IPART Independent Pricing and Regulatory Tribunal | NSW

Review of Central Coast Council water prices – Demand for water services

Technical Paper

May 2022

Water »

Tribunal Members

The Tribunal members for this review are:

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The Independent Pricing and Regulatory Tribunal (IPART)

Further information on IPART can be obtained from IPART's website.

Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders, past, present and emerging.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

Contents

1 We set prices using CCC Water's demand forecasts

IPART sets the maximum prices Central Coast Council can charge its customers for the water, wastewater and other services provided by it as a Water Supply Authority.

IPART also sets the maximum percentage by which Central Coast Council may increase its general income each year through the local government rate peg or special variations.

To ensure it is clear which of Central Coast Council's responsibilities IPART is referring to, throughout this report:

- we refer to the Central Coast Council's functions as a Water Supply Authority under the *Water Management Act 2000* as '**CCC Water**'
- we refer to the Central Coast Council's local government functions under the *Local Government Act 1993* as '**the council**'.

Further information is available in our *Technical Paper – Regulatory background*.

We have reviewed CCC Water's prices for its water-related services, considered all community feedback to our review and have made our final decisions on the maximum prices CCC Water can charge for the 4 years from 1 July 2022 to 30 June 2026.[a] Our review only considers prices and costs related to CCC Water. It does not consider those related to the council's general activities for which it charges local government rates and levies and other charges.[b]

We consider our prices will allow CCC Water to deliver good quality water and improve services to the community – now and in the future. This Technical Paper focuses on demand for water services.

In setting prices for CCC Water, we aimed to ensure it will earn the level of revenue it requires to provide water, wastewater and other services that meet its customers' expectations.

Understanding past and future water needs on the Central Coast is important for setting water prices. We considered these in setting CCC Water's efficient costs[c] and the level of revenue[d] it needs to earn from each of its water, wastewater and other services over the 2022 determination period. We also calculated how much it needs to earn from each customer or property that will receive the service, and for each unit of water they will use and unit of wastewater they will discharge over this period.

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a As part of our review we must consider certain matters under the *IPART Act 1992 (NSW)* – detailed information is available in our *Technical Paper – Regulatory background.*

b IPART can also review increases to the council's income from rates, but this is a separate review through the special variation process.

c See our *Information Paper – Operating and capital costs*.

d See our *Technical Paper – How we set the revenue level*.

We set prices using forecasts of:

- the number of household and business customers we expect will receive water, wastewater and stormwater services in each of the 4 years of the 2022 determination period (forecast customer numbers)
- the volume of water we expect CCC Water will provide to household and business customers in each of those years (forecast water demand)
- the volume of wastewater we expect household and business customers will discharge in each of those years (discharge allowances and discharge factors).

It is important that these forecasts are reasonable. If CCC Water's actual water sales, customer numbers and discharge volumes differ markedly from our forecasts over the 2022 determination period, the determined prices might result in CCC Water significantly over or under-recovering its required revenue.

Because forecasting is not an exact science, we also considered how to manage the risk that actual customer numbers and water demand over the 2022 determination period may be materially higher or lower than the forecasts we used to set prices.

For this review, we considered several issues related to the demand for CCC Water's services, including:

- lower forecast yearly water sales over the 2022 determination period
- changes to billable discharge volumes from aligning wastewater prices for customers across the former Gosford and Wyong local government areas (LGAs)
- lower than forecast actual water sales during the 2019 determination period leading to a loss of CCC Water sales, and whether to compensate for this by applying a demand volatility adjustment mechanism (DVAM) for the 2022 determination period
- whether to set a drought price
- the impacts of climate change on water demand on the Central Coast and on CCC Water's business in the future.

We consider climate change is likely to have impacts on both water demand and water supply in the future. For example, higher temperatures are likely to increase peak water demand which may impact infrastructure capacity needs and therefore CCC Water's costs. CCC Water has also investigated how changes in rainfall may impact water supply by changing how much water flows in its rivers and into its dams. This may also impact the long-term marginal cost of water if investments are to be brought forward. We discuss this analysis in the sections below.

In response to our Draft Report, CCC Water supported our draft decisions on the demand for water services.[1] One stakeholder indicated support for a drought price[2], and a few stakeholders made comments about population growth and who should pay for the cost of new development.[3] A couple of stakeholders also raised concerns that costs may potentially be brought forward as a result of dealing with climate change.[e,4]

[e] We address these comments in section 2.1.1. about how our prices do not fund new developments and section 5.1.1. about how our decisions do not include the explicit costs associated with climate change or a desalination project.

This Technical Paper explains our final decisions to:

- accept CCC Water's forecast customer numbers and water demand, with average sales of 27,530 megalitres (ML) per year
- adopt slightly different chargeable wastewater volumes to what CCC Water proposed
- apply a DVAM of $2.1 million to compensate CCC Water for a loss in water sales across the 2019 determination period
- consider applying a DVAM as part of our next review of CCC Water's prices to manage the risk that actual demand over the 2022 determination period is materially higher or lower than the forecasts we used in setting prices
- not set a drought price for the 2022 Determination. We will consider whether to set a drought price when we next review CCC Water prices in its next determination
- recommend CCC Water improves its water demand forecasts by incorporating the impacts of climate change in its next pricing proposal
- recommend CCC Water consider and incorporate climate change risk and risk management of its investment and management of assets and infrastructure, in its next pricing proposal.

2 We accept CCC Water's proposed demand forecasts

In making our decisions, we reviewed CCC Water's proposed forecasts on customer numbers, water demand and wastewater billable discharge volumes and discharge factors. We decided to accept these proposals, and largely used them to set our final prices. However, we adjusted the proposed wastewater billable discharge volumes for non-residential customers to reflect CCC Water's proposed discharge factors for these customers.

