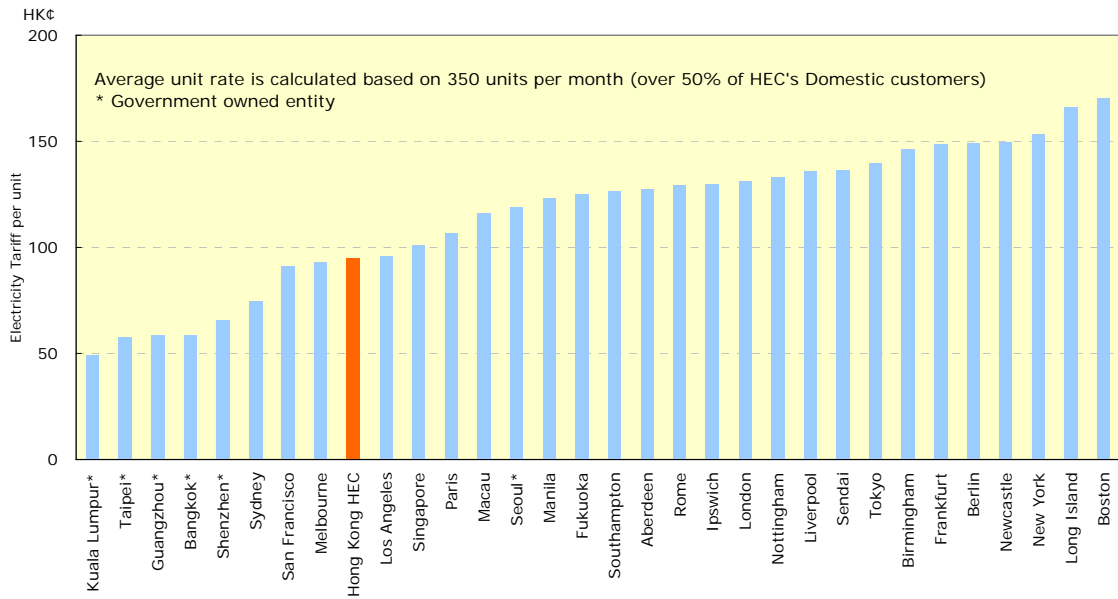


Figure 3: Comparison of residential tariff (monthly consumption at 350 units)

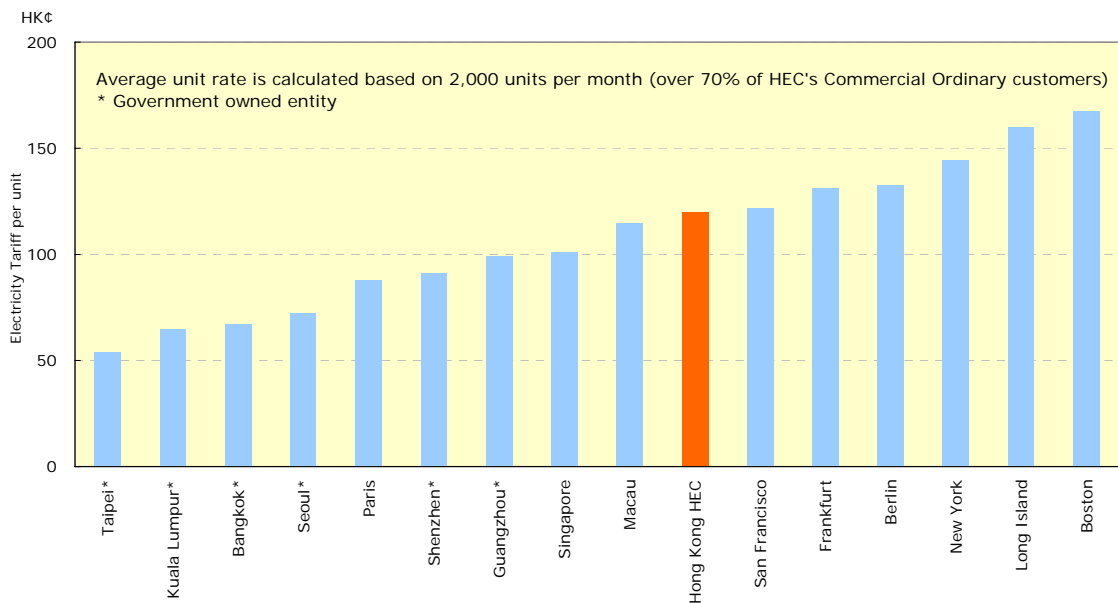


Figure 4: Comparison of commercial tariff (monthly consumption at 2,000 units)

- Expenditure on electricity constitutes only 1.7% of household expenditure for Hong Kong families. It is a small percentage relative to those on other commodities (Figure 5).

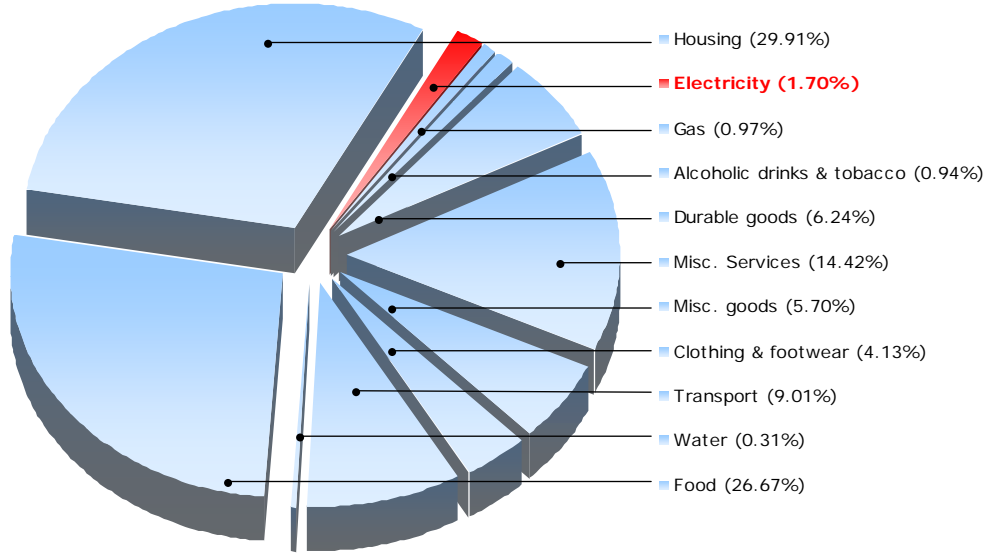


Figure 5: Average monthly household expenditure by commodity/service

- Tariff is more affordable in Hong Kong than elsewhere in Asia when comparing the share of electricity expenditure in CPI (Figure 6).

