

# **ENERGY ADVISORY COMMITTEE**

## **Electricity Market Review: Role of Regulator**

### **The Issue**

To review the role of the regulator in the electricity supply industry, and to consider possible options for the electricity market in Hong Kong.

### **Background**

2. Adequate and effective regulation of an electricity market is essential to ensuring supply reliability, continuous investments, reasonable pricing and proper market behavior. In a regulated market where competition is minimal or lacking, the regulator's role is to provide an oversight that would ensure that consumers receive reliable and safe supply of electricity at reasonable prices whilst balancing the investors' interest. In a liberalised market where selected segments of the supply chain are open for competition, the regulator's role is to provide the oversight to enable an efficient electricity market, ensure safe and reliable supply, and generate the signals for continuous investments.

3. In a traditional electricity market, the integrated services for generating, transmitting, distributing, wholesaling and retailing electricity are charged under a bundled tariff. This tariff and the supplier's infrastructure development plans are normally placed under the regulator's oversight.

4. In a liberalized market where the generation, wholesale and/or retail segments are open to competition, charges for these services are no longer regulated. The transmission and distribution segments, because of their natural monopolistic nature, would remain regulated to ensure fair and comparable access to the power grid. Their charges are regulated to ensure reasonable return on investments and continuous development of the infrastructure to meet future needs.

### **Overseas Practices**

5. Regulators in countries such as the USA, Australia, Canada and the UK are normally empowered by legislation to perform their regulatory roles.

While the detailed roles vary from one country to another, in broad terms they usually include approving charges submitted by the regulated business participants, and setting rules and standards and overseeing the performance of the unregulated market segments.

6. Unlike the UK where its national electricity market is fully liberalised, not all states and provinces in the USA, Canada and Australia have liberalised their electricity markets. For those markets that remain regulated, the key role of the regulators is to ensure that the bundled tariffs are just and reasonable, and that the suppliers' service and performance are satisfactory. The regulators also approve the suppliers' development plans, financial plans and proposed tariff level, and monitor their financial and technical performance.

7. For UK and those liberalised markets in the other three countries, the regulator's roles can be delineated according to the market segments. For the regulated segments, namely the power grid, the regulator oversees the charge rates, development plans and service quality, develops rules and processes to ensure non-discriminatory access to the power grid, and establishes technical standards and performance targets for the grid owners.

8. For the unregulated segments, the regulators' roles are expanded to include:

- (a) developing the market rules, codes and standards;
- (b) registering market participants and issuing licenses;
- (c) monitoring and enforcing compliance to the rules, codes and standards;
- (d) monitoring market behavior including abuse of market power; and
- (e) facilitating dispute resolution.

— Detailed discussion on the role of regulators in these countries are at Annex I.

### **Hong Kong Situation**

9. In Hong Kong, CLP Power and HEC are regulated via the Scheme of Control Agreements (SCAs). Under these agreements, CLP Power and HEC are obliged to provide reliable and safe supply of electricity at a price that is reasonable in the light of financial and other considerations to the consumers.

In return, these companies are allowed to earn up to a permitted rate of return on their investments. The Economic Development Branch of the Economic Development and Labour Bureau, with the support of the Electrical and Mechanical Services Department, is responsible for assessing the financial plans (which include the development plans of the generation and network and tariff levels) of the power companies through periodic financial review, and monitoring their financial and technical performance, etc, through annual auditing and tariff reviews.

### **Possible Options**

10. A range of regulatory role for the Hong Kong electricity market may be considered to suit the desired objectives and level of involvement deemed appropriate by the Government. While the various roles can be assessed on their own merit, the scope and depth of regulatory control should take into account the various market structure and regulatory regime options that may evolve.

*(A) Government to engage in bilateral agreements as a means of regulation: Status quo*

11. Should the SCAs continue to be used as the basic regulatory framework for the Hong Kong electricity market, the role of the regulator (i.e. the Government) would remain about the same as the current one, namely: agreeing on the rate of return on investment, and monitoring the financial plans and technical performance of the electricity suppliers. This approach is a rather simple regulatory regime with comparatively less government involvement in the business decision and operation and hence less administrative burden. It provides a mechanism that allows the Government to monitor electricity tariff while ensuring supply reliability. The disadvantage is that it binds the government to bilateral contracts that require both signing parties' agreement to implement any changes, and does not easily lend itself to supporting future market changes.

