5 DEMAND FORECASTS

TasWater's forecast regulated revenue is a function of its water and sewerage demand forecasts and the maximum prices the Economic Regulator permits it to charge for its regulated services.

The Economic Regulator determines maximum prices by ensuring TasWater's forecast regulated revenue does not exceed its MARR, the latter being based on the build-up of TasWater's efficient costs.

The Economic Regulator required TasWater to use a demand forecast to estimate both its regulated revenue and future capex for each financial year of the third regulatory period.

To demonstrate the effectiveness of TasWater's current demand forecasting methods, the Economic Regulator's PSP Guideline required TasWater to include information for each financial year of the current regulatory period including:

- actual customer numbers;
- actual water demand;
- actual number of transactions subject to miscellaneous fees; and
- an explanation of the reasons for any variations between forecast and actual demand.

Due to the method used to calculate TasWater's prices, if forecast demand is higher than actual demand this results in lower prices for customers. Conversely, if TasWater's forecasts are lower than actual demand this results in higher prices for customers.

5.1 Water demand forecast

TasWater's proposed PSP presented forecast and actual water customer and water usage data for the 2015-16 financial year, which was the only year of the second regulatory period for which TasWater had actual data at the time of submitting the plan. Following TasWater's submission of its proposed PSP, the Economic Regulator requested that TasWater report actual data for the 2016-17 financial year as soon as it became available. TasWater provided this data to the Economic Regulator in September 2017. Table 5.1 contains a summary of the data from TasWater's proposed PSP and the data submitted in response to the Economic Regulator's request.

Table 5.1 Comparison of TasWater forecast and actual demand - 2015-16 and 2016-17 - Water

	2015-16		2016-17	
	Equivalent 20mm connections	Water use (ML)	Equivalent 20mm connections	Water use (ML)
Forecast	255 278	57 964	258 053	59 170
Actual	256 131	58 865	262 580	55 721
- *Standard connections*	*235 350*		*237 924*	
- *Fire service connections*	*20 781*		*24 656*	
Difference	853	901	4 527	-3 449
Difference (%)	0.3	1.6	1.8	-5.8

In its PSP for the second regulatory period, TasWater did not separately forecast equivalent 20mm connections and equivalent 20mm fire service connections. As shown in Table 5.1, the combined actual demand for these two services was only slightly higher (0.3 per cent) than TasWater's original equivalent 20mm connections forecast for 2015-16.

Table 5.1 also shows that in the data provided for 2016-17, actual demand proved to be 1.8 per cent higher than TasWater's updated forecast. The Economic Regulator notes that in its PSP for the second regulatory period, TasWater originally forecast equivalent 20mm connections demand of 256 044 in 2016-17. Comparing actual 2016-17 demand with TasWater's original forecast demand shows the actual demand to be 2.6 per cent higher than originally forecast.

TasWater reported in its proposed PSP for the third regulatory period that it had refined both its actual data and its demand forecasting method since forecasting demand for the second regulatory period. TasWater therefore considers that its demand forecasts for the third regulatory period are more robust than for the second regulatory period. Judging by the updated forecast and actual demand figures that TasWater submitted for 2016-17, the Economic Regulator is satisfied that TasWater appears to have improved its demand forecasting methodology.

TasWater noted that actual water use in 2015-16 was 1.6 per cent higher than originally forecast. TasWater attributed this to 2015-16 being a hotter than average year in Tasmania[14], leading to higher than average outdoor water use. Conversely, actual water use in 2016-17 was 5.8 per cent lower than TasWater's updated forecast. Compared against the original forecast in TasWater's PSP for the second regulatory period, actual demand was still 4.2 per cent lower than forecast. TasWater attributed this outcome to the May to December period of 2016 being significantly wetter than average for Tasmania[15], leading to lower than average outdoor water use.