Our decisions are:

23. To set water, wastewater and stormwater prices using the forecast customer numbers in Table 2.1, Table 2.2 and Table 2.3, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal.

24. To set water prices using the water sales forecasts in Table 2.5, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal.

25. For setting developer charges, to maintain the equivalent tenement value per customer at 150 kilolitres (kL).

26. For setting wastewater prices, to maintain the wastewater deemed discharge allowance for:
    - standalone residential properties at 125 kilolitres (kL)
    - multiple and mixed multiple premises at 80 kL
    - non-residential properties within mixed multiple premises at 125 kL.

27. For setting wastewater prices, to maintain the 75% discharge factor for all residential properties and unmetered properties.

28. To set wastewater prices for non-residential customers using the discharge factors and resulting billable discharge volumes in Table 2.6, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal to align wastewater charges for customers in the former Gosford local government area with those in the former Wyong local government area.

2.1 We used CCC Water's forecast of 1% yearly customer growth

CCC Water's forecasts of customer numbers are based on its best estimate of growth over the 2022 determination period and has been informed by recent changes in demographics, development, ABS Census data, mapping of CCC Water's water network, and recommendations made by its consultants, '.id (informed decisions)'.

CCC Water's forecast service population growth is about 1.0% each year compared to its forecast of 1.1% each year in the 2019 price review.[5] CCC Water forecasts about a 1.1% increase each year in the number of water and wastewater customers and a 0.5% increase to stormwater customers each year over the 2022 determination period.

After reviewing these forecasts, we consider them reasonable given changes in immigration due to the COVID-19 pandemic. Therefore, we have accepted CCC Water's customer numbers for the purposes of setting prices. Our decisions on the forecast number of water, wastewater and stormwater customers are set out in Table 2.1, Table 2.2 and Table 2.3.

In its submission to IPART, CCC Water supported our draft decisions on forecast customer numbers.[6] In response to our Draft Report, a few stakeholders made comments about population growth and that the cost of new housing developments should not be borne by CCC Water customers.[7]

2.1.1 New developments are not funded by prices we set for CCC Water

New water-related infrastructure required as a result of population growth is typically funded by developer contributions, rather than the periodic prices we set for CCC Water. Developer contributions are upfront charges that water utilities levy on developers to recover part of the infrastructure costs of providing water, wastewater and/or stormwater infrastructure to new developments. They aim to ensure existing customers do not face higher costs as a result of new development, signal the different costs of providing services to different locations, and enhance the potential for competition in the provision of water and wastewater services to new developments.

In setting prices for CCC Water, we considered the cost of providing water over the next 4 years (the determination period) which includes how much water we expect CCC Water to provide over the period. We considered by how much the demand for water services would increase and this is driven by growth in customer numbers in the Central Coast and changes in water use.

Under our approach to setting prices, higher customer numbers reduce CCC Water's prices through lower service charges, as costs are spread across more customers. This is because a large proportion of CCC Water's costs are fixed and do not vary with increases in the number of customers. Our prices take into account both current and future water use over the next 4 years of the 2022 determination period. Current residents and future residents will be subject to the same service and usage charges during the 2022 determination period.

Our approach ensures that costs are paid by the customers that benefit. This is because the cost of capital works is recovered over the expected life of the asset. This can range from 5 years (for some information technology), to over 100 years for some assets. Under our approach, current prices are also covering the costs of existing assets. In future, as the population increases, the costs will also be divided among more users.

Table 2.1 IPART decision on forecast number of water customers

	Current	IPART decision			
Category	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**
Residential	**105,101**	**106,242**	**107,383**	**108,548**	**109,715**
Residential mixed multiple premises	1,280	1,294	1,308	1,322	1,337
Residential multiple premises	29,531	29,851	30,172	30,499	30,827
Residential unmetered	37	38	38	39	39
Total residential	**135,949**	**137,425**	**138,901**	**140,408**	**141,918**
Non-residential	3,801	3,825	3,850	3,875	3,900
Non-residential (exempt)	1,401	1,410	1,419	1,428	1,437
Retirement village	56	56	56	56	56
Retirement village (exempt)	20	20	20	20	20
Non-residential mixed multiple premises	260	260	260	260	260
Non-residential unmetered	6	6	6	6	6
Total non-residential	**5,544**	**5,577**	**5,611**	**5,645**	**5,679**
Total	**141,493**	**143,002**	**144,512**	**146,053**	**147,597**

Note. This table presents total water connections. Non-residential and retirement village figures reflect the number of meters, not dwellings.
Source: CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for services*, September 2021, pp 20-23; CCC Water, 2019-20 Annual Information Return (AIR), September 2021 and IPART analysis.

Table 2.2 IPART decision on forecast number of wastewater customers

Category	Current 2021-22	IPART decision 2022-23	2023-24	2024-25	2025-26
Residential	**102,789**	**103,904**	**105,020**	**106,160**	**107,301**
Residential mixed multiple premises	1,252	1,266	1,279	1,293	1,307
Residential multiple premises	28,881	29,195	29,508	29,828	30,149
Residential unmetered	37	37	37	38	38
Total residential	**132,959**	**134,402**	**135,844**	**137,319**	**138,795**
Non-residential	3,642	3,665	3,688	3,713	3,736
Non-residential (exempt)	1,053	1,060	1,067	1,074	1,081
Retirement village	56	56	56	56	56
Retirement village (exempt)	20	20	20	20	20
Non-residential mixed multiple premises	256	256	256	256	256
Non-residential unmetered	5	5	5	5	5
Total non-residential	**5,032**	**5,062**	**5,092**	**5,124**	**5,154**
Total	**137,991**	**139,464**	**140,936**	**142,443**	**143,949**

Note. This table presents total wastewater connections. Non-Residential exempt and retirement village exempt are not charged a wastewater service charge.
Source: CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for services*, September 2021, pp 20, 24, 27-28. CCC Water, 2019-20 AIR, September 2021 and IPART analysis.