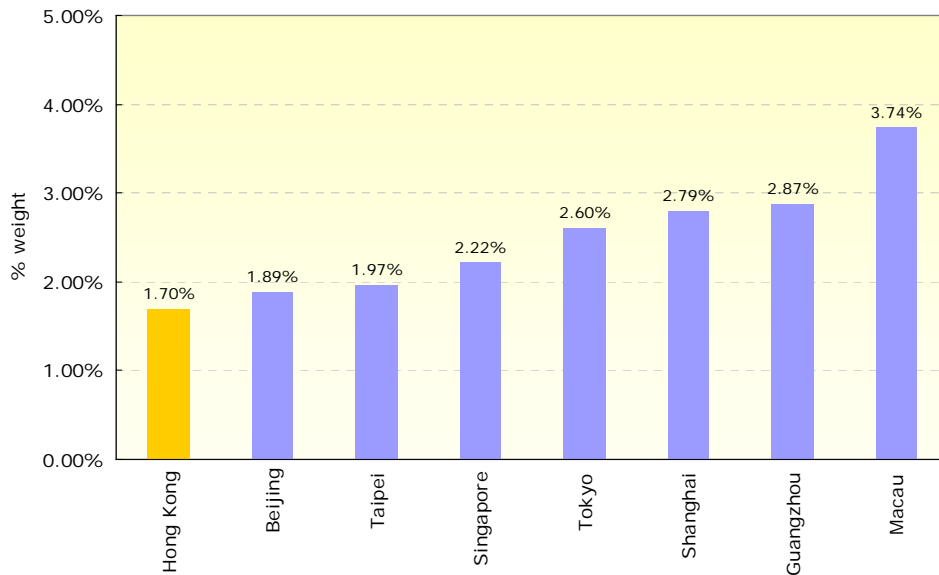


Figure 6: Comparison on weight of electricity in CPI

The objectives will not be met

“The success of regulatory systems can be measured as their ability to accomplish their policy objectives.”

Erkki Liikanen, Member of European Commission⁶

The Government must recognise that in implementing a drastic reduction in RORs and increasing investment risk, it is likely that reliability will be compromised in the medium to long term.

While consumers will always want lower prices, the Stage I Consultation has shown clearly this should not be at the expense of reliability.

As HEC’s tariffs are competitive and affordable, it is not appropriate to propose tariff reduction without considering the impact on reliability.

2.4 Regulatory instrument

The existing SCA is clearly a simple, low cost approach which has served Hong Kong well. HEC supports the Government’s proposal to enter into a new bilateral agreement.

However, HEC disagrees that:

- the term of the SCA should be shortened to 10 years;
- a joint 5-yearly interim review under which the permitted ROR would be adjusted is necessary.

10-year term with a 5-year extension option

The Government is effectively shortening the SCA term as HEC cannot assume the option will be exercised. HEC does not support this proposal for four reasons.

First, in principle, the term should match the life of the assets which is over 30 years. Already, the current SCA is a compromise on this issue which was acceptable when it was understood that the SCAs would be rolled over as it was in 1993. Further shortening the term by a third significantly increases the level of investment risk. Take an example of a hypothetical investment with a 30-year investment horizon, which is typical for the electricity supply industry. It can be seen from Figure 7 below that, with a regulated ROR of 9.5% (lying between the 7 – 11% range as proposed by the Government), the investment only starts to generate positive effective return from year 9.

⁶ E Liikanen, ‘Better Regulation from Principles to Practice’, (Paper presented at Alternative Regulatory Models Conference, Brussels, 6 February 2001).

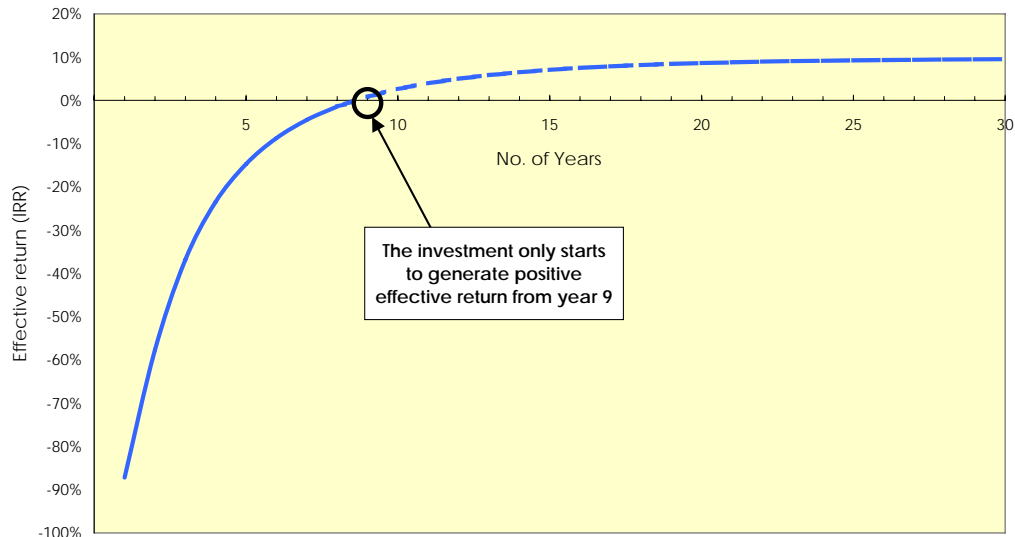


Figure 7: Effective return of a 30-year life asset under a 9.5% regulated ROR

The change from 15 to 10 years is significant. As shown in Table 1 below, the “break-even” point is near the end of the contract and not in the middle. The difference in the effective return between a 10-year regime and a 15-year regime is more than 4%.