*(B) Reduced Role - Technical Regulation only*

12. Under this option, the Government will play a reduced role by providing an oversight on the technical performance of the power supply

companies only. The commercial aspects, namely, the business plan, tariff setting, infrastructure investment needs and finance performance, etc., will no longer fall under the government's oversight. The advantage of this option is that it reduces the government's regulatory involvement and administrative burden. The drawback, however, is that electricity suppliers will now be able to freely decide on their investment plans and set tariffs at whatever levels they desire. Without sufficient competition and customer's choice, the consumers' interest will be very difficult to protect, if at all.

*(C) Increased Role with Expanded Scope and Level of Market Regulation*

13. Consideration may be given to replacing the SCAs with a different regulatory framework, for instance, licensing or franchising. Through the granting of licenses or franchise rights, the regulator can introduce different or additional conditions, where desired and appropriate, to suit the regulatory needs for different market structures and regulatory regimes. With this more flexible approach compared to the SCAs, the regulatory functions may include:

- (a) issuing licenses or granting franchise rights for the electricity suppliers;
- (b) regulating charges (tariff) and approving development plans;
- (c) setting technical performance standards which may include common reliability standards and planning criteria;
- (d) monitoring the performance of the power companies; and
- (e) enforcing the licensing/franchising conditions.

But one key question to address is the grounds on which a franchise/licensing regime should be introduced and the legal implications.

14. Should the electricity market in Hong Kong evolve with further structural changes, such as introduction of increased competition to certain segments of the supply chain, the role of the regulator may need to be further expanded. For example, should Independent Power Producers (IPPs) be encouraged to compete for power supply, in addition to roles (a) to (e) above, the regulator may take on the role of:

- (a) authorizing entrance of the IPPs (e.g. through licensing);
- (b) developing rules and connection standards for generation competition;

- (c) monitoring market behavior and compliance to rules and standards;
- (d) developing and implementing mitigating measures against abuse of market power for the unregulated segments; and
- (e) handling appeals and facilitating a dispute resolution process.

15. If the purchasing segment (at wholesale and/or retail level) is also open for competition, then the power grid will need to be open for third-party access. The regulator also needs to develop a full set of market rules, with adequate grid access rules and codes in addition to the grid connection standards.

16. Charges for the services provided by generation and purchasing segments, when open for competition, will be market driven and hence no longer subject to regulatory oversight. Nonetheless, the regulator still monitors compliance of the participants in these segments to the technical standards and market rules. On the other hand, as the natural monopoly, the transmission and distribution network businesses will remain fully regulated. The regulator will regulate the connection and usage charges, service standards, expansion plans, etc.

17. Whilst expanded regulatory functions may be driven by market changes and appear to be necessary as more market features and complexity are introduced, added administrative burden and cost are the inevitable results. Overseas experience has shown that from a traditional, regulated market to a fully liberalised market, the number of staff engaged in regulatory function could increase by two or three-fold. The administrative burden and cost would thus need to be considered when assessing the benefit of introducing changes to the existing electricity market structure and regulatory regime. Another consideration is the legal implications should legislation be required to empower the regulator to perform some or all of the above functions.

#### *(D) Regulation by An Independent Entity*

18. While the above mentioned regulatory functions (particularly those in Option (C)) can continue to be undertaken by the Government, consideration may be given to setting up an independent entity to perform this regulatory role. For example, a regulatory board with internal technical support, empowered by legislation but administratively separated from the Government, may be established to fulfill this role. Members of the board can be so selected to

provide balanced representation from relevant stakeholder groups (e.g. consumers, investors, academics, LegCo members, etc.). Staffing of this regulatory board may be funded by the Government or via collection of license fee from market participants.

19. The merit of setting up a dedicated regulatory board with legislative backing is that the regulatory functions are more consolidated and the regulatory role can be very clearly defined and established on a firm legal basis. That the board is separated from the government and financed by the industry is amenable to achieving a “small-government” for Hong Kong SAR if such a direction is to be adopted. Furthermore, the regulatory process could be perceived to be more transparent, with wider involvement of relevant stakeholders including the consumers. When supplemented by an effective price regulatory regime, the board will need only to provide regulatory oversight mainly on the technical aspect and business process of the electricity market, with very minimal involvement (if at all) in the business decision and commercial aspect of the market participants except the grid.

20. The major challenge for this option is how to maintain real independency and impartiality in the board’s regulatory and decision process, thereby providing the regulatory certainty to attract continuous investments needed for supply reliability. Other challenges and issues associated with this option are: added bureaucracy thus slowing the decision process; perception that the Government has distanced itself from controlling the electricity supply sector; liability of the board on decisions made that may eventually affect supply reliability; and the additional setup cost and administrative cost. Although these costs could be covered by the license fee, they may eventually be passed on to the consumers.