Table 2.3 IPART decision on forecast number of stormwater drainage customers

Category	Current 2021-22	IPART decision 2022-23	2023-24	2024-25	2025-26
Residential customers					
Standalone premise	107,667	107,895	108,123	108,356	108,589
Mixed multiple premises	1,445	1,619	1,793	1,970	2,148
Multiple premises	29,569	29,980	30,391	30,811	31,232
Vacant land	1,690	1,575	1,460	1,343	1,226
Total residential customers	**140,371**	**141,069**	**141,767**	**142,480**	**143,195**
Non-residential customers					
Mixed multiple premises	332	371	410	449	488
Vacant land	150	141	132	123	114
Low impact	22	22	22	22	22
Small property (≤1,000 m^2)	1,421	1,436	1,451	1,466	1,481
Medium property (1,001 m^2 to 10,000 m^2)	1,717	1,727	1,737	1,747	1,757
Large property (10,001 m^2 to 45,000 m^2)	318	317	316	315	314
Very large property (>45,000 m^2)	184	183	182	181	180
Total non-residential customers	**4,144**	**4,197**	**4,250**	**4,303**	**4,356**
Total stormwater drainage customers	**144,515**	**145,266**	**146,017**	**146,783**	**147,551**

Notes: This table presents total stormwater drainage properties. The declared drainage areas remain unchanged during the 2022 determination period.
Source: CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for water services*, September 2021, p 30-31, CCC Water, 2019-20 AIR, September 2021 and IPART analysis.

2.2 We used CCC Water's proposed water demand forecasts

To forecast water sales, CCC Water used the Integrated Supply and Demand Planning (iSDP) model. Hunter Water Corporation also used this model for its 2020 pricing proposal to IPART.[8]

The iSDP model was developed by the Institute of Sustainable Futures (ISF) and is an end-use model. Its approach to forecasting is based on population growth and future changes in water usage in residential fixtures and non-residential sector trends.

CCC Water also used the iSDP model in its 2018 pricing proposal to forecast water sales. It engaged the ISF to review its model which concluded that CCC Water had applied the iSDP model successfully and that its forecasts appeared reasonable.[9] In its 2018 review, the ISF also made recommendations to CCC Water to improve its demand forecasting in the future.

For its 2021 pricing proposal, CCC Water engaged the ISF again to review its model and water demand forecasts, seeking advice on what changes it could make to improve forecasts and ensure they were 'fit for purpose'.[f] While also acknowledging progress made by CCC Water on the ISF's recommendations from 2018, the ISF made 22 recommendations to CCC Water to improve its water demand forecasts.[10] CCC Water updated its water demand model and forecasts in response.

After reviewing CCC Water's proposed water demand forecasts and water demand model, we are satisfied with the extent to which CCC Water has addressed the ISF's recommendations. Our view is that CCC Water's water demand forecasts over the 2022 determination period are reasonable, and its water demand model is robust. We decided to adopt CCC Water's forecasts and used them in setting our final water prices for the 2022 determination period.

CCC Water's forecasts for the next 4 years take into account how the climate has changed, and factors in how those changes have affected water demand up to the present day. While CCC Water has applied climate correction to its water demand forecasts for its pricing proposal, as recommended in the 2019-20 review, we acknowledge that CCC Water's demand forecasts provided in its pricing proposal do not incorporate the impacts of climate change between now and 2026. However, CCC Water has incorporated climate change impacts in its modelling for its Central Coast Draft Water Security Plan.[11] We acknowledge that CCC Water has undertaken initial assessment on future increased demand and reduction in yields as part of its Central Coast Water Security Plan.

We recommend that to improve CCC Water's water demand forecasts for the next determination period CCC Water should incorporate climate change impacts into the water demand forecasts it submits as part of its pricing proposal. In its response to our Draft Report, CCC Water sought IPART's feedback on methodologies to integrate future climate change scenarios into its pricing frameworks for water sales forecasts and long-run marginal cost assessments.

[f] CCC Water engaged the ISF to review its demand forecasts for both its IPART submission and its Integrated Water Resources Plan to 2050.

We encourage CCC Water to build on the work it has undertaken for its Water Security Plan. We also consider that CCC Water should in the first instance correspond with other utilities such as Sydney Water and Hunter Water to understand their demand forecasting and incorporation of climate change impacts into their pricing framework. Further information may be available after we next review Sydney Water's demand model.

2.2.1 CCC Water forecasts lower yearly water sales

CCC Water's proposed forecast indicates that it expects its average water sales will be 27,530 ML per year over the 2022 determination period.[12] This is around 5% lower than the forecast average water sales we used to set prices for the 2019 Determination (which was 29,045 ML per year) (see Table 2.4).

Table 2.4 Average yearly water sales (ML)

Average yearly water sales	ML
CCC Water proposed 2019	27,351
IPART decision 2019	29,045
CCC Water proposed 2021	27,530

Source: IPART analysis.

As shown in Figure 2.1, since 2017-18, actual water sales have declined. Changing community attitudes to water conservation, water restrictions and the COVID-19 pandemic during the period are likely to have resulted in lower water use and water sales.

Compared to its actual water sales in 2020-21, CCC Water expects water sales to increase slightly by 0.5% each year (on average) of the 2022 determination period. This amounts to growth by 416 ML from 2022-23 to 2025-26, and total water sales of 110,120 ML over the 4-year 2022 determination period. CCC Water's proposed forecast water sales for 2022-23 are 7% lower than what we allowed for 2021-22. In CCC Water's proposal, it noted that water conservation, an area of focus in the coming years, would potentially reduce water sales.

