

For information

**Legislative Council
Panel on Development
Supply of Dongjiang Water**

PURPOSE

The current three-year agreement with the Guangdong (“GD”) authorities adopting the “package deal lump sum” approach for the supply of Dongjiang (“DJ”) water¹ is due to expire by the end of 2020 (“the Current Agreement”). This paper briefs Members on the agreement for the supply of DJ water in the next three years between 2021 and 2023 (“the New Agreement”).

THE NEW AGREEMENT

2. A “package deal deductible sum” approach will be adopted in the New Agreement. This is an enhanced “package deal lump sum” approach by introducing a price deduction mechanism for reduced importation of DJ water. The New Agreement will include the following major features –

- (a) an annual supply ceiling of 820 million cubic metres (“mcm”) of DJ water is to be retained in order to meet the actual needs of Hong Kong with 99% reliability² in water supply for the three-year period between 2021 to 2023;

¹ Under this approach, Hong Kong will pay an annual lump sum to GD and has a right to import DJ water based on our need up to an annual ceiling.

² “99%” reliability means that water supply is maintained round-the-clock even under an extreme drought with a return period of one in 100 years. “Return period” is the average number of years during which an event will occur once statistically. A longer return period means a rarer chance of occurrence.

- (b) the annual ceiling water prices³ for 2021 to 2023 are Hong Kong Dollar (“HKD”) 4,885.53 million, HKD4,950.51 million and HKD5,016.35 million respectively;
- (c) a water price deduction mechanism is to be adopted with the following features –
- (i) a deduction from the annual ceiling water price, based on the quantity of DJ water conserved (i.e. the difference between the annual supply ceiling and the actual quantity of DJ water imported) in a particular year using a unit rate. The unit rates for each cubic metre (“m³”) of DJ water conserved for 2021 to 2023 are HKD0.300, HKD0.304 and HKD0.308 respectively;
 - (ii) the new water price deduction mechanism should have a longer application period and be adopted for at least up to 2029 (assuming 3 three-year DJ water supply agreements including the New Agreement); and
 - (iii) a minimum annual DJ water supply quantity of 615 mcm from 2021 to 2023, as well as a long term average annual DJ water supply quantity which should not be less than 700 mcm over the nine-year period covering the New Agreement and the subsequent agreements as mentioned in (ii) above;
- (d) the ultimate annual DJ water supply quantity of 1 100 mcm is to be maintained to cater for unforeseen situation;
- (e) assurance from the GD side to maintain the quality of DJ water supplied to Hong Kong in compliance with Type II⁴ water in the

³ The annual ceiling water price is renamed from the annual lump sum water price in the Current Agreement. The annual lump sum water prices for 2018 to 2020 under the Current Agreement are HKD4,792.59 million, HKD4,807.00 million and HKD4,821.41 million respectively.

⁴ There are five types of surface water standards designated for specific environmental functions and protection objectives in the Environmental Quality Standards for Surface Water (GB 3838-2002). Type I standard is mainly applicable to source water and national nature reserve and is not for abstraction for human consumption. Type II standard is mainly applicable to first class protection area for the abstraction for human consumption. It is therefore the highest national standard for surface water applicable for the abstraction for human consumption.

Environmental Quality Standards for Surface Water (GB3838-2002), which is the highest national standard for surface water applicable for the abstraction for human consumption; and

- (f) the actual water price for 2021 (after the deduction for DJ water conserved) is to be frozen at the 2020 level (i.e. HKD4,821.41 million), which is a special arrangement of the GD side to ease the financial burden of Hong Kong arisen from the COVID-19 epidemic.

JUSTIFICATIONS

Provision of Reliable Water Supply to Hong Kong

3. Over the past five years, the annual fresh water consumption of Hong Kong was around 1 000 mcm. The local water resource, which mainly comes from rainfall, is inadequate. The amount of local yield is also unstable due to fluctuation in rainfall year by year⁵. DJ water, which now provides about 70% to 80% of our fresh water supply, is able to fill the gap due to the inadequate local yield in meeting the water demand. Therefore, a reliable and stable DJ water supply arrangement is essential for Hong Kong.