Second, it is unclear why the Government is proposing both a shorter term and 5-yearly reviews. This interim review could mean the SCA, to some extent, operates as a 3 x 5 year agreement. While HEC believes neither a 5-yearly review nor a shorter term is necessary, there can certainly be no justification for both.

Third, shortening the term also increases regulatory costs. As demonstrated by this consultation process, recontracting or introducing changes incurs significant expense and management time.

Finally, HEC understands that the shorter term is partly driven by a belief that within 10 years the Mainland supply situation will have improved sufficiently to allow competition. HEC doubts this, but so too must the Government if it is seeking a 5-year extension option.

Regulatory period (years)	Effective return
1	-87.2%
2	-57.6%
3	-36.8%
4	-23.5%
5	-14.7%
6	-8.7%
7	-4.5%
8	-1.4%
9	0.8%
10	2.6%
11	3.9%
12	5.0%
13	5.8%
14	6.5%
15	7.0%

Table 1: Effective return of a 30-year life asset under a 9.5% regulated ROR

5-yearly interim review of the ROR

This is inconsistent with the underlying philosophy of the SCA, namely a fixed long-term contract which provides investment certainty. It creates a de facto regulatory period of 5 years, not 10 or 15 years.

A 5-yearly reset process will also be expensive and time consuming.

Shortening the term by a third increases the level of investment risk unacceptably, lowering the effective ROR by more than 4% and pushing the break-even point towards the end of the period.

2.5 Determining the permitted return

Average Net Fixed Assets (ANFA)

HEC agrees with the proposal to continue using ANFA for the purpose of determining the rate base. This return on asset (ROA) approach is a common practice worldwide and is simple to monitor. It maintains the status quo, meaning that neither customers nor HEC will be impacted by moving to a new approach. In addition, it is conducive to more efficient financing.

Changing the Excess Capacity Mechanism

The existing mechanism is already a generous one for consumers. HEC believes the 50/50 sharing of the “prediction risk” should continue. HEC should not be required to bear this level of risk given it has invested in good faith, with Government’s approval and on the best available information.

HEC believes the Excess Capacity Mechanism should not be tightened to a 100% penalty. The mechanism is a severe ex post penalty that can be imposed by the Government after the completion of a plant, even if it is built with the Government’s prior approval.

Under the SCA, HEC has an obligation to predict load growth and invest in advance to ensure it is capable of meeting it. However, under this mechanism, HEC will be penalised for not having perfect foresight even though the Government agreed with HEC’s planning. This sort of penalty is very rare in other jurisdictions and contrary to best regulatory practice which does not set prudence tests on the basis of “20/20” hindsight.

The main point of the mechanism is to incentivise the power companies to use the best forecasting available and not undertake any unnecessary investment in the first place. It has been effective in its current form as HEC has twice deferred generation investment.

To ask HEC to bear all the risk is patently unfair.

Changing the Excess Capacity Mechanism to 100% penalty is unnecessary given the effectiveness of the existing arrangement. It is also unfair requiring HEC 100% foresight to meet adequately electricity demand while disallowing any excess capacity.

Integrated approach to determine the permitted ROR

HEC is entitled to a fair and reasonable return. Setting the permitted ROR is not an exact science. There is no perfect number or perfect approach. Rather, there is a “zone of reasonableness”.

HEC supports an “integrated approach” which recognises that setting the permitted ROR is not a mechanical exercise and requires explicit consideration of the issues facing the Hong Kong electricity sector. The purpose of the integrated approach should be to identify this “zone of reasonableness” by integrating a range of approaches. This reduces the error and imperfections inherent in relying on any one approach.

HEC has considered a number of approaches for determining the ROR which can be broadly categorised as follows.

- **Benchmarking** - Benchmarking against the ROR for the Hong Kong bus companies, US utilities and the Hang Seng Index stocks. HEC disagrees with the Government’s rejection of benchmarking. It is consistent with the underlying basis of ROR regulation and a valuable “sanity check” to what is a difficult and subjective process.
- **Margin over Weighted Average Cost of Capital (WACC)** - This approach is designed to capture the true cost of capital by taking into account all investment risks, including those unique to Hong Kong and specific to the power industry. WACC can be Nominal WACC or Real WACC depending on whether or not inflation has been included.

HEC has considered international experience on the required margin which provides a qualitative assessment.

In addition, HEC has developed Monte Carlo modelling which objectively analyses the nominal ROR required so that HEC is likely to earn the required real WACC once various risks are taken into account. This provides an objective basis for determining the necessary margin.

Four approaches are used below to determine the “zone of reasonableness”.

1. Benchmarking with Hong Kong bus industry (For details, refer to Chapter 6 of Full Report)

The WACC calculated by Environment, Transport and Works Bureau (ETWB) for the bus industry is 9.7% under the prevailing economic conditions. As the electricity industry faces much greater risk and as explained in detail in the submission, it requires an additional margin of at least 3% to 4%.

An application of the benchmarking with WACC calculated by ETWB for the bus industry would imply a return of 12.7% to 13.7%.

II. Benchmarking with US utilities (For details, refer to Chapter 6 of Full Report)

As discussed above, HEC believes there is value in benchmarking against other jurisdictions, provided differences in the regulatory and investment environment are taken into account.