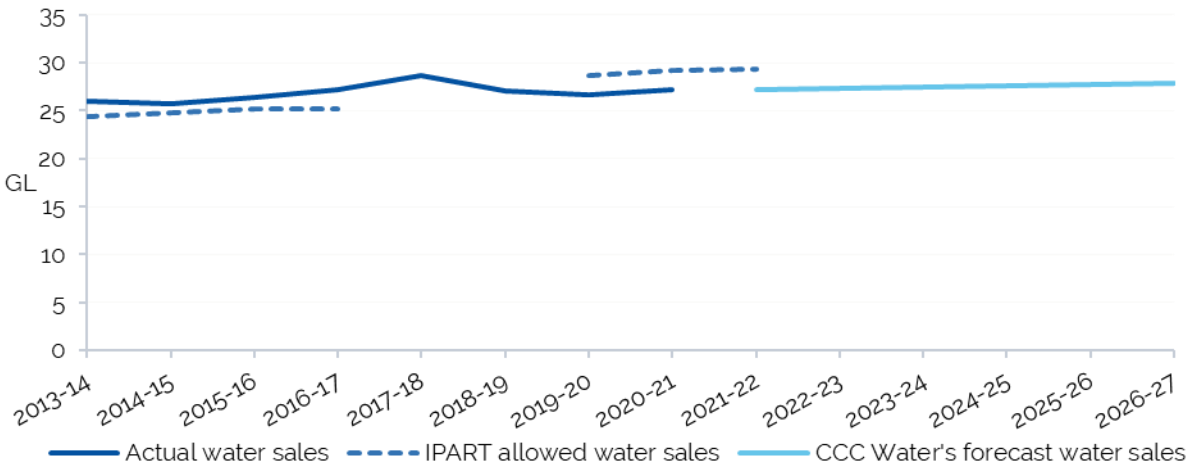
Our decision is to adopt CCC Water's water sales forecasts as presented in Table 2.5 from 1 July 2022 to 30 June 2026. Under our decision, average yearly household sales over the 2022 determination period is expected to be 164 kilolitres (kL) for customers in houses and 101 kL for customers in apartments. This is 1% and 5% less (respectively) than the actual and forecast average yearly household sales for houses and apartments over the 2019 determination period.

Table 2.5 IPART decision on water sales forecasts by property category (ML)

Category	Current 2021-22	IPART decision 2022-23	2023-24	2024-25	2025-26
Stand-alone (Houses)	17,519	17,602	17,655	17,716	17,781
Multi-premises[a] (Apartments)	3,148	3,176	3,222	3,270	3,320
Non-residential[b]	5,361	5,388	5,414	5,440	5,466
Metered exempt properties[c]	1,155	1,160	1,165	1,170	1,175
Total	**27,183**	**27,326**	**27,456**	**27,596**	**27,742**

a. Includes water sales for non-residential mixed multi-premises.
b. Non-residential includes stand-alone, multi-premises and retirement villages.
c. Metered exempt properties includes both residential and non-residential.
Source: CCC Water, 2019-20 AIR, September 2021 and IPART analysis.

Figure 2.1 Water sales are forecast to rise slightly from 2022-23 (GL)



Note: Reported values for 2015-16 and 2016-17 were smoothed noting that, due to the council merger in May 2016, 2015-16 reported actuals covered a 10.5-month period and 2016-17 reported actuals covered a 13.5-month period. This follows our 2019 Final Report on the council's water, sewerage and stormwater prices.
Source: CCC Water, 2019-20 AIR, September 2021; CCC Water, *pricing proposal to IPART – Technical Paper 7 – Demand for water services*, September 2021, p 15; IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 72 and IPART analysis.

2.2.2 We have allowed average yearly water sales of $60.6 million

Under our prices, our forecast average yearly revenue from water sales is $60.6 million ($2021-22). This is 4% higher than CCC Water's actual and estimated[g] average yearly sales over the 2019 determination period, but 3% lower than the average yearly sales we allowed when we set prices for the 2019 determination period.

[g] Water sales are estimated for the current year 2021-22.

2.2.3 We maintained the equivalent tenement value at 150kL

The equivalent tenement is the measure of the yearly water demand a new development will place on water and wastewater infrastructure compared to an average residential dwelling. We set a value for the equivalent tenement as part our price determination, and CCC Water uses this value in setting its developer charges.

Our decision is to maintain the average residential consumption per customer for the purpose of setting developer charges to 150 kL for each year of the 2022 determination period. This value generally reflects the typical usage for a house over time, which over the 10 years between 2016-17 to 2026-27 is forecast to be 166 kL on average. This is not expected to change greatly over the 2022 determination period.

2.3 We set wastewater prices using revised non-residential discharge factors

Wastewater charges depend on whether a customer has a residential or non-residential property, the property's meter size (for residential customers, this is deemed to be 20 mm), billable discharge volumes and discharge factors.

Our decision is to maintain the current deemed discharge allowances and a 75% discharge factor for residential customers for the purpose of setting prices. However, we decided to align wastewater charges so that customers from the former Gosford and Wyong LGAs pay the same prices (see our *Information Paper – Prices and bill impacts*). For non-residential customers this means we have revised and aligned the wastewater discharge factors for the 2 areas.

2.3.1 We maintained the current deemed discharge allowances

Wastewater usage charges for residential customers, as well as non-residential customers within mixed-multiple premises, are levied as fixed charges. These are based on a deemed discharge allowance which depends on the customer's property type. These allowances are an estimate of how much wastewater we expect different property types to discharge into the wastewater system.

