

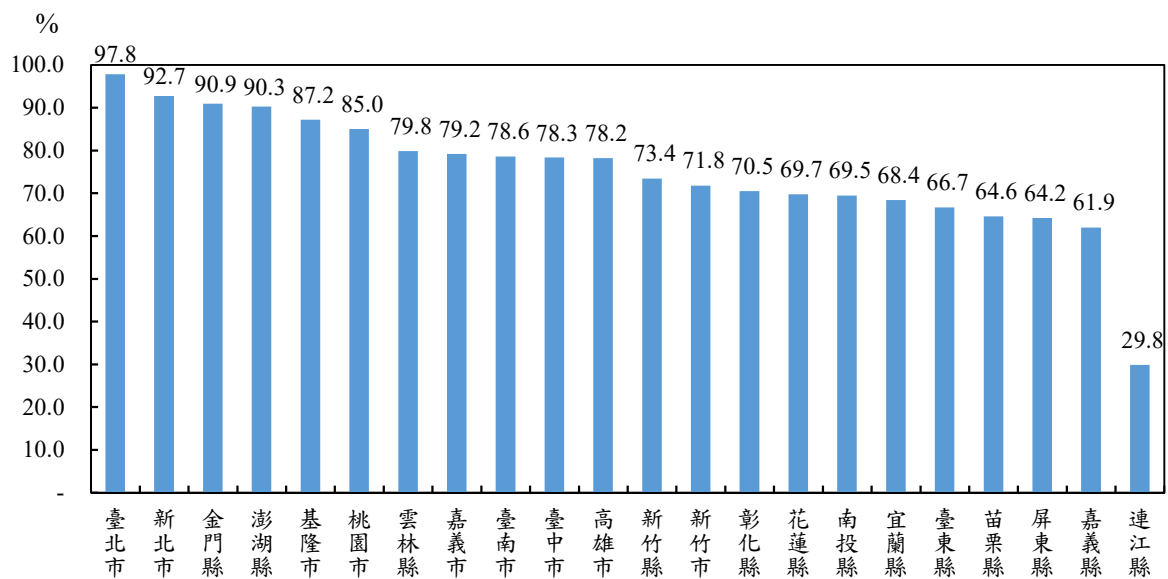
下水道系統之規劃與建設

一、雨水下水道建設

111 年底臺灣地區雨水下水道工程累計規劃幹線長度為 7,090 公里，已完成建設 5,658 公里。若以建設幹線總長度占規劃幹線總長度之比例計算實施率，111 年底臺灣地區雨水下水道建設實施率達 79.8%；其中臺北市實施率 97.8%、新北市實施率 92.7%、金門縣實施率 90.9%、澎湖縣實施率 90.3%、基隆市實施率 87.2%、桃園市實施率 85.0%、雲林縣實施率 79.8%、嘉義市實施率 79.2%、臺南市實施率 78.6%、臺中市實施率 78.3%、高雄市實施率 78.2%、新竹縣實施率 73.4%、新竹市實施率 71.8%及彰化縣實施率 70.5%，其他縣市都低於七成，有待持續加強建設(詳圖 1 及附表 5-1)。

圖 1 雨水下水道建設實施率

民國 111 年底



二、污水下水道建設

污水下水道係指專供處理家庭污水及事業廢水之下水道，整體污水處理率包括公共污水下水道普及率、專用污水下水道普及率（指規模 100 戶或 500 人以上之社區、工業區）及建築物污水處理設施設置率。污水下水道建設被視為都市現代化程度之重要指標，瑞士洛桑管理學院全球國家競爭力評估報告(IMD)中，污水下水道普及率被列入生活品質評比項目之一，政府也將污水處理率列為污水下水道建設衡量績效指標。

（一）污水處理率

近年少子化等環境變遷因素影響，致每戶平均人口數（戶量）逐年減少。依內政部戶政司資料顯示 103 年底全國戶量僅為 2.80 人，原以戶量「每戶 4 人」推算「公共污水下水道用戶接管普及率」及「污水處理率」之計算基準已不符實際，有關「污水下水道第五期建設計畫(104-109 年度)」業於 103 年 9 月 10 日奉行政院核定，案內修正「公共污水下水道用戶接管普及率」及「污水處理率」二項指標之計算方式，原以「戶數」為統計單位修改為「人口數」。即： $\text{實際服務人口數} \div \text{總人口數} = (\text{實際服務戶數} \times \text{戶量}) \div \text{總人口數}$ ，其中全國部分以當期全國戶量計算，縣市部分以該縣市當期戶量計算。