The US has been chosen as a benchmark because it is home to many privately-owned electric utilities that have been subject to ROR regulation for long periods of time. The US also has highly liquid financial markets which provide investors with a large choice of investment opportunities.

There are obviously differences between the US regulatory regime and the SCA. However, with minor translations, it is possible to identify a useful benchmark reference. HEC has analysed the return on equity and return on debt for the US utilities, and quantified the differences in risk between Hong Kong and US.

An application of the benchmarking with the US utilities yields an ROR of 13% - 15.6%, as calculated by an after-tax WACC formula.

III. Benchmarking with Hang Seng Index stocks (For details, refer to Chapter 6 of Full Report)

HEC has analysed the returns available from the Hang Seng Index stocks over a 26-year time frame from 1979. The average annual return from Hang Seng Index stocks is around 23% and can be taken as return on equity. With a best lending rate average of about 9.24% in the same period, the ROR would be 17.68%.

While it is true that HEC's risk profile may differ from that of other Hong Kong companies listed on the exchange, this is reflected in HEC's lower permitted ROR.

An application of the benchmarking with the return of the Hang Seng Index stocks would imply that the current permitted ROR is reasonable.

IV. Margin over WACC - qualitative approach based on international experience (For details, refer to Chapter 6 of Full Report)

The Government's integrated approach for the determination of the permitted ROR can be construed as a "margin over WACC" approach, i.e. the cost of capital is determined with regard to traditional components and a further margin is added to take into account specific HEC and Hong Kong issues and other costs.

HEC does not object to this approach. Regulators all over the world have recognised that WACC should be the minimum ROR for investment rather than a cap. While some of the risk factors may be internalised in calculating WACC according to the traditional methods, it is well understood that these methods do not fully take into account the true costs facing a particular company or industry when making investment decisions.

As set out below, there is support from international experience that a generic margin of at least a 1 to 3% increment is appropriate.

- According to the benchmarks set by Evaluation Cooperation Group of the Multilateral Development Banks which includes the World Bank and other Regional Development Banks, the financial ROR should exceed WACC by 2.5% or more for business to be rated as “excellent”.
- Specifically for the power industry in jurisdictions such as New Zealand, which adopt WACC as the basis for return determination, there were numerous discussions on the need for a margin of 2-3% over WACC.
- The “margin over WACC” approach is commonly adopted in regulating ROR or assessing project return for local transportation operators. For example, the Government expressly stated in the IPO prospectus of MTRC that the suitable commercial margin over MTRC’s WACC is between 1% and 3% for railway projects.

At the same time, the ROR must reflect the specific risks faced by HEC under the regulatory regime. For example, the tariff-setting rules contain a number of constraints that mean HEC is, on average, likely to recover less revenue than the target revenue.

HEC has developed an approach using Monte Carlo modelling which explicitly recognises the unique features of the regulatory regime as proposed by the Government in the Consultation Paper. It objectively quantifies the impact of these challenges and risks on the permitted return.

The combination of this objective quantitative approach with the benchmarking and qualitative approaches discussed above provides a robust approach to determining the permitted ROR.

Monte Carlo simulation is a widely accepted technique in the economics and finance fields. An application of the simulation determines that the minimum nominal ROR of 12% - 14% is required to give the power companies a 60% probability of achieving a real WACC of 6.5 - 8.5%.

Through the application of the four approaches it is clear that the 7-11% range of permitted ROR in the Stage II Consultation Paper is far too low. In fact, it is too early to determine the ROR at this stage as other price and non-price issues have not yet been resolved.

2.6 Different ROR for each asset class

The proposal for a different ROR for each asset class is an inappropriate policy option.

It is a penalty

The low ROR for emission reduction facilities constitutes a penalty. This is contrary to the fundamental tenet of ROR regulation which is to give the electric utility an opportunity to earn a fair and reasonable ROR. It is also unprecedented - HEC is not aware of a penalty being applied in this manner in any other jurisdiction.

It is unlikely to encourage renewable energy (RE) investments in its current form

The higher ROR is a weak incentive to encourage further RE investments. Implicit in this proposal is that such investments are not ordinarily economic. There is no guarantee such investments will continue to earn this higher ROR (or any regulated ROR) after the SCA expires.

Fails to meet policy objectives - investment distortion

It encourages:

- investment in RE rather than emission reduction facilities, even though this is not the least cost solution to meeting the emission caps; and
- investment in small scale and distributed generation solutions rather than more efficient and environmentally friendly large-scale generation investment.

Inefficient investment brought about by this proposal must inevitably lead to higher tariffs than are necessary.

Complexity and cost increase

It introduces complexity and increases administration costs. It will require more auditing and resources from the Government. It also makes the regime and an investment in HEC more difficult to understand and less attractive to investors.

“This approach is not without its problems, amongst which, difficulty in asset classification and the potential increase in administrative costs should not be underestimated.”

EDLB, Stage II Consultation Paper

Tiering RORs according to different asset types is an unprecedented policy that would increase complexity and distort investment.

2.7 Transition costs

A regulatory change should only proceed if the benefits clearly outweigh the costs. One major cost that the Government has failed to take into account in the Consultation Paper is the transition and stranding costs arising from its proposals.

Payments for stranded costs have occurred in every electricity market in the world that has undergone major electricity reform of the kind contemplated here.

The Government needs to consider that its proposals:

- are inconsistent with its regulatory compact with HEC; and
- involve the introduction of competition.

The management and mitigation of these costs is a major issue that needs to be dealt with now if the proposals and further development of the electricity market are to be implemented.

There is a regulatory compact

The existence and nature of a regulatory compact have been the subject of controversy in the US but in Hong Kong the situation is simpler - an explicit contract, namely the SCA, exists. While the overall compact is broader than the SCA, the SCA's recitals specifically set out the underlying basis of the relationship:

“HEC recognises its continuing obligation to contribute to the development of Hong Kong by providing sufficient facilities to meet the present and future demand for electricity and in pursuit of this objective, would construct additional generation, transmission and distribution facilities for sale of electricity to its consumers.

