

**For discussion on  
26 June 2018**

## **Legislative Council Panel on Development**

### **Automatic Meter Reading for Water Supplies in Hong Kong**

#### **PURPOSE**

This paper briefs Members on the plan of Water Supplies Department (“WSD”) to promote wider application of Automatic Meter Reading (“AMR”) for water supplies in Hong Kong.

#### **BACKGROUND**

##### AMR

2. AMR is a system to collect the water consumption data of individual customers automatically and remotely by means of smart water meters installed at their premises. It can manage and analyse the metering data for disseminating useful information to customers, providing output for billing as well as for operation and planning of water supplies.

3. The major components of AMR include AMR Master Station (i.e. the backend computer in WSD) and AMR Outstation (i.e. the equipment installed at individual buildings), as detailed in Enclosure 1.

4. Smart metering is one of the key features of a smart city and is developing fast globally. Utilities of overseas cities (e.g. Lisbon, London, New York, Sydney, etc.) including water utilities are deploying smart metering to improve metering efficiency as well as customer service. Smart water metering, i.e. AMR, offers greater visibility to the consumers for them to better understand and manage their water consumption. According to the latest predictions of some global leading research and consulting organisations, the market penetration of smart water meter in Europe will rise to 50% by 2020 and more than 50 000 000 smart water meters will be sold worldwide in the coming five years.

## Development of Smart City in Hong Kong

5. The 2017 Policy Address announced the Government's commitment to develop Hong Kong into a smart city by using innovation and technology to enhance city management and improve people's livelihood. In line with global trend, as well as to reaffirm the Government's commitment to building Hong Kong into a world class smart city, WSD plans to promote a wider application of AMR for water supplies in Hong Kong.

### Pilot Scheme on AMR

6. WSD embarked on a pilot scheme to evaluate the technical performance and data handling reliability of AMR in 2013. Under the scheme, around 350 smart water meters were installed in selected blocks of one government quarters and two public rental housing estates. In 2016, WSD enhanced the pilot AMR by disseminating water consumption information to related customers via a mobile app. The performance of the pilot AMR is satisfactory and it confirms the viability of a larger scale implementation of AMR in Hong Kong.

### Current Implementation of AMR in Hong Kong

7. In the Smart City Blueprint for Hong Kong published in December 2017, the Government has included requirements on the provision of smart water meter system in buildings, i.e. AMR, for new land sales sites in the Kai Tak Development ("KTD") in Kowloon East as one of the initiatives to develop a green and smart community. Besides, in conjunction with the development of a smart water supply model, AMR will also be implemented in the Development of Anderson Road Quarry Site ("ARQD") as one of the initiatives for the smart water supply model. In all, around 55 000 smart water meters will be installed progressively in these two new development areas starting from 2018-19.

8. Apart from KTD and ARQD, WSD is also collaborating with Architectural Services Department ("ArchSD") and Urban Renewal Authority ("URA") to implement AMR in their seven developments (one from ArchSD and six from URA). The number of smart water meters in these developments is about 1 300.

## PLAN FOR WIDER APPLICATION OF AMR

9. Promoting wider use of AMR helps develop Hong Kong into a smart city. It also aligns with international trend towards adopting innovative technologies in meter reading for smart water supply with the following benefits:-

- (a) Increase metering efficiency by automatic meter reading and accuracy by avoiding human error;
- (b) Encourage and facilitate consumers' development of a water-saving behaviour<sup>1</sup> by enhancing their awareness of their water consumption;
- (c) Enable detection of abnormal water consumption of individual customers which may be caused by leakage in their internal plumbing system and alert them for taking early rectification action;
- (d) Enable early and accurate assessment of the water loss situation by providing nearly real time water consumption data; and
- (e) Facilitate better planning and operation of water supply systems as more detailed water consumption data in particular the water consumption patterns will be available from AMR.