111 年底，全國整體累積污水處理戶數為 623 萬 8,411 戶，污水處理率為 68.65%，較上（110）年底 66.93% 增加 1.72 個百分點；其中公共污水下水道用戶接管戶數為 374 萬 9,581 戶，普及率為 41.62%，較上年底 39.78% 增加 1.48 個百分點；專用污水下水道用戶接管戶數為 87 萬 9,653 戶，普及率為 9.68%，較上年底之 9.77% 減少 0.09 個百分點；建築物污水處理設施設置戶為 160 萬 9,177 戶，設置率為 17.71%，較上年底之 17.38% 增加 0.33 個百分點。就縣(市)別觀之，污水處理率以新北市最高(95.49%)，其次依序為臺北市(88.52%)、新竹縣(75.03%)、基隆市(73.77%)、臺中市(71.33%)、高雄市(70.57%)、桃園市(70.23%)、新竹市(67.94%)、連江縣(62.58%)、臺南市(62.07%)、宜蘭縣(57.66%)及苗栗縣(51.31%)，其餘縣市均未達 50.00%。污水處理量(CMY)為 18 億 1,777 萬噸，較上年增加 38.92%，以新北市 9 億 2,762 萬噸最高、臺北市 3 億 4,160 萬噸次之及高雄市 2 億 7,835 萬噸再次之(詳表 1、表 2、圖 2 及附表 5-2)。

表 1 污水下水道執行概況

年別	整體污水處理率(%)				污水處理量 (萬噸/年)
	合計	公共污水 下水道 普及率	專用污水 下水道 普及率	建築物 污水處理設施 設置率	
107 年底	58.10	33.72	10.47	13.91	80,441
108 年底	62.10	36.17	9.99	15.94	133,935
109 年底	64.48	37.92	9.79	16.76	131,749
110 年底	66.93	39.78	9.77	17.38	130,846
111 年底	68.65	41.26	9.68	17.71	181,777
111 年底較 110 年底 增減百分比(點)	1.72	1.48	-0.09	0.33	38.92

備註：

- 100-102 年之普及率及處理率計算方式係依據「污水下水道普及率相關參數及計算公式座談會」研商共識，分母之戶數係依戶政資料總人口除以假設每戶四人而得，其計算公式為：接管戶數(設置戶數)÷(年底人口數÷4)。
- 自 103 年起普及率及處理率計算方式係依據污水下水道第五期建設計畫修正以接管戶數乘以各縣市戶量除以各縣市總人口數而得，其計算公式為：實際服務人口數÷總人口數=(實際服務戶數×戶量)÷總人口數，其中全國部分以當期全國戶量計算，縣市部分以該縣市當期戶量計算。