The Government recognises that HEC and its shareholders are entitled to earn a return which is reasonable in relation to the risks involved and the capital invested in and retained in the businesses”

In short, HEC agrees to continue to invest on the assurance that the Government will allow HEC to earn a reasonable return. The Government cannot unilaterally change the regulatory compact.

The critical feature of the compact is the understanding that the SCA would be renewed in substantially its current form. Any material departure must be fully justified and accepted by all.

Where is the evidence?

People may argue about the evidence but it can be addressed through examining the parties' expectations, the terms of the SCA and representations by the Government. However, it can also be answered much more directly by asking one simple question:

Would any rational investor:

- 1 commit tens of billions of dollars to installing assets of 30-35 years service life which may be stranded upon expiry of a 15-year term contract; and
- 2 when such investment could not be recouped during that term?

The answer must be no, unless that investor and the Government expected the contract to be renewed on substantially the same terms as it was in 1993.

Changing any regulatory regime inevitably incurs transition and stranding costs. These issues arising from the Government's proposals have not been addressed.

2.8 Performance incentives

Proposals lack detail

The Government's proposals regarding performance incentives to improve energy conservation, demand side management, use of RE, operational efficiency and service quality are under-developed, making it difficult to comment. HEC has a number of reservations.

Service quality – price trade-off

At a practical level, the two power companies already have very high performance standards in these areas. It is therefore unclear whether there is room for significant improvement.

The Government and indeed consumers must accept that the current high standards are a function of a regime in which the power companies are able to earn reasonable returns. If tariffs are to fall significantly, then the Government and consumers cannot expect service standards to remain the same.

To further penalise HEC under an inappropriately set performance mechanism is to exacerbate the problem by further depriving HEC of the funds necessary to deliver high quality services.

Implementation

Any performance incentive scheme must be carefully designed. HEC has set out some high level key principles in its submission which must be met. The Government must also take into account that any such scheme is likely to have implementation and administration costs.

The current high standards achieved by HEC are a function of a regime in which the power companies are able to earn reasonable returns.

2.9 Tariff regulation

HEC agrees in principle with most of the Government's proposals regarding tariffs:

- The costs for making available supply (operating costs and fuel charges) and the agreed return to the company for providing the service must be included in determining the tariff.

This is a fundamental aspect of ROR regulation. The tariffs are HEC's main source of revenue and they must obviously be set at a level which allows it to meet its costs of service, including a return on its assets.

- HEC also agrees that the tariffs should be subject to annual reviews to ensure that they continue to reflect actual costs of service.
- HEC is willing to consider any reasonable request for the power companies to make available more information to the public provided that commercially sensitive information is protected.
- HEC agrees that the Fuel Clause Account should be maintained. As Hong Kong has no indigenous fuel resources and the power companies must import fuel, they are exposed to price volatility.

Government review of tariff changes

HEC's projected tariffs are already subject to Government approval together with a 5-Year Financial Plan. It is unnecessary for the Government to approve the annual tariff review.

The proposal introduces an inappropriate level of discretion on the Government with no safeguards. As noted by the Victorian electricity regulator, the Essential Services Commission:

“excessive discretion or the inappropriate exercise of discretion can increase uncertainty and regulatory risk which can in turn increase the cost of capital, or prevent companies from undertaking investments or initiatives that would otherwise improve efficiency.”⁷

The Government will be under political pressure whenever a tariff increase is required. This undermines the entire regulatory regime which is designed to give HEC certainty that it will be able to recover its costs of service and a reasonable return. The existing regime for tariff adjustments should be maintained.

Government approval of annual tariff review will turn it into a political decision and undermine the entire regulatory regime.

Tariff Stabilisation Fund

The Fund is an important mechanism for stabilising tariffs and the Government is correct in retaining it. However, the proposal to lower the cap which applies to the Fund is unnecessary.

Concern about excessive accumulations in the Fund is unwarranted. The existing cap was only agreed in 2003. In any case, HEC has not built up large balances in its Development Fund for many years.

Consistent with regulation in other jurisdictions, the Tariff Stabilisation Fund should operate symmetrically, i.e. it should be able to go into debit. This will remove any incentive to accumulate positive balances in the Fund.

Rather than lowering the cap on the Tariff Stabilisation Fund, the Government should allow the Fund to go into negative balance, thus removing the incentive to accumulate.

2.10 Institutional set up

Existing institutional arrangements are appropriate

HEC agrees that the current institutional arrangements, under which regulatory responsibility is shared among Economic Development and Labour Bureau (EDLB), Electrical and Mechanical Services Department (EMSD) and

⁷ Productivity Commission, *Review of the Gas Access Regime*, Report no. 31 (2004) p 110.

Environmental Protection Department (EPD), are an appropriate division of responsibility within Government.

As highlighted in the Consultation Paper, the current institutional arrangements have provided an effective means of “*regulating the electricity industry and ensuring a proper balance of economic, safety, reliability and environmental issues pertaining to electricity supply issues.*”⁸

Maintaining the current institutional arrangements is also consistent with the Government’s proposal to continue economic regulation by means of a bilateral agreement. The Government, as counterparty to the bilateral agreement, is in the best position to implement the economic regulatory arrangements.

Future arrangements

However, HEC is concerned about the Government’s proposal to move towards an independent economic regulatory body in the future. This creates an unacceptable level of uncertainty as to whether the SCA will form the major boundaries of HEC’s regulatory obligations for the next regulatory period.

HEC considers that any moves towards establishing a separate independent economic regulator are premature in the context of the next regulatory period, particularly in light of the fact that:

- the chances of new sources of supply during the next regulatory period remain remote; and
- major hurdles to increased interconnection and grid access remain unresolved and are unlikely to be resolved in the next regulatory period.