10. In view of the above, WSD plans to promote wider use of AMR in Hong Kong through the following arrangements:-

- (a) for all new private developments considered appropriate by WSD<sup>2</sup> that fall under the categories listed below, by incorporating necessary requirements in the relevant land documents for such private developments:-

---

<sup>1</sup> Experience in the United Kingdom indicates that around 3% of water consumption could be saved after implementation of smart water meters.

<sup>2</sup> While WSD intends to implement AMR in all new private developments such as residential, commercial, industrial, godown, hotel buildings etc., it does not intend to implement AMR in small buildings with one or a few water meters such as village houses where the cost for the AMR Outstation to be borne by the developer is disproportionately high as compared with the construction cost of the building.

- (i) developments disposed of under the Government's land sale programme;
  - (ii) developments by way of lease modification or land exchange (other than those minor modification cases); and
  - (iii) developments by way of private treaty grant (such as Mass Transit Railway cases).
- (b) for new private developments other than those covered in (a) above whose developers request WSD to implement AMR and undertake to comply with all the necessary requirements, through mutual agreement; and
- (c) for new public and government developments, by incorporating necessary requirement in their project scopes during planning and design stages.

11. The private developers, or the responsible parties for public and government developments, will be required to provide and install the AMR Outstations at their developments, conduct testing and commissioning, and hand over the AMR Outstations to WSD for future operation and maintenance.

12. For private developments, private developers will need to comply with the requirements as given in the paragraph above at their own cost. For public and government developments, the associated cost will be included in the relevant project estimate, and their funding approval would be sought under prevailing mechanisms.

13. It is estimated that private developers, or responsible parties for public and government developments, need to bear a cost of about \$800 per meter on average for providing the AMR Outstation, including the conduit system for the cabling network (but excluding the smart water meters which are to be provided by WSD). Furthermore, there is an additional cost to be borne by the Government at about \$700 per meter on average, which includes the procurement and installation of the smart water meters and the establishment of the AMR Master Station. Such cost however is considered

insignificant in general when compared with the overall cost of the developments.

14. Based on the Long Term Housing Strategy Annual Progress Report 2017, it is estimated that the number of housing units that will be installed with AMR in the ten-year period from 2018-19 to 2027-28 is about 460 000<sup>3</sup> units.

## **OTHER ISSUES**

### Implementation of AMR in Existing Buildings

15. For existing buildings, the cost and difficulty in retrofitting the conduit system for the cabling network of the AMR Outstation will be the major hurdle for implementation of AMR at present. Nevertheless, with continuous technological advancement in wireless technology, it is anticipated that reliable and affordable wireless/mobile solution can offer alternative to the current wired one in future obviating the need for the conduit system for cabling network and eventually make implementation of AMR in existing buildings viable and cost effective. WSD will keep abreast of the technological development and review the latest technology for data transmission within buildings. When the technology of wireless solution becomes mature, WSD will consider engaging a consultant to conduct a study to formulate the strategy for the implementation of AMR in existing buildings. By then, WSD will also review and update the requirements for conduit system and cabling work, and even the AMR Outstation as a whole.

---

<sup>3</sup> The customer accounts for non-housing developments such as commercial, government, institution and community buildings have not been included in the estimation as their number is insignificant when compared with that for housing developments.

## **ADVICE SOUGHT**

16. Members are invited to note the plan of WSD to promote wider application of AMR for water supplies in Hong Kong.

**Development Bureau  
June 2018**

## **Major Components of AMR**

The AMR comprises the following two major components:

(a) **AMR Master Station**

The AMR Master Station is a backend computer system in WSD for managing and analysing the metering data for disseminating water consumption information to customers and providing output for billing as well as for operation and planning of water supplies.

(b) **AMR Outstation**

The AMR Outstation is installed in the individual buildings. It comprises smart water meters of individual premises, AMR panel housing the Data Concentration Unit (“DCU”), power supply equipment, data communication and auxiliary equipment and a cabling network in the building. The smart water meters will collect the water consumption data of individual customers which will be sent through the cabling network to the DCU. The DCU will transmit the metering data via the communication equipment to the AMR Master Station in WSD through broadband/mobile network.