In the 2019 Determination, we lowered the deemed discharge allowance of 150 kL from the 2013 Determination as we considered it to be too high. We also set different deemed discharge allowances for houses, apartments and mixed-multiple premises to improve cost-reflectivity of wastewater prices across different types of properties. We set the deemed discharge allowances at:

- 125 kL for standalone residential properties (e.g. houses)
- 80 kL for residential properties within multiple or mixed-multiple premises (e.g. apartments)
- 125 kL for non-residential properties within mixed-multiple premises.[13]

For the 2022 Determination, our decision is to maintain these wastewater deemed discharge allowances.

2.3.2 We aligned non-residential wastewater discharge factors across former Gosford and Wyong LGAs

Discharge factors are used to estimate the amount of wastewater that is discharged to the wastewater network as a proportion of the water a customer uses.[h] They are used to determine wastewater discharge volumes.

Our decision is to maintain the current 75% discharge factor for residential customers and unmetered properties. In the 2019 Determination, we decided to set a discharge factor of 75% for all residential customers. This was based on implied discharge factors from CCC Water's water demand forecasts which ranged from 70-80%.[14,i] For the 2022 Determination, CCC Water intends to maintain the 75% discharge allowance.[15]

For non-residential customers, wastewater usage charges are calculated based on their metered water consumption multiplied by their specific discharge factor.

Currently, the discharge factors for non-residential customers in the former Wyong LGA are higher than those for similar customers in the former Gosford LGA. We consider that these discharge factors should be aligned for the two areas and that they should be adjusted in line with NSW Department of Planning and Environment guidelines. These higher discharge factors would result in higher billable discharge volumes (by 8 ML per year as shown in Table 2.6) than originally proposed by CCC Water,[j] and therefore higher revenue for CCC Water from this source. The higher billable discharge volumes have led to a slightly lower fixed charge which results in a negligible impact overall on typical non-residential bills.[k]

Our final decision is to align non-residential discharge factors across the former Gosford and Wyong LGAs for the purpose of setting prices. Table 2.6 shows the resulting billable discharge volumes reflecting the alignment of wastewater charges across the former Gosford and Wyong LGAs, as well as CCC Water's proposed discharge volumes.

Table 2.6 IPART decision on billable discharge volumes (ML)

	Current	IPART decision			
Category	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**
CCC Water's proposed discharge volumes	3,965	3,985	4,004	4,023	4,043
IPART decision on discharge volumes using aligned discharge factors		3,993	4,012	4,031	4,051

Source: CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for water services*, September 2021, p 18 and IPART analysis.

h Discharge factors are used because wastewater discharges are generally not metered.
i We also applied 75% residential discharge factors in our 2016 Sydney Water and Hunter Water price reviews.
j Compared with discharge factors from CCC Water's pricing proposal submitted in September 2021.
k This impact is estimated to be a $0.06 decrease in bills. IPART analysis.

3 We applied the demand volatility adjustment mechanism

Setting prices based on likely future water demand is important to protect both customers and CCC Water. Because we set prices based on forecast water demand, there is always a risk that actual water demand will be higher or lower than forecast – and therefore that the prices we set will recover more or less than CCC Water's required revenue.

For example, if water demand is more than forecast, prices may be too high, and CCC Water may recover more revenue than it requires. If it is less than forecast, prices may be too low, and CCC Water may recover less than it needs and have trouble covering its costs.

To manage this risk, as part of our 2019 Determination, we decided to consider applying a demand volatility adjustment mechanism (DVAM) in making the 2022 Determination.[16] The DVAM allows us to adjust future prices for the 2022 determination period to reflect any revenue under- or over-recovery due to actual demand in the previous period as a result of material differences between our forecast water demand and actual water demand over this period.

Our decision is:

29. To apply the demand volatility adjustment mechanism (DVAM) to compensate CCC Water for lost water sales compared to what we forecast for the 2019 Determination, amounting to $2.1 million.

3.1 We applied the DVAM to compensate for lower than forecast water sales

In the 2013 Determination, we introduced a demand volatility adjustment mechanism (DVAM) to adjust future prices to reflect revenue under- or over-recovery due to actual demand varying from our forecasts by more than 10% (+ or -). In the 2019 Determination, we decided to narrow the materiality threshold or "deadband" which we would consider making an adjustment to 5% (+ or -) for the next review.[17]

3.1.1 CCC Water's water sales were 6.8% less than forecast

Including a DVAM in the 2019 Determination, meant that CCC Water could apply for an adjustment to prices for the 2022 determination period if actual water sales were 5% higher or lower than forecast. The 2019 determination period was for 3 years between 2019-20 and 2021-22. In the first 2 years of the 2019 Determination, in 2019-2020 and 2020-21, CCC Water's water sales volumes were 6.8% less than what we forecast when we set prices in 2019.

The reasons for this according to CCC Water include:

- Central Coast residents responded to water saving campaigns launched and water restrictions imposed by Hunter Water Corporation in September 2019, due to dry weather conditions in the Central Coast and Hunter regions.
- CCC Water's water savings campaign in mid-2019 and Level 1 restrictions in February 2020.
- Restrictions remained in place until December 2020, despite a large rainfall event in February 2020 which ended the drought.
- The influence of the COVID-19 pandemic on water use behaviour over the same period with an increase in working from home, partial school closures, and alternative business operations.[18]