Costs of independent regulation

The costs of establishing and maintaining an independent regulatory body can be extremely high. Ultimately, these costs will be borne by consumers.

There is also a significant risk that these costs increase over time. The International Energy Agency has noted that:

*“The move towards political independence has implications for the management of the public sector because it usually entails setting up a separate organisation. This is costly, and more importantly, establishing autonomous organisations may produce some problems in the long-term because of the tendency of organisations to grow and self perpetuate.”*⁹

⁸ Stage II Consultation Paper, para 2.71.

⁹ International Energy Agency, *Regulatory Institutions in Liberalised Markets* (2004) p 14.

The existing regulatory arrangements have worked well and efficiently. Moves towards an independent regulatory body are premature and likely to lead to higher costs and overregulation.

2.11 Safety regulation

At present, safety of electricity supply is regulated under the Electricity Ordinance (Chapter 406), with EMSD as the enforcement agency.

HEC agrees that the existing arrangements should be retained in relation to the safety of electricity supply. The existing arrangements have proven to be an effective means of ensuring the high safety standards which are crucial to ensuring supply safety.

2.12 Environmental regulation

HEC supports the Government's policy objective of minimising the environmental impact caused by the production and use of energy. However, although the Stage II Consultation Paper provides a starting point in this regard, HEC has identified a number of significant concerns with the Government's proposals.

Failure to meet policy objectives

The proposals undermine, rather than advance the Government's policy objectives.

- **Failure to achieve emissions reduction**

The Government's proposals give too much weight to RE as a means of reducing emissions. Regardless of any financial incentive offered to power companies, there are a number of impediments to the further adoption of RE in Hong Kong, including physical constraints domestically, issues associated with the importation of RE from the Mainland, and the high cost of RE compared with other energy sources.

- **Increased reliability risk**

If caps are set solely by reference to the intergovernmental regional emission targets, they are likely to be stringent to the point of being unachievable. When these caps are considered in light of the proposed penalties for non-compliance, the power companies will face a dilemma whether to resort to reducing coal-fired generation to achieve compliance. This may create an unacceptable risk to supply reliability.

- **Not cost-effective**

The proposals distort investment towards less cost-effective strategies for reducing emissions, contrary to the Government's objective of efficient energy supplies at reasonable prices.

The over-reliance on RE to improve air quality is inappropriate given Hong Kong's geography and the technology's high cost, while applying a lower ROR to emission reduction facilities will discourage investment in this area.

Contrary to best practice environmental regulation

A number of aspects of the proposals fall short of best practice environmental regulation.

- **Governments should set outcomes, not mandate means**

The proposals manifest a "command and control" approach to regulation. Regulation which dictates what type of environmental expenditure should and should not be undertaken to achieve the Government's objectives shifts the onus of finding cost-effective emission reductions from those best-positioned to locate them (the power companies) onto the Government, which is not in the best position to identify emitters' needs and opportunities.

- **Polluter pays does not mean that users do not**

The Government's proposal to apply a lower ROR to emission reduction facilities is simply not supported by the "polluter pays" principle, as has been suggested by the Government. HEC considers that it should be entitled to pass through to consumers the full costs (including a fair return on and of capital) of any environmental expenditure which is necessary and prudent, whether that expenditure is on RE, emission reduction facilities or new gas-fired plant.

- **Penalties are unfair, heavy handed and arbitrary**

There is a high level of duplication in the proposed penalties for non-compliance with emission caps.

- **Emission caps are unachievable and have been set without reference to recognised emissions allocation methodologies**

HEC is concerned that the Government may, contrary to international best practice for the setting of emission permits/caps, seek to employ the following:

- (i) the initial emission caps would be set unilaterally by the Environmental Protection Department, without proper consultation with affected stakeholders;
- (ii) caps calculated solely by reference to the intergovernmental regional emission targets taking no account of power companies' historic emission levels, unlike the "grandfathering" approach adopted in the EU and the UK; and
- (iii) the proposals would provide no certainty as to the projected level of emission caps in the medium to longer term, making it difficult for HEC to formulate a long-term emissions reduction strategy.

Moreover, HEC considers that emission caps stipulated by the Government do not account for the likely magnitude and speed of reduction that can be realistically expected of power companies. The difficulty of achieving the proposed caps is compounded by the already-high levels of emissions performance being achieved from existing plants, and the Government's refusal to consider the second gas combined-cycle unit L10 suggested by HEC in its discussion of the 2004-2008 Financial Plan. In the absence of significant new investment in gas-fired generation, HEC will not be able to meet these excessively stringent caps through RE and emission reduction facilities alone.

- **Uncertainty**

The proposals do not provide sufficient certainty to market participants.

- (i) There is insufficient detail about the Government's long-term RE policy specifically and the future electricity regulatory regime generally for investors to confidently invest in RE, a risk which is compounded by the proposal for a 10-year SCA term. The premium ROR applying to RE does not mitigate this regulatory risk.
- (ii) The Stage II Consultation Paper is silent on the treatment of gas-fired generation assets post-2008, notwithstanding the critical role gas-fired generation is expected to play in reducing future emissions from the Hong Kong power sector.

- (iii) The Consultation Paper contains no guidance as to emission targets beyond 2010 or how exactly the Government proposes to “*progressively tighten the emission caps on major pollutants when renewing the licences of individual power plants.*”¹⁰ Without a clear picture of the post-2008 regulatory framework, power companies cannot begin developing and implementing their long-term investment planning.

Power companies are best qualified to decide how to meet emission targets, and should be able to pass through the costs to the end-users.

The penalties and emission caps are overly stringent and set without reference to local operating conditions.

2.13 Supply from the Mainland

HEC agrees with the Government’s comments that:

- there are serious issues to be considered with regard to importing electricity from Guangdong and it would be prudent at this stage not to predicate the future development of the electricity market in Hong Kong on supply from the Mainland; and
- close monitoring and liaison with the relevant Mainland authorities on the supply situation in the Mainland is necessary.