圖 2 污水下水道處理率

民國 111 年底

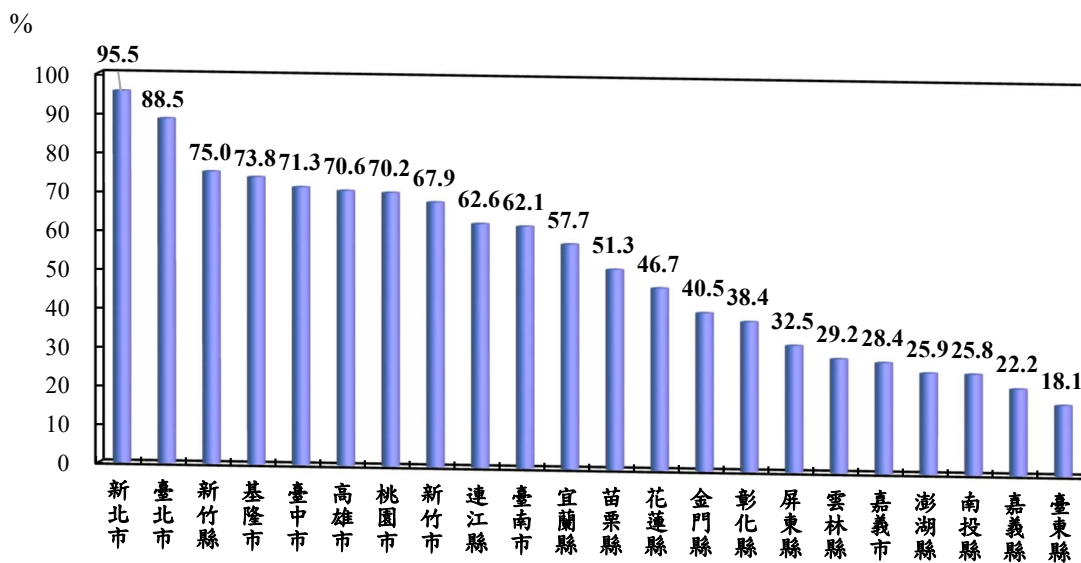


表 2 各縣市污水下水道執行概況
民國 111 年底

年別	整體污水處理率(%)				污水 處理量 (萬噸/年)
	合計	公共污水 下水道 普及率	專用污水 下水道 普及率	建築物 污水處理設施 設置率	
總 計	68.65	41.26	9.68	17.71	181,777
新北市	95.49	72.06	15.89	7.54	92,762
臺北市	88.52	87.28	0.33	0.90	34,160
桃園市	70.23	22.33	22.83	25.06	3,856
臺中市	71.33	25.60	11.88	33.84	5,732
臺南市	62.07	26.28	7.31	28.48	6,560
高雄市	70.57	49.01	5.54	16.02	27,835
臺灣省	43.47	225.69	93.61	274.29	10,515
宜蘭縣	57.66	35.46	5.88	16.32	1,942
新竹縣	75.03	25.38	19.23	30.42	1,131
苗栗縣	51.31	26.64	4.41	20.26	1,010
彰化縣	38.41	3.57	3.40	31.44	359
南投縣	25.77	7.22	1.90	16.64	200
雲林縣	29.22	5.10	2.00	22.12	455
嘉義縣	22.15	8.74	1.99	11.42	323
屏東縣	32.47	13.92	2.33	16.22	1,795
臺東縣	18.13	4.10	0.99	13.04	101
花蓮縣	46.72	38.21	1.29	7.21	1,617
澎湖縣	25.90	1.89	1.10	22.91	8
基隆市	73.77	41.47	25.98	6.32	543
新竹市	67.94	19.82	20.96	27.16	909
嘉義市	28.41	7.45	3.56	17.40	123
福建省	42.20	40.15	0.15	1.90	357
金門縣	40.52	38.45	0.01	2.06	337
連江縣	62.58	60.88	1.71	0.00	20

- 備 註：1. 自 103 年起普及率及處理率計算方式係依據污水下水道第五期建設計畫修正以接管戶數乘以各縣市戶量除以各縣市總人口數而得，其計算公式如下：

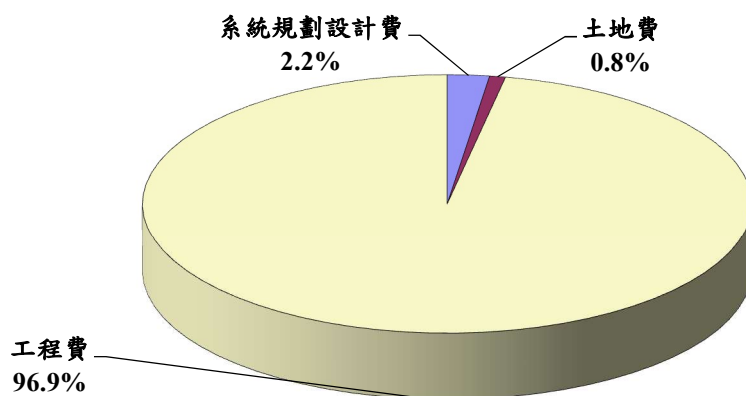
$$\text{實際服務人口數} \div \text{總人口數} = (\text{實際服務戶數} \times \text{戶量}) \div \text{總人口數}$$
其中全國部分以當期全國戶量計算，縣市部分以該縣市當期戶量計算。
2. 各縣市戶量係由內政部統計處網站(<http://www.moi.gov.tw/stat/index.aspx>)統計資料而得。

（二）污水下水道建設投入經費

公共污水下水道是都市公共建設，其建設期程長，且需投資龐大經費，展現效益慢，政府平均每年投入之經費超過百億元，而建設經費來源分為政府自辦及民間投資兩部分，政府自辦部分由中央及地方政府編列公務預算辦理。

111 年政府投入污水下水道建設經費共計 147 億 5,238 萬 5 千元，較上年增加 2,340 萬 3 千元，增幅為 0.2%，其中工程費 142 億 9,904 萬 2 千元(包含廠站工程 31 億 4,786 萬 9 千元及管線工程 111 億 5,117 萬 3 千元)，占 96.9% 最多，其次依序為系統規劃設計費 3 億 2,911 萬 5 千元，占 2.2%，土地費 1 億 2,422 萬 8 千元，占 0.8%；就縣市別觀之，以臺南市投入 30 億 6,678 萬 2 千元最高，新北市投入 22 億 9,443 萬 2 千元次高，高雄市投入 17 億 8,406 萬 9 千元再次之(詳圖 3 及附表 5-4)。