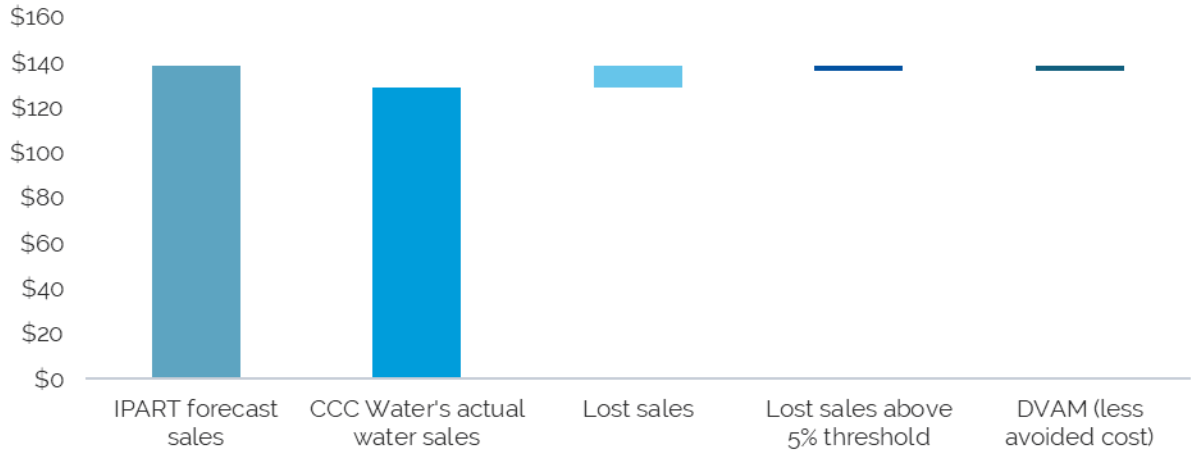
CCC Water has proposed we make a DVAM adjustment to compensate it for all sales losses greater than 5% below our forecast. CCC Water proposed an adjustment of $3.5 million[19] over the 2022 determination period, which includes an adjustment to sales for all 3 years in the 2019 determination period including forecast sales in the final year, 2021-22.

We consider that the DVAM adjustment is appropriate. However, our decision is to apply the DVAM to include only CCC Water's actual water sales during the 2 years from 2019-20 and 2020-21, and not the forecast water sales in the final year of the 2019 determination period, 2021-22. We will consider CCC Water's actual sales in the final year of the 2019 determination period at the next price review. This is in line with our approach to applying the DVAM in the recent 2020 Sydney Water and Hunter Water reviews to consider only actual water sales and not forecast water sales.[20]

We have calculated the DVAM adjustment to be $2.1 million, which we added to CCC Water's notional revenue requirement.[l] In calculating the adjustment, we have also accounted for interest foregone as a result of under-recovery using the real pre-tax WACC of 4.9% from the 2019 Determination. We have also accounted for the avoided cost of supplying water from lost sales above the 5% threshold (see Figure 3.1).

[l] Detailed information is available in our *Technical Paper – How we set the revenue level.*

Figure 3.1 IPART decision on demand volatility adjustment ($ millions)



Note: In $2021-22.
Source: IPART analysis.

4 We have not set a drought price for the 2022 Determination

Higher prices during drought conditions could help CCC Water cover its costs when water sales are lower than expected due to people using less water during water restrictions. It may also help CCC Water cover potentially higher costs during drought.

For the 2022 Determination, we decided to maintain a DVAM and not set a drought price. We will consider whether to apply the DVAM at the next determination for any under- or over- recovery of water sales over the 2022 determination period. We will also consider whether a drought price is appropriate for CCC Water for the next determination period.

Our decision is:

30. To not set a drought price for CCC Water for the 2022 Determination.

31. To consider making an adjustment to future prices to address any over or under-recovery of revenue over the 2022 determination period due to material variation between the level of actual water sales and forecast water sales used in making the 2022 Determination, where:
    - a material variation is defined as more than 5% (+ or -) over the whole determination period
    - we would only consider adjusting for variation greater than 5% (+ or -).

4.1 We will consider the need for a drought price for the next determination

A drought price is a higher price to be paid by customers under certain drought-related conditions, for example, when dam levels fall below a certain threshold. We introduced a new 'drought price' for Sydney Water Corporation and Hunter Water Corporation in our 2020 reviews.[21]

During drought conditions, water restrictions typically come into force, and households and businesses use less water. As a result, CCC Water earns less income, even though the costs of providing water services remain the same, or even increase when water is scarce (e.g. if there are increased pipe breakages due to dry soil). CCC Water might also bear increased costs from undertaking water restrictions and water saving marketing campaigns.

A drought price is intended to minimise the risk of under-recovering revenue during drought. Charging a higher water price during drought may help ensure CCC Water can cover its costs. It may also create a stronger incentive for households and businesses to use less water during drought conditions as using less water would reduce the impact of the increased price.

In its pricing proposal, CCC Water did not propose setting a drought price. However, in submissions to our Issues Paper, some people commented on this topic. Some indicated they supported CCC Water charging a higher price during drought – for example, to create a stronger incentive for water conservation. One submission to our Draft Report supported the use of a drought price for the same reason, suggesting that prices would be lower when dam levels are high.[22]

In contrast, the Public Interest Advocacy Centre (PIAC) opposed setting a drought price in its submission to our Issues Paper. It argued that pricing based on short-term issues such as COVID-19 or drought is not appropriate or an effective response to drought conditions. In addition, it suggested that a more effective drought response would include "long-term price signals coordinated with community education and messaging on conservation and behaviour change to influence water use".[23]

After considering stakeholder views, we decided not to set a drought price for CCC Water for the 2022 Determination. Given the current context and complexities of drought pricing, we consider it would not be feasible for CCC Water to estimate a drought price for the 2022 Determination and charge a drought price.