Availability

The supply situation in Guangdong remains very tight. Demand for electricity grew by 35% between 1999 and 2001 and continues to grow at about 10% per year. Guangdong has relied heavily on power imports from neighbouring provinces and some power rationing has occurred. At present, Guangdong still has to import from Hong Kong to meet its demand, and its priority is therefore to ensure that it has sufficient installed capacity to meet its own demand rather than to supply Hong Kong.

Reliability

At present, reliability of supply, which requires both the generation plants and the networks to perform well, is under the full control of the two Hong Kong utilities. Thanks to adequate infrastructure and good asset management, Hong Kong’s supply reliability is among the highest in the world.

¹⁰ Stage II Consultation Paper, para 2.31.

California's energy crisis in 2000-2001 reminds us that if Hong Kong is to be supplied by South China, any capacity shortage suffered by South China will result in a reduction of imported electricity. As the networks of South China are much less reliable (Figure 8), Hong Kong will end up with deteriorated reliability in both generation and transmission.

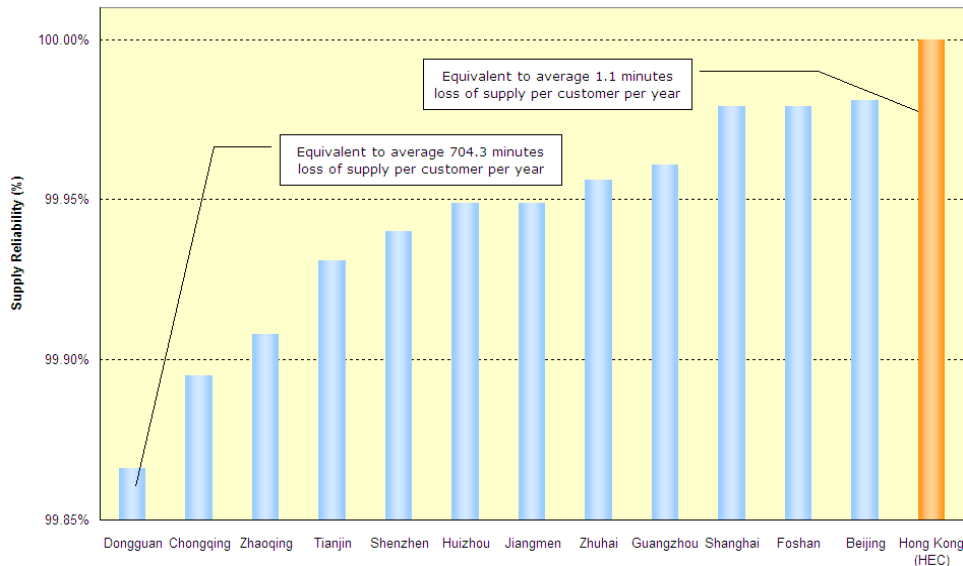


Figure 8: Electricity supply reliability of China municipalities and Pearl River Delta cities in 2004

Environment

Even if the supply and demand situation in Guangdong can be balanced in the medium to long-term via the import of hydro power from the neighbouring provinces/areas, the highly-polluting, low-efficiency small thermal plants operating in Guangdong will still pose an environmental threat to the whole Pearl River Delta region.

Economics

The above factors impact on the economic viability of importing electricity from the Mainland. Taking into account reliability and environmental standards, electricity imported from the Mainland will not necessarily be cheaper than electricity produced locally.

- In comparison to the rest of the Mainland, the electricity tariffs of the Guangdong Province are the highest of all provinces and municipalities in the country.¹¹

¹¹ Zeng Lemin, Zhang Chi, Chen Lijia and Xiang Xiaomin, 'Guangdong Electric Power Market Reform: Options and Impact' (Working Paper No. 33, Program on Energy and Sustainable Development, Stanford, 2004).

- In view of the long transmission distance from Guangdong to Hong Kong and the lack of reserve transmission capacity, it is likely that the transmission networks in Guangdong would need to be upgraded in order to have the capability to export electricity to Hong Kong. The costs associated with this would ultimately be borne by Hong Kong consumers.

Opening the market to Mainland supply exposes Hong Kong to significant reliability and supply risks for power that will not necessarily be cheaper.

2.14 Grid access

Any moves toward open access to the grid should be based on a careful cost-benefit analysis.

The main driver for an open access regime is to introduce greater competition in the supply of electricity. However, mandated open access is a radical departure from the existing form of regulation in Hong Kong. International experience provides a salutary lesson as to the difficulty and often financially disastrous effect of market reform.

HEC is of the view that at this stage, the higher costs and uncertainties involved in introducing such a regime, and the potential adverse impact on system reliability outweigh any potential competition benefits that may arise as a result of open access.

System reliability

International experience has shown that system reliability can degenerate under an open access regime. For example, it has been observed in the US that:

*“Whereas electricity grid reliability was expected, in fact taken for granted, during the era of franchise monopolies, reduced reliability and the potential for unexpected blackouts have surfaced as an undesirable by-product of electricity restructuring.”*¹²

Conflict with obligation to supply

Under the current regulatory regime, the two power companies are subject to an “obligation to supply”. A mandatory open access regime is inconsistent with an obligation being imposed on the power companies to ensure there is sufficient supply to service Hong Kong.

¹² M Whitfield, ‘Update on the Impact of Electricity Market Competition in the US on the Nuclear Industry’ (Paper presented at the Uranium Institute 25th Annual Symposium, London, 30 August - 1 September 2000) p 4.

If both an obligation to supply is retained in future regulatory periods and a mandatory access regime is introduced, it would lead to significant upward tariff pressure in the Hong Kong electricity market.