For the third regulatory period, TasWater has forecast the number of equivalent 20mm connections, equivalent 20mm fire service connections and water use, as shown in Table 5.2. The forecast number of equivalent 20mm fire service connections presented in TasWater's proposed PSP is based on the actual number of equivalent 20mm fire service connections in 2015-16 (20 781). The Economic Regulator notes that the actual number of equivalent 20mm fire service connections subsequently reported by TasWater in 2016-17 (24 656) was considerably higher than any of its forecasts. This large increase in the number of equivalent 20mm fire service connections follows even larger increases in the preceding two years.

It appears that TasWater is still in a 'discovery phase' regarding fire service connections, ie the large growth in the number of equivalent 20mm fire service connections seen in previous years is due to TasWater discovering existing fire service connections on its network that it was not previously aware of, rather than new fire service connections being added to the network. Once TasWater is able to confirm the number of existing fire service connections on its network, the Economic Regulator expects that the growth rates in the number of equivalent 20mm fire service connections will return to those that TasWater has used to arrive at its demand forecasts.

Given the current uncertainty around the number of fire service connections on TasWater's network, and the fact that the forecast number of equivalent 20mm fire service connections has an immaterial impact on TasWater's revenue and pricing for the third regulatory period, the Economic Regulator has not required TasWater to revise its demand forecasts for equivalent 20mm fire service connections based on the actual figures from 2016-17. In future pricing investigations, the Economic Regulator will

14 The Australian Bureau of Meteorology reports that in 2016 the mean temperature in Tasmania was 0.88°C above average, which is a record for the state.

15 The Australian Bureau of Meteorology reports that the eight months from May 2016 to December 2016 was the wettest eight-month period on record for Tasmania.

seek further assurance from TasWater that it is continually refining its demand forecasting method to provide greater certainty around its fire service demand forecast figures.

Table 5.2 TasWater demand forecast summary for third regulatory period - Water

Financial year	2018-19	2019-20	2020-21
Equivalent 20mm connections (number)	240 709	242 471	244 235
Equivalent 20mm connections (% increase)	0.74	0.73	0.73
Equivalent 20mm fire service connections (number)	21 130	21 244	21 360
Equivalent 20mm fire service connections (% increase)	0.55	0.54	0.54
Water use (kilolitres)	59 761 540	60 051 223	60 339 237
Water use (% increase)	0.50	0.48	0.48

TasWater submitted the model it used to arrive at these forecast numbers for the Economic Regulator's review. As the basis for its demand forecasts, TasWater has used population growth estimates from the Department of Treasury and Finance's *2014 Population projections for Tasmania and its Local Government Areas.* Other variables that TasWater has used to develop its water demand forecasts include:

- estimates of the number of persons per household in Tasmania produced by the Australian Bureau of Statistics in its *Household and Family Projections, Australia, 2006 to 2031*;
- an assumed ratio of infill to greenfield development (32.5 per cent) based on current and future desired ratios published by the Southern Tasmanian Regional Councils Association in its *Southern Tasmania Regional Land Use Strategy 2010-2035*; and
- an assumed percentage of the number of total new developments occurring on infill lots with existing water and/or sewerage services (6.5 per cent) based on TasWater's own approved development applications data.

Having reviewed TasWater's demand forecast model, considered the relevant assumptions and checked the figures informing the forecasts, the Economic Regulator is satisfied that TasWater's water demand forecasts for the third regulatory period are reasonable, based on realistic assumptions and consistent with observed trends. The Economic Regulator also notes significant improvements in TasWater's demand forecasting method and rationale since the second regulatory period, and is satisfied that this has resulted in forecasts for the third regulatory period that appear to be reasonable.

5.2 Sewerage demand forecast

TasWater's proposed PSP provided forecast and actual sewerage customer data for the 2015-16 financial year. TasWater separately submitted actual sewerage customer data for the 2016-17 financial year. Table 5.3 contains a summary of this data.