CCC Water agreed with our draft decision not to set a drought price for the 2022 Determination. It noted that it is too early to identify the benefits of the drought prices in place for Hunter Water and Sydney Water and it will consider their experience with drought prices in its next pricing proposal. CCC Water explained the complexity of setting a drought price based on dam storage triggers and timing around promoting water conservation.[24]

Our decision not to set a drought price means CCC Water is exposed to the risk that it could under-recover its required revenue in the event of drought and water restrictions during the 2022 determination period. In CCC Water's submission to our Issues Paper, CCC investigated the probability of needing to put in place restrictions over the pricing period from July 2022 to June 2026. It has indicated that during this period:

- there is about a 20% chance of at least 1 month of Level 1 restrictions (though this is not foreseeable before August 2023)
- there is a lower likelihood of Level 2 or Level 3 restrictions
- Level 4 restrictions are not foreseeable.[25]

In the absence of a drought price, we will consider a DVAM (with a 5% threshold) at the next review of CCC Water's water prices. This would minimise the risk of lost revenue in the event of drought and the introduction of water restrictions in the Central Coast region during the 2022 determination period. A DVAM to compensate CCC Water for potential lost sales over the 2022 determination period would only be applied if the variance of sales exceeds the threshold, that is, if it loses more than 5% of sales or gains more than 5% of sales.

We will again consider whether to set a drought price at our next review of CCC Water's prices, which is due in 2025-26. We may also consider whether the drought prices we set for Sydney Water and Hunter Water in our 2020 reviews continue to be appropriate and whether there is merit in setting drought prices for other water supply authorities in the future.

5 We recommend CCC Water considers climate change risk in the next review

Climate change has the potential to impact future water demand and water supply on the Central Coast. These impacts may lead to higher costs, for example, to maintain or replace water infrastructure affected by higher temperatures or increased frequency of extreme events like droughts, floods and bushfires.

We recognise the importance of considering climate change risks, and for this review we have considered the impacts of climate change on future demand. This is in line with IPART's approach to consider climate change in our regulatory assessments, decisions and advice.

Our recommendations are:

8. That CCC Water improves its water demand forecasts by incorporating the impacts of climate change in its next pricing proposal.

9. That CCC Water considers and incorporates climate change risks and risk management of its investment and management of assets and infrastructure in its next pricing proposal to IPART. We also encourage a longer-term focus and planning for climate change for CCC Water.

5.1 We considered climate change projections on the Central Coast

Based on the latest climate change projections, the Central Coast region is expected to continue to warm on average by about 0.7°C in the near future from now until 2039, and by about 1.9°C in the far future from 2060 to 2079. Rainfall is projected to increase in summer and autumn but is projected to decrease in spring and winter.[26]

CCC Water has noted that the demand forecasts provided in its pricing proposal have not incorporated impacts of climate change. However, it has incorporated climate change in its modelling for the Central Coast Draft Water Security Plan.[27]

We recommend that to improve CCC Water's water demand forecasts for its next pricing proposal, that CCC Water should incorporate climate change impacts in its water forecasts so that it understands the risks that climate change poses on its future water sales.

CCC Water's modelling of climate change impacts on water demand in the long-term indicates water demand could increase on average by 2% under the climate conditions projected to occur in 2050.[m] We have considered that this increase, however, may not capture the variance of peak water demand daily and weekly, in response to increased temperatures from climate change.

Further modelling indicates that water demand on peak days could be on average 3.4% higher under 2050 climate conditions, and even higher on extreme days (3.8%) and ultimate days (3.7%).[n,28] We consider that water demand during these times could have implications on infrastructure capacity, system assets and sizing in the future as this would likely affect the pipe and pump systems with impacts on water pressure. This would be in addition to climate change impacts on water supply and storage infrastructure such as dams. Together, this could mean greater infrastructure expansion, greater capital costs over the long term, as well as costs potentially brought forward.

CCC Water also investigated the impact of climate change on current system yield, that is, the impact on water supply. Under a dry climate scenario, current system yield could be 16% lower while under a wet climate scenario, the current system yield could be 2% lower. CCC Water further indicated that the long-run marginal cost (LRMC) of water would increase if the impacts of climate change resulted in CCC Water needing to bring forward investments (based on a scenario of CCC Water's preferred supply portfolio). CCC Water analysed a number of water LRMC scenarios with a baseline LRMC scenario of $2.14/kL under a medium demand scenario with no impacts from climate change. Under a high water demand scenario with no impacts from climate change the LRMC of water could be $3.26/kL. However, under both a medium and high water demand scenario with the worst predicted climate change, the LRMC of water could be higher.[29]

5.1.1 Our final decisions do not include costs associated with climate change or a desalination project

We considered climate change in making our final decisions.

We understand that there are concerns about costs potentially being brought forward as a result of dealing with climate change. A few submissions to our Draft Report expressed concerns about the Central Coast Water Security Plan, the development of a desalination plant and the timing of the plant being brought forward.[30]

However, CCC Water's 2021 pricing proposal did not include operating or capital costs associated with a desalination project, for the 2022 determination period and our final decisions do not include these costs. Our approach to setting capital expenditure is explained in our *Information Paper – Operating and capital costs.*

[m] Using NARCliM climate change projection models, under both dry and wet futures. This increase does not take into account population growth, improvements in water efficiency or changes to water use patterns over time. The 2% increase in average demand is calculated based on current water use patterns but under climate conditions projected in 2050.

[n] Peak day refers to the average of the 10 highest demand days in a year over the range of simulated years. Extreme day refers to the average of the highest demand days each year over the range of simulated years. Ultimate day refers to the single highest demand day.

The purpose of the analysis on climate change presented in this paper is to indicate the impacts that climate change may have on the Water Supply Authority in potentially leading to different costs or investments brought forward. Therefore, we have recommended that CCC Water consider climate change risks and the impacts these may have on its costs in its next pricing proposal, so that its cost estimates are based on the best available evidence.

5.1.2 We recommend CCC Water consider and incorporate climate change in its next pricing proposal

We recommend that CCC Water consider and incorporate in its next pricing proposal, climate change impacts on future water demand, as well as climate change risk and risk management in its investment and management of assets and infrastructure. Climate change impacts will continue to increase and activities and investments, which are often in long lived infrastructure, will impact CCC Water's capacity to manage and mitigate climate change risk.