圖3 污水下水道建設投入經費百分比
民國111年



投入經費合計 147 億 5,238 萬 5 千元

（三）污水下水道系統營運管理費用及收入

111 年污水下水道系統之營運管理費用計 37 億 8,348 萬 7 千元，較上年增加 2 億 9,429 萬 7 千元，增幅為 8.4%，其中以電費 9 億 6,179 萬 2 千元占 25.4% 最多，人事費 8 億 9,268 萬 5 千元占 23.6% 次之，污泥清運處置費 4 億 9,281 萬 7 千元占 13.0% 再次之(詳表 3、圖 4 及附表 5-3)。

另就使用費收入觀之，由於還有部分縣市尚未完成下水道使用費徵收自治條例之訂定及考量污水下水道用戶接管普及率偏低，目前除台北市、高雄市、新北市、南投縣及連江縣全面開徵污水下水道使用費，臺中市、桃園市、宜蘭縣、嘉義縣、屏東縣、基隆市及新竹市僅針對事業用戶徵收使用費外，其餘縣市政府尚未徵收，111 年使用費收入計 31 億 7,558 萬 3 千元，較上年增加 61.2%。

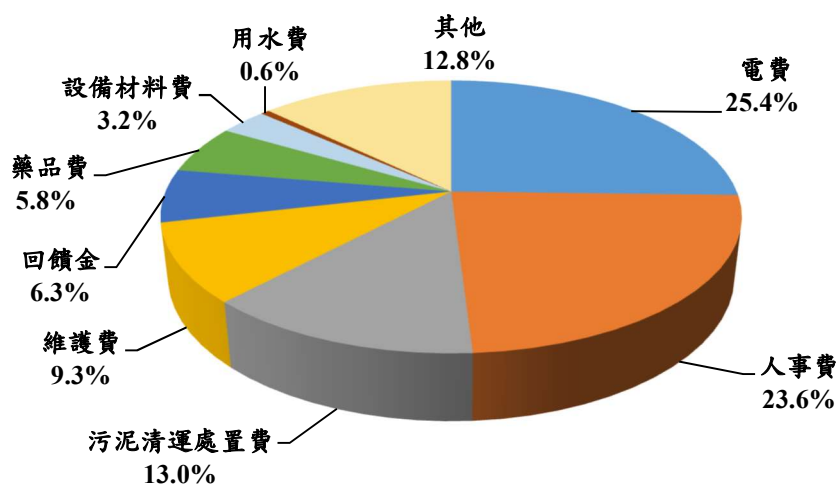
表 3 污水下水道系統營運管理費用及收入

單位：千元，%

年別	總計	人事費	電費	藥品費	設備材料費	維護費	回饋金	用水費	污泥清運處置費	其他	全年度使用費收入
107 年	3,273,165	730,163	885,723	111,886	81,105	238,656	189,724	1,035,908	1,727,433
108 年	3,335,948	884,004	840,643	136,746	108,575	236,627	192,731	936,622	1,820,086
109 年	3,150,071	732,307	814,507	218,667	112,249	293,093	233,940	17,651	365,030	362,627	1,917,959
110 年	3,489,190	800,092	836,773	214,501	103,690	357,369	225,285	20,080	531,114	400,286	1,969,971
111 年	3,783,487	892,685	961,792	217,705	119,480	352,802	238,484	21,646	492,817	486,076	3,175,583
111 年較 110 年增減(%)	8.4	11.6	14.9	1.5	15.2	-1.3	5.9	7.8	-7.2	21.4	61.2

圖 4 污水下水道系統營運管理費用百分比

民國 111 年



營運管理費用 34 億 8,919 萬元

(四) 污水下水道計畫管線及設施

就管線長度觀之，111 年底污水下水道管徑 600mm 以上之已建設長度為 129 萬 4,574 公尺，管徑 300mm-未滿 600mm 之已建設長度為 390 萬 7,179 公尺，管徑未滿 300mm 之已建設長度為 728 萬 3,343 公尺。污水處理設施方面，截至 111 年底污水處理廠已建設完成 116 座，抽水站已建設完成 295 座(詳表 4 及附表 5-5)。