Package Deal Deductible Sum

4. In the last five DJ water supply agreements covering the period from 2005 to 2020 inclusive, a “package deal lump sum” approach was adopted to ensure a reliable and flexible supply of DJ water to meet the actual needs of Hong Kong. This approach enables us to import DJ water as needed each year up to an annual supply ceiling specified in the water supply agreements and, at the same time, avoids unnecessary wastage of surplus DJ water resources and saves our pumping cost when more local yield is available in a particular year.

5. The “package deal lump sum” approach has been adopted for over 15 years. As the approach contains a fixed annual lump sum water price

⁵ In the past 30 years (1990-2019), the annual rainfall in Hong Kong varied from 1 487 millimetres (“mm”) to 3 343 mm; and the annual yield collected from our local catchment fluctuated between 103 mcm and 385 mcm.

irrespective of the actual quantity of DJ water supplied in that year, there have been public requests for adoption of an alternative “payment on actual supply quantity” approach. In this connection, we set up a Working Group with the GD side (“the Working Group”) in August 2017 to review the payment approach.

6. After rounds of discussions in these three years, the Working Group agreed that the “package deal lump sum” approach should continue to be adopted largely but an adjustable element of water price deduction according to the actual amount of DJ water supplied would be introduced (collectively named as “package deal deductible sum” hereafter). In essence, the actual annual water price in the “package deal deductible sum” under the New Agreement can be expressed by the following formula –

$$\begin{array}{r} \text{Actual} \\ \text{water price} \\ \text{for a} \\ \text{particular year} \end{array} = \begin{array}{r} \text{Annual ceiling} \\ \text{water price} \end{array} - \begin{array}{r} \text{Price deduction when} \\ \text{actual DJ water supplied is less} \\ \text{than the annual supply ceiling} \end{array}$$

The salient features, details and underlying considerations of the “package deal deductible sum” in the New Agreement are provided below.

(a) *Continuous adoption of “Package Deal Lump Sum” approach but modified by a water price deduction mechanism*

7. Besides Hong Kong, DJ water is an important water resource to other GD cities including Heyuan, Huizhou, Dongguan, Guangzhou and Shenzhen. The water resource utilization rate of the DJ river basin has already reached a level very close to its exploitation limit indicating a fairly tight supply of water resources. Furthermore, the average annual per capita water resource in the DJ river basin is only 1 100 m³ which is substantially lower than that of the GD Province and the whole nation of 2 100 m³ and 2 200 m³ respectively. Worse still, the fast pace of economic development of various GD cities will intensify the competition for DJ water resources. Thus, if no annual supply ceiling was specified in the supply agreement, the GD side considered that they would have difficulty in ensuring adequate water supply for Hong Kong in case of droughts.

8. Moreover, Hong Kong and GD are under the same climatic setting (rainfall pattern, temperature, etc.). When our local yield reduces during drought years, the quantity of DJ water available for distribution will also dwindle. In the event of drought, there will not be any guarantee that the GD side can meet our demand for a higher DJ water supply quantity unless we set a “reserved quantity”, equivalent to a higher supply ceiling, for possible need during drought years in the supply agreement. By so doing, such arrangement is effectively the same as the “package deal lump sum” approach.

9. In view of the above, we consider that the continuous adoption of the “package deal lump sum” approach for the New Agreement stipulating an annual supply ceiling would ensure a reliable and flexible supply of DJ water to meet the needs of Hong Kong.

10. Notwithstanding the above, we have succeeded in securing a mechanism in the New Agreement in which the annual water price will be adjusted downward from the fixed annual ceiling water price by deducting the difference between the annual supply ceiling and the actual amount of water supplied multiplied by a unit rate. This price deduction mechanism would address the public requests for payment based on quantity of DJ water imported. Given the efforts put in by both sides in arriving at the “package deal deductible sum” approach, both sides agreed that this approach should be maintained at least up to 2029 (assuming 3 three-year water supply agreements including the New Agreement).

(b) Water quantity

11. Whilst there has been a steady population and economic growth in Hong Kong, we have managed to contain the growth of our fresh water demand in the past few years, thereby containing the growth of demand for DJ water.

12. The Current Agreement has adopted an annual supply ceiling of 820 mcm. We have carried out a detailed analysis based on the latest fresh water demand forecast and estimated that the annual demand for DJ water in 2021 to 2023 inclusive with 99% reliability of water supply will not exceed 820 mcm. We therefore retained the current annual supply ceiling of 820 mcm in the New Agreement to maintain the reliability of water supply in Hong Kong.