## **Observations**

21. The role of regulator in different overseas jurisdictions is quite similar in broad terms, although the details of role allocation may differ depending on their respective governance structures and market reform progress. For Hong Kong, different market development options may precipitate different regulatory requirements. These requirements and the setups to deliver them will vary in accordance with the market structure and regulatory regime to be adopted.

### **Advice Sought**

22. Members are invited to offer views on the issue and recommend possible approaches on the role of regulator taking into account the unique situation in Hong Kong.

Economic Development and Labour Bureau  
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## Overseas Experience in the Role of Regulator

### *USA*

In the USA, most of the electricity utilities are investor-owned. Some utilities have their networks covering several states and some have interconnection across states. The regulatory framework of the electricity market is basically divided into two levels, the federal and state levels. The principal regulator at the federal level is the Federal Energy Regulatory Commission (FERC), and those at the state level are the public utility commissions (PUCs). FERC is an independent regulatory agency within the Department of Energy. FERC's regulatory scope covers both electricity and gas. On the electricity side, FERC's roles include regulating the transmission and wholesale of electricity in interstate commerce and licensing of hydroelectric projects.

2. The legal authority of FERC is derived from several laws, including the Federal Power Act of 1935, the Public Utility Regulatory Policies Act of 1978 and the Energy Policy Act of 1992. FERC is empowered to make rules and issue orders to implement the provisions of relevant legislation.

3. Under FERC Order 888 and 889, utilities are required to provide non-discriminatory third party access to their transmission network, and they have to file the rates of using their networks to FERC. FERC can set rates if it finds those filed by the utilities are not just and reasonable. FERC has a very elaborated accounting and financial reporting system for the utilities to submit their financial status. FERC also monitors the competitive condition of the market, and the utilities under FERC's jurisdiction are required to seek FERC's authorization for disposition of property, issuance and purchase of securities, including mergers and acquisitions.

4. FERC may investigate into violation of the relevant legal provisions, rules and regulation. FERC uses hearing as appropriate or as provided under the laws for making orders and investigating into violation cases. Any party aggrieved by FERC's order may apply for rehearing and may also apply to the US court of appeals for judicial review.

5. While FERC plays an important role in the regulatory control of transmission tariffs, the technical performance of the transmission system in the U.S.A. is being self-regulated by the industry itself, through a voluntary body



known as the North American Electric Reliability Council (NERC). NERC is enforcing the reliability standards for the industry on a voluntary basis, but is trying to seek legal authority for mandatory enforcement of the standards. FERC has an observer on the NERC's Board of Trustees.

6. As the system in the U.S.A. is highly interconnected, several wholesale market pools have been formed over such interconnected systems. PJM is one of the very prominent wholesale electricity markets in the USA. Its service territory covers areas of Pennsylvania, New Jersey, Maryland, Delaware, West Virginia, Virginia, Ohio and the District of Columbia. PJM operates a day-ahead energy market and a real-time energy market. It is also the independent system operator responsible for the reliable operation of the interconnected PJM transmission system. PJM, like other wholesale market pools, has established a set of market operating rules for the participants to follow. PJM has also set up a market monitoring unit, which is tasked for monitoring and reporting on issues relating to the operation of the PJM market and proposing follow up action and enforcement mechanism as necessary.

7. At state level, the regulatory responsibilities of electricity utilities are within the jurisdiction of the PUC. Most of these PUCs typically enjoy broad regulatory authority to ensure that electric utilities in their jurisdiction provide services of good quality at reasonable prices to their customers. Following the federal drive to promote industry competition, there have been many state level initiatives to introduce competition at the retail level. Pennsylvania is one of such states which has introduced retail competition.

8. In Pennsylvania, the Electricity Generation Customer Choice and Competition Act was enacted in December 1996. The law allows consumers to choose among competitive generation suppliers according to a phased programme. The dominant suppliers, which were vertically integrated utilities with captive customers, were required to submit compliance plans to the Pennsylvania Public Utility Commission (PAPUC) and some of them had chosen to divest their generation assets. These utilities had retained their Electricity Distribution Company (EDC) status, and they provide distribution network service at regulated rates and serve as the supplier of the last resort<sup>1</sup>. Some of the main roles of the PAPUC include:

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<sup>1</sup> They are the default suppliers for those customers which did not switch to an alternative supplier and for those whose chosen alternative supplier failed to provide a supply.

