ENERGY ADVISORY COMMITTEE

Updates of Guangdong's Electricity Market

Introduction

This paper provides an overview of the recent developments in Guangdong's electricity market.

Background

2. The electricity market in Mainland China is undergoing major reform with the objective to establish an electricity market that facilitates separation of government functions from enterprise management, fair competition, orderly liberalisation and healthy development. In December 2002, a major restructuring for the State Power Corporation (國家電力公司, SPC) was formally announced, including the formation of five generation groups and two grid companies[1] to take up the management and control of all government-owned electricity supply asset of SPC across the whole country. The State Electricity Regulatory Commission (國家電力監管委員會, SERC) was also established to take up the main regulatory role for the electricity market, which includes implementation of the reform process and establishment of market development plan.

3. During 2003 and in early 2004, SERC announced its plans to develop several regional electricity markets in Northeast China, East China and South China respectively. Trial operation of the Northeast China market commenced in January 2004 while the East China market is scheduled to begin its trial operation by mid 2004. SERC's current plan is to start trial operation of the South China market in 2005, which covers the provinces of Guangdong, Guangxi, Guizhou, Yunnan and Hainan.

[1] The 5 generation groups are: China Huaneng Group (中國華能集團), China Datang Group (中國大唐集團), China Huadian Group (中國華電集團), China Guodian Group (中國國電集團) and China Electricity Investment Group (中國電力投資集團). The 2 grid companies are: State Grid Corporation (國家電網公司) and China Southern Power Grid Company Limited (中國南方電網有限公司).

Recent Developments in Guangdong

4. The electricity supply industry in Guangdong was not owned or operated by SPC. Before 2001, the transmission network and majority of the generation asset in Guangdong were under the control of the Guangdong Electric Power Holdings Company (廣東省電力集團公司, GEPHC), which was owned by the provincial government. In August 2001, the GEPHC split into two companies, namely the Guangdong Yuedian Assets Management Co. Ltd. (廣東省粵電資產經營有限公司) and the Guangdong Guang-Dian Power Grid Group Co. Ltd. (廣東省廣電集團有限公司), to manage and control the respective generation and transmission asset owned by the provincial government. The Guangdong Yuedian Assets Management Co. Ltd. was renamed in 2003 as the Yuedian Group Co. Ltd. (粵電集團有限公司) while the Guangdong Guang-Dian Power Grid Group Co. Ltd. became part of the China Southern Power Grid Company Limited (中國南方電網有限公司, CSG) formed in 2002 to take up the control of all transmission power grids in Guangdong, Guangxi, Yunnan, Guizhou and Hainan.

5. The generation fuel mix in Guangdong is made up of roughly 76% thermal power, 15% nuclear power and 9% hydro power plus other sources[2]. Some of these supply sources are "centrally dispatched" while some are not. "Centrally dispatched" supply sources refer to those controlled centrally by the provincial system control center, which include major generation sources available within the province and power imports from western provinces and Hong Kong, etc. "Non-centrally dispatched" supply sources, which amount to about 40% of the total generation capacity in the province, are mainly small local generators not controlled by the provincial system control center. In general, in terms of meeting system demand, these generators are not as dependable as their "centrally dispatched" counterparts.

6. There are electricity supply bureaux at municipal/county levels for the distribution of electricity supply in Guangdong to local consumers. Guangdong also imports electricity from neighbouring provinces/areas, including Guangxi, Yunnan, Guizhou and Hong Kong, to meet local demand.

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[2] Based on electrical energy generated in 2003.

Supply and Demand Balance

7. Guangdong has experienced tight electricity supply situations in recent years owing to the much higher than expected demand growth driven by rapid economic development. In 2003, for example, the maximum demand of "centrally dispatched" supply sources in Guangdong reached 25.3 GW, representing an increase of 26% over the 2002 maximum demand. The reserve capacity (counting only the "centrally dispatched" supply sources) was less than 1% and hence a high level of power import was required from neighbouring provinces/areas[3]. Some power rationing had also taken place to even out the peak demand[4].