(c) *Annual Ceiling Water Price*

13. The annual ceiling water price is adjusted based on the established mechanism, where factors to be considered include changes in the exchange rate between Renminbi (“RMB”) and HKD, changes in the relevant price indices of both sides, as well as increases in operation costs, etc.

14. The average annual rate of change in RMB/HKD exchange rate is about -0.95% in the past three years from 2017 to 2019, while the average annual rate of change of the relevant price indices of GD and Hong Kong is about +2.31% over the same period. After rounds of negotiations, both sides agreed the annual ceiling water prices from 2021 to 2023 in the New Agreement are HKD4,885.33 million, HKD4,950.51 million and HKD5,016.35 million respectively, an annual increase of 1.33%. We consider the increases in the annual ceiling water price reasonable.

(d) *Unit rate for calculating the downward adjustment for amount of water supply less than the annual supply ceiling*

15. Having considered the variable cost in supplying DJ water to Hong Kong, the Working Group agreed on the unit rate for 2021 to be HKD0.300/m³ (or HKD300,000 per mcm) and that the unit rate should be adjusted based on the same percentage change for the annual ceiling water price in the corresponding year. Thus, the unit rates for DJ water conserved for 2021 to 2023 in the New Agreement are HKD0.300/m³, HKD0.304/m³ and HKD0.308/m³ respectively.

(e) *Minimum and average quantities of DJ water imported*

16. With the adoption of the new water price deduction mechanism, to serve as a reasonable balance between addressing the fluctuation in water demand in Hong Kong and giving certainty on the scale of DJ water supply for GD’s stable operation, both sides agreed to adopt a minimum annual DJ water supply quantity of 615 mcm for the New Agreement, as well as an average annual DJ water supply quantity which should not be less than 700 mcm during the nine-year period covering the New Agreement and the subsequent agreements. These quantities are derived based on the actual minimum and

average annual supply quantities in the past 15 years since the adoption of the “package deal lump sum” approach⁶.

(f) *Estimated actual water price to be paid*

17. With the adoption of price deduction mechanism in the New Agreement, for illustration, the estimated actual water price to be paid by Hong Kong under three different import quantity scenarios covering the minimum water supply (615 mcm), the minimum nine-year average (700 mcm) and the supply ceiling (820 mcm) in the New Agreement are given as follows -

Year	Estimated Actual Water Price to be Paid under Different Import Quantity Scenarios (HKD million)		
	Scenario 1 Import of 615 mcm	Scenario 2 Import of 700 mcm	Scenario 3 Import of 820 mcm
2021	4,824.03	4,849.53	4,885.53
2022	4,888.19	4,914.03	4,950.51
2023	4,953.21	4,979.39	5,016.35

We estimate that, based on 2021 price level, the maximum saving with the adoption of price deduction mechanism within the nine-year period is HKD324 million.

(g) *Ultimate annual supply quantity*

18. It is stated in the Current Agreement that the ultimate annual supply quantity is 1 100 mcm. Both sides agreed to retain 1 100 mcm as the ultimate annual supply quantity in the New Agreement.

(h) *Water quality*

19. The GD side has agreed to maintain in the New Agreement the quality of DJ water supplied to Hong Kong in compliance with Type II water in the Environmental Quality Standards for Surface Water (GB3838-2002), which is the highest national standard for surface water applicable to the abstraction

⁶ The actual minimum and average annual DJ water supply quantity since adoption of the “package deal lump sum” approach from 2005 to 2019 inclusive were 612 mcm in 2013 and 702 mcm respectively.

for human consumption. According to our water quality monitoring data, the quality of DJ water supplied to Hong Kong has been able to meet this standard.

Special Arrangement for 2021 Actual Water Price

20. In view of the prevailing challenging economic environment arising from the COVID-19 epidemic, the GD side has agreed that the actual water price for 2021 (after the deduction for DJ water conserved) is to be frozen at the 2020 level (i.e. HKD4,821.41 million) to ease the financial burden of Hong Kong.

WAY FORWARD

21. We plan to enter into the New Agreement with the GD side by the end of 2020 before the expiry of the Current Agreement.

Development Bureau
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