

## **Construction of water-supply pipes and sewers**

### **A. Construction of rainfall drainage system development**

By the end of 2014, 4,722 kilometers of the target length of 6,804 in the project of rainfall drainage system construction project in the urban development has completed. If the implementation rate is calculated with the ratio of actual implemented length occupied in the target length, the implementation rate for the rainfall drainage system construction in Taiwan reached 69.4% in 2014. In which, the highest rate is 96.7% in Taipei city, followed by 94.0% in Penghu County, 82.9% in New Taipei City, 77.4% in Yunlin County , 75.5% in Chiayi City and 73.2% in Nantou County. The ratio in all other counties and cities is less than 70%, needed to be improved in construction.

### **B. Sewage sewer construction**

Sewage sewers are sewers for family and industrial sewage. The whole sewage treatment rate includes public sewage sewer available rate, special sewage sewer available rate and the implementation rate of building sewage systems. Sewage sewer construction is regarded as an important index for the urban modernization. In World Competitiveness Yearbook reported by International Institute for Management Development , Lausanne (IMD) public sewage sewer available rate was listed in life quality as one of the evaluation items. The government also treats it as the performance index of sewage sewer construction.

#### **(1) Sewage treatment rate**

By the end of 2014, the number of sewage treatment units of the country was 4,093,494 and the sewage treatment rate was 69.87% which increases 3.25% in comparison with 66.62% in 2013. The unit number of public sewage sewer was 2,223,878 (37.96% available rate) which increases 2.82% in comparison with 35.14% in 2013; 850,558 units (14.52% available rate) of special sewage sewer (in the scale of 100 units / 500 people or more in the communities and industrial districts) which decreases 0.28% in comparison with 14.80% in 2013 and units with the implementation of building sewage systems are 1,019,058 (17.39% implementation rate) which increases 0.72% in comparison with 16.67% in 2013. In terms of the sewage treatment rate, Taipei City and New Taipei City are the highest (100.0%), followed by Hsinchu County (86.42%), Keelung City (83.86%),

Kaohsiung City (81.95), Lienchiang County (70.94%) and Hsinchu City (68.79%), Taoyuan County (61.74%); other counties and cities are not over 60%. As to the usage fee, some counties and cities have not finished the self-government ordinances in charges of sewage usage. In considering the low piping coverage of sewage, only Taipei City charges to the users. Taichung City, Kaohsiung City, Taoyuan County, Chiayi County, Pingtung County, Keelung City and Hsinchu City charge to the users in Industry Park, only. Other counties and cities do not charge for it. The usage fee in 2014 was 1,399,751,000 dollars which increased 8.23% compared with that in 2013 and the CMY was 1,158,890,000 tons, which increased 5.35% compared with that in 2013. In which, the CMY in New Taipei City (388,790,000 tones) is the highest, followed by Taipei City (350,150,000 tones) and Kaohsiung City (279,380,000 tones).

In recent years, the impact of declining birthrate and other environmental changes factors, which led to an annual decreasing of the average number of persons per household. By the end of 2014, nationwide, the average number of persons per household is only 2.80 persons, according to Interior Ministry data indicates. while "Public sewerage sewer available rate" and "sewage treatment rate" two indicators, formerly calculation of the average number of persons per household was "a household of 4 persons", while still using the "a household of 4 people" to estimate these two indicators have been unrealistic, about the "fifth sewerage sewer construction project (104--109 year)", have been approved by the Executive Yuan, on September 10, 2014, the project amend calculation of two indicators, which are "public sewerage sewer available rate" and "sewage treatment rate", originally set up to "households" as the statistical unit modified to "population." That is:  $(\text{Actual service population}) \div (\text{Total population}) = (\text{Actual service households} \times \text{The average number of persons per household}) \div (\text{Total population})$ , the above formula, using current national (the average number of persons per household) ,computing national "public sewerage sewer available rate " and "sewage treatment rate," this two indicators, using current the county (city) (the average number of persons per household) , computing the county (city) "public sewerage sewer available rate " and "sewage treatment rate," this two indicators. By the end of 2014, according to data calculated, former public sewerage sewer available rate was 37.96% , the sewage treatment rate was 69.87%, In the plan case " fifth sewerage sewer construction plan

(104--109 year)" after being approved, the aim of the plan is to modify the calculation method of the two indicators, public sewerage sewer available rate was 26.57 %, the sewage treatment rate was 48.91%, compared with the former method of calculation reduced by about 11.39 and 20.96 percentage points respectively.

In the plan case " fifth sewerage sewer construction plan (104--109 year)" after being approved, the aim of the plan is to modify the calculation method of the two indicators, in terms of the sewage treatment rate, Lienchiang County (89.56 %) is the highest , followed by Taipei City (79.61%), New Taipei City (71.16%), Hsinchu County (64.82%), and the remaining counties are less than 60.0%. County sewage treatment rate is relatively the old and new method of calculation, the only Lienchiang County increase 18.62 percentage point, the remaining counties are reduced, Keelung City (reduce 31.87 percentage point ) is the most.

## (2) Expense of sewage sewer construction

The sewage sewer is urban public construction. The construction period is long and the investment is large. Therefore, the government must invest more than 10 billions in it every year. The construction expense comes from the government and the folk. As for the part of the government, the expense will be processed from the public budget planned by central government and local government.

The total expense of sewage sewer construction was 13,001,080,000 dollars in 2014, indicating a decrease ratio of 13.0% and budget decrement of 1,942,249,000 dollars over the previous year (2013); the highest expense was 11,451,337,000 dollars (88.1%) of construction expense, followed by 703,687,000 dollars (5.4%) of planning design expense and 321,550,000 dollars (2.5%) of land expense . In terms of geological location, the expense of New Taipei City , 2,177,605,000 dollars, was the highest, and was followed by 1,948,579,000 dollars for Kaohsiung City, and 1,687,530,000 dollars for Taipei City.

## (3) Sewage sewer system management fee

The sewage sewer system management fee in 2014 was 2,907,566,000

dollars which increases 3.5% (97,774,000 dollars) in comparison with 2,809,792,000 dollars in previous year (2013); the highest expense was 1,074,725,000 dollars (37.0%) of The power rate fee. followed by 768,013,000 dollars (26.4%) for Personnel fee, and 175,1370,000 dollars of Maintain fee (6.0%). When compared with that of previous year (2013), the fee of Maintain has the biggest increase ratio of 43.9%, followed by 20.5%.of Medicines fee.

(4) Sewage sewer pipes and facilities

The planned length of sewage sewer pipe diameter 600mm or above was 1,416,174 meters till the end of 2014 and 942,687 meters had been constructed. The planned length of pipe diameter 300mm – 600mm was 3,764,807 meters and 2,463,503 meters had been constructed. The planned length of sewage sewer pipe diameter below 300mm was 4,784,631 meters and 4,731,036 meters had been constructed. In terms of sewage treatment facilities, the planned wastewater treatment plants was 231 till the end of 2014 and 82 had been constructed. The planned pumping stations were 272 and 188 had been constructed. The planned interceptor station were 128 and 110 stations had been constructed.