As shown in Table 5.3, actual wastewater ETs in 2015-16 were somewhat lower than forecast by TasWater in its PSP for the second regulatory period. Similarly, actual demand for wastewater ETs in 2016-17 was 2.2 per cent lower than TasWater's original forecast. TasWater's updated demand forecast for 2016-17 was much closer to actual demand, resulting in a difference of only 0.4 per cent. TasWater explained the discrepancies with its original forecasts as being partly due to the way it previously calculated ETs based on customer billing codes. TasWater reported that it has reviewed its

calculation of ETs as part of ongoing business improvements, and expects that, as a result, its sewerage demand forecasts for the third regulatory period will be more accurate than for the second regulatory period.

Table 5.3 Comparison of TasWater forecast and actual demand - 2015-16 and 2016-17 - Sewerage (ETs)

	2015-16	2016-17
Forecast	238 967	233 545
Actual	231 848	234 456
Difference	-7 119	911
Difference (%)	-3.0	0.4

TasWater's forecast of the number of wastewater ETs during the third regulatory period is shown in Table 5.4.

Table 5.4 TasWater demand forecast summary for third regulatory period - Sewerage

	2018-19	2019-20	2020-21
Wastewater ETs (number)	236 893	238 556	240 225
Wastewater ETs (% increase)	0.71	0.70	0.70

The Economic Regulator notes that TasWater has changed the way it calculates the number of wastewater ETs, as it indicated it would do following the 2015 price determination investigation. Consequently, TasWater's sewerage demand forecasts for the third regulatory period are lower than for the second regulatory period, and appear reasonable to the Economic Regulator.

TasWater's demand forecast model for the third regulatory period used the same inputs, assumptions and variables to calculate the forecast demand for wastewater ETs as those used to calculate the forecast demand for equivalent 20mm water connections. The Economic Regulator is satisfied that TasWater's sewerage demand forecasts for the third regulatory period are reasonable, being based on realistic assumptions and consistent with observed trends.

5.3 Forecast of the number of miscellaneous transactions

TasWater's proposed PSP also contained forecast and actual miscellaneous services data for the 2015-16 financial year. The miscellaneous services referred to by TasWater included special meter reads, structures over works consents, service locations, property information plans, pressure and flow tests, and land information certificate requests. TasWater provided the Economic Regulator with some forecast and actual miscellaneous services data for 2016-17, explaining that it records its miscellaneous services transactions in various locations and the data is therefore hard to collate. The 2016-17 data that TasWater reported refers only to the miscellaneous services for which TasWater was able to confirm transaction numbers.

Table 75 and Appendix 15 in TasWater's proposed PSP provide a full list of the miscellaneous services it charges customers for, while Table 5.5 below summarises the forecasts of the number of these transactions. Readers should be aware that the figures for 2016-17 shown in Table 5.5 are incomplete, as they refer only to the miscellaneous services data that TasWater was able to collate.

With regard to forecast and actual miscellaneous services, TasWater notes that while the demand for each type of miscellaneous service tends to be relatively low it can vary widely from year to year.

The Economic Regulator acknowledges this point, and therefore does not believe it is appropriate to make any assessment of TasWater's miscellaneous services forecasts.

TasWater's proposed PSP acknowledged the large difference between forecast and actual miscellaneous services transactions for 2015-16. By way of explanation, TasWater pointed out that the regional water entities did not levy a number of the miscellaneous services charges currently levied by TasWater. Therefore, TasWater's forecast for the second regulatory period was based on fewer miscellaneous services than currently exist. TasWater has improved its reporting methods to correct this issue in forecasting demand for miscellaneous services for the third regulatory period.

Table 5.5 Comparison of TasWater forecast and actual demand - 2015-16 and 2016-17 - Miscellaneous services

	2015-16	2016-17 [Note]
Forecast	13 090	9 206
Actual	19 902	16 006
Difference	6 812	6 800
Difference (%)	52.0	73.9

Note: 2016-17 data is incomplete as it refers only to the miscellaneous services data that TasWater was able to collate.