表 4 污水下水道計畫已建設之管線長度及設施

年別	管線長度(公尺)			污水處理設施(座)	
	600mm 以上	300-600mm 未滿	300mm 未滿	處理廠	抽水站
107 年底	1,181,031	3,403,691	6,129,073	99	256
108 年底	1,221,843	3,603,312	6,438,231	103	271
109 年底	1,251,252	3,742,759	6,775,277	103	287
110 年底	1,277,408	3,822,757	7,024,197	113	294
111 年底	1,294,574	3,907,179	7,283,343	116	295

Planning construction of sewer system

A. Construction of rainfall drainage system development

By the end of 2022, 5,658 kilometers of the target length of 7,090 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 79.8% in 2022. In which, the highest rate is 97.8% in Taipei city, followed by 92.7% in New Taipei City, 90.9% in Kinmen County, 90.3% in Penghu County, 87.2% in Keelung City, 85.0% in Taoyuan City, 79.8% in Yunlin County, 79.2% in Chiayi City, 78.6% in Tainan City, 78.3% in Taichung City, 78.2% in Kaohsiung City, 73.4% in Hsinchu County, 71.8% in Hsinchu City and 70.5% in Changhua 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

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 2022, the number of sewage treatment households nationwide was 6,238,411, and the sewage treatment rate was 66.93% which increases 1.72% in comparison with 66.93% in 2021. The unit number of public sewage sewer was 3,749,581 (41.26% available rate) which increases 1.48% in comparison with 39.78% in 2021; 879,653 units (9.68% available rate) of special sewage sewer (in the scale of 100 units / 500 people or more in the communities and industrial districts) which decreases 0.09% in comparison with 9.77% in 2021 and units with the implementation of building sewage systems are 1,609,177 (17.71% implementation rate) which increases 0.33% in comparison with 17.38% in 2021. In terms of the sewage treatment rate, New Taipei City is the highest (95.49%), followed by Taipei City (88.52%), Hsinchu County (75.03%), Keelung City (73.77%), Taichung City (71.33%), Kaohsiung City (70.57%), Taoyuan City (70.23%), Hsinchu City (67.94%), Lienchiang County (62.58%), Tainan City (62.07%), Yilan County (57.66%) and Miaoli County (51.31%); other counties and cities are not over 50%. The CMY was 1,817,767,000 tons, which increased 38.92% compared with that in 2021. In which, the CMY in New Taipei City (927,619,074 tones) is the highest, followed by Taipei City (341,595,335 tones) and Kaohsiung City (278,347,023 tones).

(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 14,752,385,000 dollars in 2022, indicating an increase ratio of 0.2% and budget decrement of 23,403,000 dollars over the previous year (2021); the highest expense was 14,299,042,000 dollars (96.9%) of construction expense, followed by 329,115,000 dollars (2.2%) of planning design expense and 124,228,000 dollars (0.8%) of land expense. In terms of geological location, the expense of Tainan City 2,066,782,000 dollars, was the highest, and was followed by 2,294,432,000 dollars for New Taipei City, and 1,784,069,000 dollars for Kaohsiung City.

(3) Sewage sewer system management fee and income

The sewage sewer system management fee in 2022 was 3,783,487,000 dollars which increases 8.4% (294,297,000 dollars) in comparison with previous year (2021); the highest expense was 961,179,000 dollars (25.4%) of the power rate fee, followed by 892,685,000 dollars (23.6%) for Personnel fee, and 492,817,000 dollars of Sludge disposal fee (13.0%).

As to the usage fee, some counties and cities have not finished the self-government ordinances in charges of usage fee of sewage. In considering the low piping coverage of sewage, only Taipei City, Kaohsiung City, New Taipei City Nantou County and Lianjiang County charge to the users. Taichung City, Taoyuan City, Yilan County, Chiayi County, Pingtung County, Keelung City and Hsinchu City only charge usage fees for institutional users. Other counties and cities do not charge for it. The usage fee in 2022 was 3,175,583,000 dollars which increased 61.2% compared with that in 2021.

(4) Sewage sewer pipes and facilities

The constructed length of sewage sewer pipe diameter 600mm or above was 1,294,574 meters till the end of 2022. The constructed length of pipe diameter 300mm–600mm was 3,907,179 meters. The constructed length of sewage sewer pipe diameter below 300mm was 7,283,343 meters. In terms of sewage treatment facilities, the constructed wastewater treatment plants was 116 till the end of 2022. The constructed pumping stations were 295.