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Panel on Development

Meeting on 25 May 2010

Background brief on Total Water Management

Purpose

This paper provides background information on water resource management in Hong Kong and summarizes the concerns and views expressed by Members on the subject.

Background

2. Water is a precious natural resource. In Hong Kong, the responsibility of managing water resources rests with the Water Supplies Department which, apart from providing fresh water to Hong Kong people, also provides seawater for flushing purposes to nearly 80% of the population. Hong Kong enjoys a reliable supply of fresh water. About 20% to 30% of Hong Kong's fresh water supply is surface water collected from local water gathering grounds, and the remaining 70% to 80% has to be imported from Guangdong province.

3. Total water management (TWM) is a modern concept for managing water resources in all aspects. TWM seeks to achieve an optimal balance between water demand and water supply in order to ensure sustainable use of water resources. In the 2003 Policy Address, the Administration pledged to implement a TWM programme to enhance water conservation and water resource protection, and to explore new water resources. In October 2005, WSD commissioned a study to examine the fresh water demand and supply situations in Hong Kong and to evaluate all major options of water supply and demand measures in terms of quantity of water saved or supplied, cost effectiveness, environmental impact, and public acceptance. The Administration adopted a TWM strategy based on the findings of the study and

after consultation with the Legislative Council, relevant advisory committees, experts and stakeholders. A TWM strategy is required to better prepare Hong Kong for uncertainties such as acute weather changes and low rainfall. It also helps enhance Hong Kong's role as a good partner of other municipalities in the Pearl River Delta in promoting sustainable use of water in the light of the region's rapid growth in water demand. The Administration's TWM strategy aims to manage the demand and supply of water resources in an integrated, multi-sectoral and sustainable manner.

Water demand management

4. The Administration's initial emphasis on the TWM strategy is on reducing demand by stepping up water conservation as follows:

- (a) enhancing public education on water conservation by regularly launching public education and publicity programmes to promote water conservation in all sectors;
- (b) promoting use of water saving devices and developing a voluntary Water Efficiency Labelling Scheme to facilitate consumers in choosing such devices;
- (c) providing leakage control through the territory-wide replacement and rehabilitation programme to replace and rehabilitate aged water mains, and application of new technology to improve pressure management and detection of leakage; and
- (d) extending use of seawater for toilet flushing whenever it is economically justified.

Water supply management

5. As regards supply management, the focuses are:

- (a) strengthening protection of water resources by developing the water pollution risks and impact assessment framework for protection of water resources from development in water gathering grounds, and improving the existing catchwater system for safe and effective collection of surface water;
- (b) actively considering water reclamation by using lower quality water to replace high quality water currently used for non-potable purposes; and

- (c) developing the option of seawater desalination based on reverse osmosis technology.

Supply of Dongjiang water

6. The long-term supply of Dongjiang water to Hong Kong is secured under agreements with the Guangdong Provincial Government. The current agreement has an ultimate annual supply quantity of 1 100 million cubic metres (mcm). The target date for achieving this ultimate quantity will be subject to future review. Hong Kong can inform the Guangdong side the actual demand of the territory on a monthly basis, thereby enabling a better control of the storage level in Hong Kong, minimizing overflow and saving pumping costs.

Previous discussions by Members from 2008 to 2010

Discussions at the Panel on Development

7. The Administration briefed the Panel on Development (the Panel) on TWM on 27 May 2008 and supply of Dongjiang water on 28 October 2008. The concerns and views expressed by members at the meetings are summarized below.

8. Members were concerned that about 23% of the annual consumption of fresh water was wasted due to water pipe leakage and urged the Administration to expedite the replacement and rehabilitation programme for aged water mains. The Administration advised that it aimed to complete the programme in 2015, replacing some 3 000 km of the aged water mains which were more prone to bursting. The Administration would expedite the works as far as practicable. The water leakage rate could be reduced to 15% upon completion of the programme. In order to prolong the service life of the water mains, the Administration would implement a new technique of Comprehensive Pressure Management to optimize water mains pressure.

9. Most members were supportive of the use of seawater for toilet flushing purposes. They asked whether the extension plan of using seawater for toilet flushing could be accelerated. The Administration advised that the extension works of the supply of seawater toilet flushing to Pokfulam would commence in early 2009, and works for Yuen Long and Tin Shui Wai would commence in mid-2009. The Administration would expedite the works concerned as far as practicable.

10. Noting that the ultimate annual Dongjiang water supply quantity was set at 1 100 mcm as against the actual annual supply quantity of about 800 mcm, some members were concerned whether the "reserved capacity" would lead to a higher purchase price. They asked whether the Administration would negotiate for a lower ultimate supply quantity, whether a lower ultimate supply quantity would have any effect on the Dongjiang water price, and whether there would be flexibility in Dongjiang water price. The Administration explained that it was necessary to retain the ultimate supply quantity of 1 100 mcm for long-term planning purposes and development needs. Even if the quantity was reduced, it would have no bearing on the water price of Dongjiang water as the price of Dongjiang water would be set out in the agreement. It would be impossible to ask for a low water price with a small quantity but at the same time requiring a large guaranteed supply. The Administration also advised that there was no "reserved capacity" under the agreement for the supply of Dongjiang water.