In reviewing TasWater's demand forecast model, the Economic Regulator found that TasWater had miscalculated the actual number of miscellaneous services transactions for 2015-16, and had carried the error over into the forecast miscellaneous services transactions figures in its proposed PSP. The Economic Regulator notified TasWater of this issue, and TasWater subsequently provided the Economic Regulator with the updated demand forecast figures that are shown in Table 5.6.

Table 5.6 shows TasWater's demand forecasts for miscellaneous services transactions during the third regulatory period. In these forecasts, TasWater has removed service locations and property information plans from its calculations and added account establishments and closures. TasWater reported that these particular miscellaneous services are the most materially important in terms of overall numbers of transactions and the revenue that those transactions provide.

Table 5.6 TasWater demand forecast summary for third regulatory period - miscellaneous services transactions

	2018-19	2019-20	2020-21
Miscellaneous services transactions (number)	36 665	36 767	36 867
Miscellaneous services transactions (% increase)	0.28	0.28	0.27

The Economic Regulator notes that TasWater's forecast demand for miscellaneous services transactions in the third regulatory period is much higher than its forecast for the second regulatory period. This is due to TasWater increasing the number of miscellaneous services it may charge its customers for. The Economic Regulator also observes that TasWater has improved its approach to, and the accuracy of its method of, forecasting demand for miscellaneous services transactions for the third regulatory period, addressing the shortcomings in its forecasting methods identified during the second regulatory period.

TasWater's forecast demand for miscellaneous services in the third regulatory period, based on past actual demand figures and the demand forecasts for other relevant services, satisfies the Economic Regulator's expectations that TasWater's miscellaneous services demand forecasts for the third regulatory period be reasonable, based on realistic assumptions and consistent with observed trends.

5.4 Economic Regulator's Draft Report proposals

Having reviewed TasWater's demand forecast model for the third regulatory period, the Economic Regulator considered, in its Draft Report, that the model was sound. The Economic Regulator also considered that TasWater had fulfilled the demand forecasting requirements outlined in the PSP Guideline. The Economic Regulator therefore accepted TasWater's demand forecast figures as appropriate, and did not require TasWater to alter the demand forecasts in its proposed PSP.

5.5 Issues raised during consultation on the Economic Regulator's Draft Report

During review and analysis of TasWater's revised pricing model for the third regulatory period, which it submitted in response to the Economic Regulator's Draft Report, the Economic Regulator discovered that the demand forecast figures in the pricing model did not match the figures from TasWater's demand forecast model. Further investigation by the Economic Regulator also revealed discrepancies between figures in TasWater's pricing model, demand forecast model and annual regulatory financial statements.

The Economic Regulator subsequently asked TasWater to confirm which demand forecast figures were correct and, therefore, which forecasts should be used in the pricing model for the third regulatory period. TasWater responded that the figures from its demand forecast model were correct, while the figures in its pricing model and regulatory financial statements contained a calculation error. The Economic Regulator understands that this error stems from the way TasWater's Gentrack system treats multi-unit properties, in that it counts each unit as an individual connection rather than recognising that all units share a single connection.[16] The demand forecast figures in TasWater's pricing model and regulatory financial statements were therefore considerably higher than the figures in the demand forecast model.

5.6 Economic Regulator's decision

In view of TasWater's explanation and assurances that the figures in its demand forecast model are correct, the Economic Regulator accepts that TasWater has fulfilled the demand forecasting requirements outlined in the Economic Regulator's PSP Guideline.

The Economic Regulator accepts that TasWater has fulfilled the demand forecasting requirements outlined in the Economic Regulator's Water and Sewerage Price and Service Plan Guideline.

16 The Economic Regulator understands that data from TasWater's Gentrack system was used in preparing TasWater's regulatory financial statements and in developing TasWater's pricing model.