We consider that CCC Water should consider, in general, how climate change would not only affect water demand but other areas driving its future pricing proposal. For example, potential changes to assets and maintenance, as well as investments and costs associated with addressing climate change risks, to adapt to and mitigate climate change. We recommend CCC Water further investigate the impacts of climate change risks on its infrastructure and services.

We expect CCC Water to consult with its customers and the community about the costs and benefits of climate change adaptation options to ensure its water system network is resilient, so that service levels are maintained in the long-term.

We recognise all water utilities face climate change challenges. Our expectation about incorporating climate change in water pricing proposals is consistent with those for the other water utilities we regulate.

6 List of decisions and recommendations in this Technical Paper

Our decisions and recommendations included in this Technical Paper are presented below. A complete list of all our Final Report decisions and recommendations is in our *Final Report Summary*.

Our decisions in this Technical Paper are:

23.	To set water, wastewater and stormwater prices using the forecast customer numbers in Table 2.1, Table 2.2 and Table 2.3, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal.	4
24.	To set water prices using the water sales forecasts in Table 2.5, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal.	4
25.	For setting developer charges, to maintain the equivalent tenement value per customer at 150 kilolitres (kL).	4
26.	For setting wastewater prices, to maintain the wastewater deemed discharge allowance for: – standalone residential properties at 125 kilolitres (kL) – multiple and mixed multiple premises at 80 kL – non-residential properties within mixed multiple premises at 125 kL.	4
27.	For setting wastewater prices, to maintain the 75% discharge factor for all residential properties and unmetered properties.	4
28.	To set wastewater prices for non-residential customers using the discharge factors and resulting billable discharge volumes in Table 2.6, as set out in our *Technical Paper – Demand for water services*, in line with CCC Water's proposal to align wastewater charges for customers in the former Gosford local government area with those in the former Wyong local government area.	4
29.	To apply the demand volatility adjustment mechanism (DVAM) to compensate CCC Water for lost water sales compared to what we forecast for the 2019 Determination, amounting to $2.1 million.	13
30.	To not set a drought price for CCC Water for the 2022 Determination.	16
31.	To consider making an adjustment to future prices to address any over or under-recovery of revenue over the 2022 determination period due to material variation between the level of actual water sales and forecast water sales used in making the 2022 Determination, where: – a material variation is defined as more than 5% (+ or -) over the whole determination period – we would only consider adjusting for variation greater than 5% (+ or -).	16

Our recommendations in this Technical Paper are:

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1 CCC Water, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, pp 80-82.
2 H. Orchard, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022.
3 J. Vandermortel, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, J. Strang, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022. IPART, Online Public Hearing – Our draft report on Central Coast Council's water prices from 1 July 2022, Comments/questions asked at the public hearing that we ran out of time for, April 2022.
4 M Campbell, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, Community Environment Network, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, pp 5-9.
5 CCC Water, pricing proposal to IPART, September 2018, p 135.
6 CCC Water, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, pp 80-82.
7 J. Vandermortel, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, J. Strang, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022. IPART, Online Public Hearing – Our draft report on Central Coast Council's water prices from 1 July 2022, Comments/questions asked at the public hearing that we ran out of time for, April 2022.
8 IPART, *Review of prices for Hunter Water Corporation from 1 July 2020 – Final Report*, June 2020, p 72.
9 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 72.
10 Institute for Sustainable Futures (ISF) UTS, *Gap Analysis of water demand forecasting*, October 2020.
11 CCC Water, submission to IPART's Issues Paper for the 2021-22 CCC Water price review, November 2021, p 16.
12 CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for water services,* September 2021, p 1.
13 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 102.
14 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 100-101.
15 CCC Water, pricing proposal to IPART – *Technical Paper 8 Pricing of water, sewerage and stormwater drainage*, September 2021, p 31.
16 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 82.
17 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – Final Report*, May 2019, p 82.
18 CCC Water, pricing proposal to IPART – *Technical Paper 7 Demand for services*, September 2021, p 13.
19 CCC Water, pricing proposal to IPART – *Technical Paper 6* Revenue requirement and financial metrics, September 2021, p 19.
20 IPART, *Review of prices for Sydney Water from 1 July 2020 - Final Report*, June 2020, p 90 and IPART, *Review of prices for Hunter Water Corporation from 1 July 2020 - Final Report*, June 2020, p 29-31
21 IPART, *Review of prices for Sydney Water from 1 July 2020 - Final Report*, June 2020, p 90 and IPART, *Review of prices for Hunter Water Corporation from 1 July 2020 - Final Report*, June 2020, p 29-31.
22 H Orchard, submission to IPART's Draft Report for the 2021-22 CCC Water price review, 14 April 2022.
23 Public Interest Advocacy Centre (PIAC), submission to IPART's Issues Paper for the 2021-22 CCC Water price review, November 2021, p 6.
24 CCC Water, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, pp 81-82.
25 CCC Water, submission to IPART's Issues Paper for the 2021-22 CCC Water price review, November 2021, p 42.
26 NSW Office of Environment and Heritage, *Central Coast Climate Change Snapshot*, November 2014, accessed 18 January 2022.
27 CCC Water, submission to IPART's Issues Paper for the 2021-22 CCC Water price review, November 2021, p 16-17.
28 IPART analysis and modelling provided via email correspondence on 7 December 2021, by Dr Natalie Lockart who undertook climate modelling analysis for CCC Water's water security plan.
29 CCC Water, submission to IPART's Issues Paper for the 2021-22 CCC Water price review, November 2021, p 16-17.
30 M Campbell, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, Community Environment Network, submission to IPART's Draft Report for the 2021-22 CCC Water price review, April 2022, pp 5-9.