

**Legislative Council Establishment Subcommittee**  
**Regrading of Assistant Director of Water Supplies posts**  
**in Water Supplies Department**

The Legislative Council Establishment Subcommittee discussed the proposed regrading of Assistant Director of Water Supplies posts in Water Supplies Department at the meeting on 19 June 2017. In this connection, Hon CHU Hoi-dick submitted a written question on 14 June 2017, requesting the Government to provide the following information:

- (1) Please advise the annual rate of increase in water consumption in the past 10 years. What are the reasons for the increase?
- (2) Please advise whether the Government has set “zero growth in water consumption” as the target for the city. If not, what are the reasons?
- (3) Flow controllers
  - (a) Please advise the annual water consumption of government buildings. Approximately how many water taps are there? What is the percentage of water taps installed with flow controllers?
  - (b) What is the annual water consumption of public bodies and statutory organisations? Approximately how many water taps are there? What is the percentage of water taps installed with flow controllers?
  - (c) What is the annual water consumption of the households in public rental housing? What is the percentage of households that have installed flow controllers? What is the percentage of households that have installed flow controllers for shower heads?
  - (d) What have the Government achieved by distributing and giving away flow controllers over the past 10 years? Please advise in brief.
- (4) Leakage

According to paragraph 4 of the Legislative Council Paper No. CB(1)791/16-17(01), “the Water Supplies Department (WSD) has been taking a multi-pronged approach to tackle the water main leakage problem, which includes the implementation of leakage detection, pressure management and Replacement and Rehabilitation (R&R) Programme for water mains. With the R&R Programme of about 3 000 km of water main substantially completed in 2015, the condition of the water distribution network has been largely improved. The leakage rate has been reduced from about 25% in 2001 to about 15% in 2016. It is worth noting that with

service reservoirs located at high altitude for water supply to premises at different levels, water mains at lower altitudes are operating under a relatively high water pressure, thereby the water distribution network is prone to leakage and the water main leaks are considered more as operational constraints rather than losses.”

- (a) Please advise the remaining length of aged water mains. Are there any on-going improvement works? If yes, what is the target?
- (b) How much fresh water is wasted at a leakage rate of 15%? What is the percentage of water mains that cannot be “rehabilitated” owing to geographical constraints? What is the percentage of water mains that are not affected by geographical constraints and can be rehabilitated?

(5) Dongjiang (DJ) Water

It is well known that the “package deal lump sum” approach adopted in purchasing DJ water has led to significant wastage of water resources and public money. Despite the possible difficulties in price negotiation, it is incumbent on the Government to resolve the water wastage problem. Please advise in detail the directions for short- and long-term improvement.

Our response to the five parts of Hon CHU Hoi-dick’s question is as follows:

- (1) In the past 10 years, the fresh water consumption in Hong Kong has increased at an average rate of about 0.25%. The increase was mainly driven by population growth (the average annual population growth rate is about 0.7%) and rise in visitor arrivals (the total number of visitor arrivals increased from 28 million in 2007 to 57 million in 2016). Another contributing factor is the reduction in average domestic household size (from about 3.0 in 2007 to 2.8 at present).
- (2) The Water Supplies Department (WSD) has been using a multi-pronged approach, including a series of publicity and educational activities, to promote water conservation to all sectors in the community with an aim to controlling the increase in water demand arising from population growth and rise in visitor arrivals.

Apart from distributing flow controllers to households participating in the “Let’s Save 10L Water” campaign, we have also installed flow controllers in public rental housing estates to help these households reduce water consumption. The target is to reduce the per capita daily fresh water consumption by 10 litres, from the current consumption level of around 130 litres to 120 litres. According to overseas experience, legislating for

mandatory use of water saving devices is the most effective measure for reducing water usage. Therefore, we are progressively converting the voluntary Water Efficiency Labelling Scheme (WELS) into a mandatory scheme. As the first stage, we have mandated the use of water efficient devices registered under the WELS in new developments and renovation of buildings since February 2017. For the subsequent stages, we plan to introduce legislative amendments to mandate the WELS labelling of designated water appliances offered for sale in Hong Kong.

Given that the increase in non-domestic water consumption is primarily driven by the rise in visitor arrivals, we have carried out water efficiency audits for hotel and catering industries of high water usage and compiled best practice guidelines for water usage (BPG) for them. The BPG was formally introduced, with the industries and the WSD pledging to work in concert to promote water conservation, in a ceremony held in the Water Conservation Week in November 2016. We will continue to promote BPG and encourage the hotel and catering industries to use water-saving devices to enhance water efficiency and reduce water consumption. We believe these measures can effectively control the rate of increase in overall water consumption.

- (3) Government buildings (including parks, swimming pools, sports centres, markets and schools), which have around 62 200 water taps and shower heads installed, consumed about 43 million cubic metres of fresh water in 2016. As at the end of May 2017, WSD has installed flow controllers for about 26 500 water taps and shower heads, accounting for about 43% of the total number of installations. The remaining 35 700 or so water taps and shower heads could not have flow controllers installed owing to incompatibilities in sizes, models or fittings. Amongst them, 6 800 water taps and shower heads have been retrofitted with water saving devices. Retrofitting work for the remaining 28 900 water taps and shower heads will be undertaken as and when appropriate (e.g. when the devices are due for replacement).