Discussions at the Finance Committee

11. When examining the funding proposal for a supplementary provision for Dongjiang water purchase cost at the Finance Committee meeting on 21 November 2008, Members expressed concerns about seawater desalination and use of reclaimed water, construction of new reservoirs and public education on water conservation.

12. In response to Members' enquiries on the reverse osmosis technology and use of reclaimed water, the Administration advised that the reverse osmosis technology was a well-proven technology that had been tried out successfully in Hong Kong in the two pilot projects in Tuen Mun and Ap Lei Chau. However, the unit costs for each cubic metre of desalinated water and Dongjiang water were about \$10 and \$6 respectively. As such, the Administration would keep abreast of the development of the technology to see if seawater desalination could become a reliable and cost-effective source of fresh water. As for the use of reclaimed water for non-potable purposes, the Administration was conducting a pilot scheme at Shek Wu Hui Sewage Treatment Works on water reclamation. Subject to the results of the pilot scheme, reclaimed water might be provided to Sheung Shui and Fanling areas for toilet flushing and other non-potable purposes.

13. On a Member's suggestion that instead of relying heavily on Dongjiang water, the Administration should explore measures such as construction of new reservoirs in Hong Kong, the Administration advised that due to geographical constraints, it would be difficult to identify sites for new reservoirs. Besides, even with more reservoirs, there would still be no guarantee of reliable and adequate supply of surface water.

14. Some Members considered it necessary for the Administration to step up public education on water conservation. The Administration advised that as part of the TWM strategy, public education on water conservation would be enhanced for all sectors, in particular the younger generation. Besides, the Administration would introduce the Water Efficiency Labelling Scheme to facilitate consumers in selecting plumbing fixtures and appliances that could help conserve water.

15. At the special meeting of the Finance Committee on 26 March 2010, some Members asked whether the Administration had any plans to extend the use of seawater for toilet flushing, and whether rain water from drainage tunnels could be collected and converted into drinkable water or used for toilet flushing. The Administration advised that it would seek additional resources to implement more projects on using seawater for toilet flushing if these were feasible and cost-effective. The option of collecting rain water from drainage tunnels for other uses was not considered sustainable as it required a huge storage tank to collect the rain water and a lot of energy was required to pump the rain water up to the reservoirs.

16. On concerns about reducing water mains leakage, the Administration advised that after the completion of the replacement and rehabilitation programme for aged water mains by 2015, it was expected that the leakage rate would be further reduced to 15% from the current rate of 21%. New technologies were introduced to step up inspection of water mains.

17. Members also urged the Administration to organize more public education programmes on water conservation and asked if the Administration would require developers to introduce water conservation measures and incorporate such requirements for the new building designs. The Administration advised that a package of measures would be implemented on management of water resources. There were also incentive measures to encourage water-saving by developers on a voluntary basis.

Latest development

18. The Administration will brief the Panel on the implementation of TWM initiatives at the meeting on 25 May 2010.

References

19. A list of relevant papers with their hyperlinks is in the **Appendix**.

Council Business Division 1
Legislative Council Secretariat
19 May 2010

Total Water Management

List of relevant papers

Council/Committee	Date of meeting	Paper
Panel on Development	27 May 2008	<p>Administration's paper on "A Strategy for Total Water Management in Hong Kong" (LC Paper No. CB(1)1602/07-08(08)) http://www.legco.gov.hk/yr07-08/english/panels/plw/papers/dev0527cb1-1602-8-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)2309/07-08) http://www.legco.gov.hk/yr07-08/english/panels/plw/minutes/de080527.pdf</p>
Panel on Development	28 October 2008	<p>Administration's paper on "Dongjiang Water Supply" (LC Paper No. CB(1)90/08-09(03)) http://www.legco.gov.hk/yr08-09/english/panels/dev/papers/dev1028cb1-90-3-e.pdf</p> <p>Background brief on "New arrangement for supply of Dongjiang water" (LC Paper No. CB(1)90/08-09(04)) http://www.legco.gov.hk/yr08-09/english/panels/dev/papers/dev1028cb1-90-4-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)395/08-09) http://www.legco.gov.hk/yr08-09/english/panels/dev/minutes/dev20081028.pdf</p>

Council/Committee	Date of meeting	Paper
Finance Committee	21 November 2008	<p>Administration paper on "Supplementary provision of \$84.4 million under Head 194 Water Supplies Department Subhead 223 Purchase of water to meet additional water purchase cost in 2008-09" (FCR(2008-09)45) http://www.legco.gov.hk/yr08-09/english/fc/fc/papers/f08-45e.pdf</p> <p>Minutes of meeting (LC Paper No.FC82/08-09) http://www.legco.gov.hk/yr08-09/english/fc/fc/minutes/fc20081121.pdf</p>