- (a) issuing electric generation supplier licenses;
- (b) regulating transmission and distribution rates;
- (c) prescribing duties and monitor customer service performance of EDC;
- (d) setting standards related to operation and maintenance;
- (e) ensuring continuation of safe and reliable electric service to all customers;
- (f) approving utilities restructuring plan;
- (g) determining stranded costs and allowing recovery through competitive transition charge;
- (h) monitoring competitive conditions on supply and distribution of electricity to retail customers; and
- (i) investigating upon complaint or upon its own motion, including effect of mergers, consolidations, acquisition or disposition of assets.

Many of PAPUC regulatory decision making processes are conducted through hearings, and orders are issued based on results of such processes. Affected parties can appeal to the courts should they wish to challenge the PAPUC orders.

9. Not all states in the U.S.A. have introduced retail competition in their electricity supply industry. Florida is one of those states which has apparently no plan in the near term to open up its retail electricity market for competition. The regulator of the public utilities in Florida is the Florida Public Service Commission (FPSC), and it acts under the Florida Statutes and Rules. The key roles of FPSC include:

- (a) making rules governing utility operations;
- (b) hearing and resolving complaints, issuing written orders;
- (c) regulating charges and rates of public utilities;
- (d) ensuring public safety and help the public deal with regulated companies;
- (e) monitoring reserve margin and setting generation reliability standards;
- (f) establishing regulatory standards and applying them in a fair and consistent manner; and
- (g) encouraging maximum efficiency in utility company operations and management.

All orders of the FPSC are subject to judicial review. For orders affecting rates, appeals have to be made direct to the Florida Supreme Court.

### *Canada*

10. Canada is different from the U.S.A. in that most of the electricity utilities are government-owned, with Alberta being the exception where the major utilities are investor-owned. Regulatory responsibility of the electricity supply industry is principally held at the provincial government level, and development of electricity market varies among provinces. Ontario and Alberta are the two provinces which have advanced progress in liberalizing their electricity market down to retail level. Both provinces have regulated third-party access to the networks.

11. Independent regulatory agencies in the provinces develop and enforce regulation within the framework set by the relevant provincial ministries. For example, the Ontario Energy Board (OEB) has regulatory oversight of both natural gas and electricity matters in Ontario and it advises on energy matters referred to it by the provincial Minister of Energy, Science and Technology. In the electricity sector, OEB's regulatory roles include approving the transmission and distribution rates, approving mergers and acquisition of transmission and distribution companies, monitoring market efficiency and fairness, and licensing all market participants. Under the Electricity Act of 1998, the Ontario government created the Independent Electricity Market Operator (IMO) to act as the impartial administrator of Ontario's wholesale electricity markets and manage the reliability of the transmission system. The IMO is a non-profit organization with its directors appointed by the Ontario government. IMO administers a set of market rules that govern the operation of the market. Market participants who breach the rules or who have not met their financial obligations, may be subject to sanctions, which may include rectification, financial penalties or suspension from the market, etc. IMO is also responsible for preparing annually a 10-year forecast and quarterly an 18-month forecast on the electricity demand of Ontario.

12. In Alberta, the Energy and Utilities Board performs similar regulatory roles as the OEB in Ontario, but the industry structure is somewhat different. While the Power Pool of Alberta operates the wholesale energy market, a transmission administrator (TA) is responsible for the access

management and development planning of the transmission network. Market surveillance (including monitoring of the conduct of market participants) is the responsibility of the Market Surveillance Administrator under the Power Pool of Alberta. There is a plan to merge TA and Power Pool of Alberta to form an independent system operator in 2003.

*UK*

13. In the U.K., the electricity market has gone through many major changes. Privatization and compulsory wholesale pool were introduced in late 1980s/early 1990s. The compulsory pool-based market was subsequently replaced by a contract-based market under the New Electricity Trading Arrangement in 2001. The Office of Gas and Electricity Markets (OFGEM) is the main regulatory authority. OFGEM was formed in 1999 by combining the functions of the former Office of Gas Supply and the Office of Electricity Regulation. The main roles of OFGEM in the electricity sector include:

- (a) granting licenses to those who supply, distribute, transmit and generate electricity;
- (b) enforcing the conditions of the licenses and investigating complaints;
- (c) resolving disputes between consumers and suppliers;
- (d) setting standards of performance on customer services;
- (e) providing other consumer protection measures such as establishing customer representation, fixing maximum charges for reselling electricity, etc.; and
- (f) overseeing the competition and the development of the electricity supply industry.