8. Tight electricity supply and demand situation in Guangdong continued in 2004. Shortage in water resources due to dry weather in the western provinces has affected Guangdong's power import[5], and recent shortage in coal supply throughout the country added pressure to the province's already tight power supply situation. While a new transmission circuit has been commissioned in mid 2004 for importing power from the Three Gorges to Guangdong, only limited support is available since power export from Three Gorges is shared by other provinces/regions that are also suffering from power shortage.

9. Although the forecast prepared earlier by the Development Planning Commission of Guangdong Province[6] had indicated that balanced supply and demand situation in Guangdong could be achieved in the medium to long-term, there are still uncertainties due to the rapidly changing situation. For instances, the less dependable "non-centrally dispatched" supply sources and the phasing out of highly polluting small thermal power plants with low efficiency might cause the predicted generation capacity not fully realisable. Moreover, the demand forecast might not have taken into account the high growth rates over the past two years, which means that the actual demand growth would surpass the earlier projection.

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[3] During the peak period in August 2003, total power import from western provinces and Hong Kong was about 6.6 GW, i.e. about 26% of "centrally dispatched" maximum demand.

[4] It was reported that mandatory power rationing started to take place in 8 cities since March 2003, due to higher than expected demand. In the first quarter of 2004, 21 cities/areas were subjected to mandatory power rationing.

[5] Due to the drought, power import from the western province in the first quarter of 2004 has dropped by more than 40% as compared to the same period in 2003.

[6] Based on that forecasted in 2001 at the beginning of the Tenth 5-year Plan from 2001 to 2005.

Power Grid Development and Supply Reliability

10. The 500kV transmission network is the backbone of Guangdong's power grid, which is part of the South China power grid, with inter-provincial interconnection between Guangdong, Guangxi, Guizhou and Yunnan. Guangdong has planned to invest about RMB 60 billion to enhance its power grid during the Tenth 5-year Plan. With the commissioning of new 500kV transmission circuits from Guizhou to Guangdong in June 2003, the power import capability from the western provinces to Guangdong has reached 5.2 GW. This, together with the transmission circuit from the Three Gorges completed in mid 2004, could provide a total power import capacity of over 20% of the total demand in Guangdong.

11. The Guangdong power grid is also interconnected with that of Hong Kong at 400kV and 132kV levels. These inteconnectors are mainly for CLP Power to import power from its affiliated supply sources, i.e. the Guangdong Nuclear Power Station at Daya Bay and the Guangzhou Pumped Storage Power Station at Conghua, and for the contracted power sales from CLP Power to Guangdong.

12. As Guangdong will continue to depend heavily on power import, the reliability of inter-provincial power transmission is crucial to the supply reliability of Guangdong. Regarding the reliability performance of local power grids, service availability figures for major cities were in general found to be lower than those achieved in Hong Kong, e.g. the service availability for Guangzhou in 2002 was reported to be about 99.96%[7] compared to Hong Kong's 99.99%.

Observations

13. It is anticipated that electricity supply and demand balance in Guangdong will remain tight in the near future, and the province will continue to rely heavily on power import to meet local demand. Some measures have been announced by CSG to tackle the tight supply situation in the near future, which include speeding up power grid reinforcement projects, strengthening system operation and coordination, securing power delivery from the western provinces

[7] Based on the report of the China Electricity Council.

and the Three Gorges, promoting demand side management and energy saving, exploiting full capability of existing generating resources, etc.

14. Since the electricity market and power system development in Guangdong are still undergoing changes and the growth in demand is difficult to predict, future electricity supply and demand situation of the province will remain uncertain. Information available so far suggests that Guangdong, together with many parts of Mainland China, would continue to face shortage of electricity supply in the short term, and whether the situation would improve in the longer terms are uncertain. Impacts of such power shortage on the electricity market reform and the power system development planning of Guangdong are difficult to predict at this stage. We will continue to closely monitor developments in Guangdong to take cognizance of possible "sourcing" and implication for our electricity market.

Members' Advice

15. Members are invited to note the content of the paper.

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