The offices of public or statutory organisations are mostly located in private commercial buildings. Generally, each commercial building has just one single water meter. There is no separate metering for individual units. As such, we cannot provide any information on the water consumption or water taps of public or statutory organisations.

The households in public rental housing (PRH) estates consumed approximately 90 million cubic metres of fresh water in 2016. Since August 2014, WSD has started to install flow controllers for PRH households. As at

the end of May 2017, flow controllers have been installed for 99 000 households, which accounts for about 12.5% of all PRH households. WSD will continue to liaise closely with the Housing Department and continue to carry out flow controller installation works in PRH estates.

Since the launch of “Let’s Save 10L Water” campaign in March 2014, WSD has been encouraging the public to make a pledge on using water wisely and saving 10 litres of water every day by signing the Commitment Certificate online. Households participating in the campaign are entitled to a pair of complimentary flow controllers for water taps to help them save water. As at the end of May 2017, WSD has distributed around 280 000 flow controllers to 140 000 or so participating households. Flow controllers are also distributed to successful applicants for e-bill service. As at the end of May 2017, around 90 000 flow controllers were distributed to over 45 000 households that opted for e-bill service. All in all, about 370 000 flow controllers were distributed.

- (4) The condition of the water distribution network has improved significantly with the substantial completion of the Replacement and Rehabilitation Programme of Water Mains (R&R Programme) at the end of 2015. The condition of water mains is affected by a variety of factors. Apart from the aging of water mains, other factors include water supply pressure, traffic loading on water mains, ground movement or subsidence caused by nearby road excavation works and external disturbance. WSD considers that it is now an opportune time to implement a Water Intelligent Network (WIN), which utilises advanced technologies to continuously monitor the water distribution network performance in a holistic manner. When implemented, WIN will help us determine the most cost-effective network management measures, including reprovisioning of aged water mains which are beyond economic repair, to maintain the health of the network.

Owing to the hilly terrain of Hong Kong, our water supply network needs to supply water to premises at different levels. Therefore, the water mains at lower altitudes have to operate under the relatively high water pressure required for supplying water to premises located at relatively high altitudes. The water supply pressure in Hong Kong is generally between 60-metre head and 80-metre head, which is higher than the approximately 40-metre head in Singapore and other places. Such high water pressure makes the water mains more prone to leakage. Hence, water main leakage should be regarded as an operational constraint instead of a loss. Indeed, the water main leakage rate of Hong Kong (about 15% in 2016) is moderate when compared with other developed cities, such as London (24.7% in 2014),

Taipei (15.6% in 2015) and Auckland (12.94% in 2015-16). Generally, more resources would be required to achieve lower leakage rates in water mains. In addition to making reference to the relevant overseas experience and the performance data of water mains network collected during the progressive implementation of WIN, we will also consider cost-effectiveness when setting the long-term target of water main leakage rate that is appropriate to the circumstances of Hong Kong.

Leaks may occur anywhere in the whole water supply network of the territory and may be attributed to the various factors mentioned above, including the water supply pressure which is subject to geographical constraints. Therefore, it is not possible to assess the proportion of water mains network that could not be rehabilitated due to geographical constraints. As mentioned above, we consider it an opportune time to progressively implement WIN at present for determining the most cost-effective network management measures, including reprovisioning of aged water mains. Such reprovisioning works can be implemented by replacement or rehabilitation of water mains. But rehabilitation works requires suspending the operation of the water mains concerned for a period of time. If such suspension entails serious consequences, the water mains concerned cannot be reprovisioned by way of rehabilitation.

- (5) The catchment areas in Hong Kong measure about 300 square kilometres. But their yield in the past 20 years, which ranged from a low of 103 million cubic metres in 2011 to a peak of 385 million cubic metres in 2016, fell far short of the annual fresh water demand of about 980 million cubic metres. Therefore, importation of DJ water helps make up the shortfall in local yield.

WSD has carried out detailed analyses on the basis of fresh water demand forecast. To ensure 99% reliability in water supply, the annual supply ceiling of DJ water has been set at 820 million cubic metres in the water supply agreement. In fact, the imported quantity of DJ water nearly reached the ceiling in 2011. Without the guaranteed supply under the water supply agreement, Hong Kong would not have sufficient fresh water supply in 2011 and might have to resort to water rationing, causing adverse impacts on our livelihood and economy.

Since 2006, we have adopted the “package deal lump sum” approach in the DJ water supply agreements, which guarantees an annual water supply up to the ceiling stipulated in the agreements. The actual quantity of DJ water imported can also be flexibly adjusted in accordance with our local yield. In other words, we have in effect purchased a water right from Guangdong

Province, which guarantees an adequate water supply for Hong Kong even under extreme drought condition with a return period of one in 100 years. But as in purchasing insurance for protection, the right may not be fully exercised in all instances. As such, there is no question of excessive payment for water. Notwithstanding this, we have been exploring with the Guangdong authorities the feasibility of adopting “payment on actual supply quantity” approach as proposed by some Councillors.

The Government is also pressing ahead with the development of local water resources that are not susceptible to the effects of climate change, including a medium-size desalination plant in Tseung Kwan O and supply of reclaimed water to north-eastern part of the New Territories for toilet flushing and other uses, with a view to enhancing the stability in water supply for Hong Kong in the long term.

**Development Bureau**

**Water Supplies Department**

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