14. OFGEM's powers over electricity industry are mainly provided under the Electricity Act 1989 and the Utilities Act 2000 (UA). OFGEM is empowered by the UA to make a license modification following the reference to the Competition Commission (CC), while the Department of Trade and Industry has veto power over the license conditions. OFGEM can impose financial penalties on the licensees who are found to have contravened the license conditions and requirements. The licensees may appeal to the Appeal Tribunals of the CC against the decisions of OFGEM.

15. The National Grid Company (NGC), being the transmission network owner and operator in England and Wales, is one of the licensees of OFGEM. Under the license, NGC is required to prepare each year a 7-year statement that indicates the transmission circuit capacity, forecast power flows and loading, etc. for the 7 succeeding financial years. The statement is aimed to enable any party seeking for the use of the transmission system and considering investment in the generation sector to identify and evaluate opportunities available.

16. Provisions are incorporated in the transmission license of NGC concerning the establishment and implementation of several codes which govern many important aspects of the electricity market and transmission systems. The enforcement of these Codes among the market participants and the network users is through the license conditions and in other words, a breach of the Code will mean a breach of the license conditions and is enforceable by the regulator (OFGEM).

#### *Australia*

17. In Australia, the National Electricity Market (NEM) was introduced in 1998, which was based on a compulsory wholesale pool structure. An independent national electricity regulator was established - the Australian Competition and Consumer Commission (ACCC), which regulates the electricity transmission network business. ACCC is also the competition authority in Australia and its regulatory authority also covers gas, telecommunications and airports. The main functions of ACCC in the electricity sector include:

- (a) developing and enforcing service standards for transmission network performance;
- (b) determining annual revenue requirements for the transmission companies for a five-year period;
- (c) approving interconnector proposals;
- (d) evaluating and approving changes to the codes that govern the operation of the market;
- (e) investigating market behavior; and
- (f) evaluating mergers.

18. ACCC's power as a regulatory authority in the NEM is mainly based on the Trade Practices Act, Prices Surveillance Act and the National Electricity Code.

19. The NEM in Australia is administered and operated by the National Electricity Market Management Company Limited (NEMMCO). NEMMCO is a self-funding organization, with the State governments (of those states participating in the NEM) being NEMMCO's shareholders, and each government appoints a director to make up the NEMMCO Board. NEMMCO conducts the market and system operations according to the National Electricity Code (NEC). NEMMCO also monitors the future adequacy of generating capacity based on plant availability information. Each year NEMMCO publishes a Statement of Opportunity (SOO) which predicts market trends for the following 10 years. The SOO outlines the system capability, and supply and demand forecasts for each jurisdiction in the NEM.

20. As mentioned above, NEC governs many facets of the NEM. The body which supervises, administers and enforces the NEC is the National Electricity Code Administrator (NECA). The functions of NECA include:

- (a) monitoring and reporting on compliance with the Code and the adequacy of the Code;
- (b) enforcing the Code;
- (c) establishing procedures for dispute resolution concerning the provisions of the Code;
- (d) managing changes to the Code; and
- (e) publishing annually performance indicators to monitor NECA's performance in respect of its objectives.

21. NECA is also vested with the market surveillance role. Under such role, NECA is responsible for monitoring the performance of the market, conducting investigations and ensuring compliance with the NEC. In the case of a breach of the NEC, NECA can take appropriate action either through initiating action before the National Electricity Tribunal<sup>2</sup>, or entering into voluntary agreements with market participants to implement compliance programs.

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<sup>2</sup> The National Electricity Tribunal has been established under the National Electricity Law to review decisions of the NECA and NEMMCO, including NECA's decisions to impose civil penalties for breaches of the NEC. It hears and determines applications by NECA on cases of code breaches.

22. At the state level, the state regulators oversee mainly the distribution and retail side of the electricity market. For example, the Essential Service Commission (ESC) is the state regulator in Victoria. The ESC regulates electricity, water, gas, grain handling and ports within the state of Victoria. The functions of ESC related to electricity include the following:

- (a) approval of tariffs for distribution and franchised consumers;
- (b) setting service standards for distribution and retail services;
- (c) monitoring market conduct of retailers and distributors; and
- (d) issuing licenses for all electricity companies in Victoria.

23. ESC's regulatory powers are set out in the Essential Service Commission Act 2001 and the Electricity Industry Act 2000 of Victoria.