Set-up costs and ongoing costs

The introduction of such a major regulatory change, such as mandatory open access, would require substantial set-up costs that result from the creation of new organisations, the investment in new hardware and software and the changes to operating systems. It would require the introduction of a completely new legislative framework to deal with issues such as reliability standards and technical standards, access pricing, dispute resolution, liability between market participants and the establishment of an independent system operator.

Investment in Hong Kong

Imposing a legislated mandatory open access regime would also have wide reaching consequences for investment in Hong Kong.

Investors would be extremely sceptical of investing in the development of, or additions to, the electricity network where they know that:

- they will be required to share the asset with their competitors; and
- the investment can be further undermined by the electricity suppliers who have not contributed to the substantial investment that the current network owners have made, and will likely make in the future, and simply “piggy back” on that investment.

Access pricing and disputes

HEC is concerned that the current mandated access proposal does not address the issue of how fair compensation to the grid owners would be determined.

The cost implication of these disputes, together with the potential impact on future investment, is an important consideration in relation to any moves towards an open access regime.

Competition

The option to mandate open access is predicated on the assumption that competition in the electricity supply market in Hong Kong is a workable and cost-beneficial proposition.

There are a number of unique local factors which make it difficult to introduce meaningful competition to the Hong Kong electricity market, including its relatively small size, the lack of indigenous fuel sources, as well as the lack of infrastructure such as customer transfer processes and metering facilities to support competition.

Mandated open grid access is a radical departure that is inconsistent with the supply obligation of the power companies and could result in higher tariffs as they build reserve capacity. It is inappropriate to Hong Kong's small market and would require a complete overhaul of the regulatory framework.

Connection of renewable energy sources

HEC acknowledges that the development of RE sources is an important element of the Government's energy policy.

To that end, HEC was, in conjunction with EMSD, actively involved in the development of technical guidelines for the grid connection of small-scale RE power systems.

However, wind generation projects, particularly on a large scale, bring with them a host of technical and reliability issues.

To ensure that RE systems connected to the network do not jeopardise overall supply reliability and safety, HEC agrees with the Government that grid access for these facilities needs to be carefully considered on a case-by-case basis.

2.15 Increased interconnection between CLP Power Hong Kong Limited (CLP) and HEC

HEC agrees with the Government's views that:

- interconnection cannot displace the need for new generation facilities to meet growth in electricity demand; and
- enhanced interconnection between CLP and HEC to enable all customers in one supply area to choose a supplier in another area without constraint is not an economically viable position.

However, HEC disagrees with the Government's view that increasing interconnection will bring about greater system efficiency of the HEC and CLP systems and will result in the lowering of costs to consumers.

Increased interconnection cannot bring customer choice

In order to give customers choice as to their service provider, interconnection capability would have to be increased to "full access". Although this may be technically feasible, it is clearly not economically viable.

As recognised by the Government in the Stage I Consultation Paper:

- full customer choice would require the power companies to develop substantial additional generation capacity to cater for supplying customers in both service areas; and
- these significant upfront costs would be borne by all consumers while the perceived benefits would be uncertain and long in coming.¹³

Reliability

Both the Government and the public (through the Stage I consultation process) have stressed that maintaining reliability of supply remains the paramount consideration for the next regulatory period and beyond.

However, the potential impact on reliability associated with increased interconnection has not been considered in any detail by the Government in its proposals for increased interconnection.

These are not theoretical risks. Experience from overseas electricity markets has illustrated that operational and system disturbances can arise with highly interconnected systems.

As described in the report by the US - Canada Power System Task Force investigating the 14 August 2003 blackouts in North Eastern America in which 50 million people lost power after 265 power plants were tripped in a cascading manner:

“A cascade is a dynamic phenomenon that cannot be stopped by human intervention once started. It occurs when there is a sequential tripping of numerous transmission lines and generators in a widening geographic area. A cascade can be triggered by just a few initiating events, as was seen on August 14.”¹⁴

There is no benefit in increased interconnection.

2.16 Increased interconnection with Guangdong

Given that the supply situation in Guangdong remains very tight in the short to medium term, it is premature at this stage for the Government to institute any new arrangements for increased interconnection with Guangdong.

There are significant upfront costs associated with constructing new interconnectors with Guangdong which will result in immediate tariff pressure on consumers, while the benefits, if any, from greater interconnection are unclear and far off.

¹³ Stage I Consultation Paper, para 3.33.

¹⁴ US - Canada Power System Task Force, *Final Report on the August 14th Blackout in the US and Canada* (2004) p 73.

2.17 Conclusions and recommendations

The test of a successful regulatory regime is that it meets its policy objectives. The current SCA meets the Government's policy objectives but there is a real risk that the Government's proposals will not.

The existing SCA and HEC's performance provides a high standard - it 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 led to a significant reduction in pollution.

In contrast, the benefits of the Government's Stage II proposals have not been quantified but the costs and risks are obvious. The proposals do not represent an improvement over the existing regime. Many of them are inconsistent with best regulatory practice and electricity market reform. The fundamental flaw is their lack of balance.

It is imperative that the Government now take stock of the many substantial issues which have been raised. The fundamental importance of electricity supply and its reliability to everything in Hong Kong means that reform should not be rushed.

Grand designs for wholesale interconnection with and competition from Mainland China are not a realistic proposition in the medium term. There is time for Hong Kong to take a measured and incremental approach to these issues.

Responses to the Stage I Consultation, HEC's independent opinion survey, and the views of HEC's customers, especially the commercial sector that consume over 70% of HEC's electricity sales, have all indicated their unambiguous preference for safe, reliable and efficient electricity supply. They are also keen on improving the environment and maintaining tariffs at reasonable prices.

HEC believes that, in this Stage II Consultation, the Government's proposed radical realignment of rights, obligations and incentives is not appropriate for use in the Hong Kong electricity market. HEC reaffirms its view that the existing SCA should be renewed in substantially its current form.

HEC looks forward to working with the Government on a new SCA that will continue to contribute to the harmony and prosperity of Hong Kong.