8 Pricing of water, wastewater and stormwater services

Technical Paper 8

- Hunter Water undertook a detailed survey of residential customer views on price structures and levels for water and wastewater services. We incorporated this feedback as we were developing proposed prices, along with considering the cost of service and customer impacts.
- Our proposed water usage charge was calculated in accordance with IPART's pricing principles. The water usage charge increases by one per cent per year to $2.51 per kL in 2024-25. This is in line with our long-run marginal cost estimates of $2.50 per kL to $4.00 per kL.
- We propose to continue the transition towards a common wastewater service charge for the owners of houses and apartments – an additional 2.5 per cent per year for those living in apartments.
- We propose an annual 5.8 per cent real increase in stormwater charges for all stormwater customers, in line with the increase in the stormwater revenue requirement.
- We provide 24 one page summaries showing the bill impacts of proposed prices for a cross-section of residential and non-residential customers.

Contents

1. Introduction

Hunter Water has calculated water, wastewater and stormwater prices that allow the recovery of proposed target revenues. Proposed price structures – the recovery of revenues between residential and non-residential customers, fixed and usage charges – reflect IPART's best practice pricing principles and past IPART decisions. We surveyed our customers as to their views on price structures and have incorporated this feedback into our proposed prices. We have transitioned any changes to current price structures, where appropriate, to mitigate bill impacts for specific customer categories.

This technical paper details all of our proposed charges and prices for water, wastewater and stormwater services. Our current prices, regulatory precedent, calculation methodology and reasons for our proposed prices are documented in each section. Summary bill impacts are provided to show the combined movement in proposed prices for 24 residential and non-residential customer categories.

2. Water prices

Water prices consist of a fixed service charge and volumetric usage charge.

2.1 Current water prices

2.1.1 Water usage charge

The water usage charge is applied to the volume of water used by an individual customer. For a typical household customer (185 kL usage per year), usage charges make up around 80 per cent of the total annual water bill. Two rates apply:

- A standard rate for all consumption up to 50,000 kL – the standard charge applies to about 90 per cent of all water consumption.
- A location-based rate for water consumption greater than 50,000 kL per year in seven specific pricing zones – equivalent to the annual consumption of over 270 houses. All consumption under 50,000 kL is charged at the standard rate.

Hunter Water's standard water usage price is $2.39 per kL in 2019-20.

2.1.2 Water service charge

The water service charge is a fixed annual charge and serves, in part, to recover the costs of providing water services that are not recovered via the water usage charge – a revenue 'balancing' item.

A single property based service charge for water applies to all residential customers regardless of their dwelling type and metering arrangement (e.g. freestanding house or apartment).

The water service charge for non-residential customers is calculated with reference to meter size. All properties with a standard 20mm diameter meter pay the same charge as residential customers. Customers with larger meters, business and industrial customers, pay higher service charges based on the number of meter equivalents.

Hunter Water's service charge for a 20mm meter is $100.88 in 2019-20.

Box 1 - IPART's best practice pricing principles

IPART's best practice pricing principles state that:

- Prices should derive sufficient revenue to recover the prudent and efficient costs of delivering the monopoly services
- The price structure should match an agency's cost structure (i.e. usage charges should reflect the marginal cost of supply, and service charges should recover remaining costs)
- Prices for each service should reflect the efficient cost of delivering them and the cost of servicing each customer type (i.e. no cross-subsidies between water, wastewater and stormwater customers, and no cross-subsidies between residential and non-residential customers), and
- Customer preferences, customer impacts and administration costs should be considered when deciding on price structures.

Source: IPART, 2018, Submission Information Package, p. 10.

2.1.3 Regulatory precedent

Hunter Water's current prices are the result of changes introduced over a number of previous IPART price reviews, establishing precedent in price structures and calculation methodologies.

Hunter Water has applied a user-pays philosophy based on long-run marginal cost when setting or proposing prices since the early 1980s:[1]

> *It is efficient for anyone to be allowed to use the facility (say a water supply system) who will meet the marginal cost that their use imposes on the system. The efficient cost is not the cost of turning on a tap for a few minutes (short run marginal cost) which is effectively zero. The efficient price is the price which equals the operating cost of the next increment in the size of the system. With the service priced that way, the revenue generated will cover the next step up in size, and until people are ready to pay for the next step up, they will not pay for the service, in this case water, in the volume necessary to trigger the next step.*

2000 Determination

Introduction of location-based water usage charges

IPART's 2000 Determination accepted Hunter Water's proposed 'location-based' water usage charges for customers with water consumption above 50,000 kL – mainly industrial customers located near bulk water sources and trunk infrastructure.[2] These location-based charges are lower than the standard usage charge and apply in seven defined zones.

[1] Hunter District Water Board, 1982, p.10.
[2] IPART, 2000, Review of prices for Hunter Water – Determination.

2009 Determination

Water usage prices set with reference to the long-run marginal cost of water supply

IPART's 2009 Determination introduced the concept of setting the water usage price with reference to the long-run marginal cost (LRMC) of water supply. [3]

2013 Determination

Standard residential water service charge

IPART's 2013 Determination set service charges in relation to the number of dwellings. Under this arrangement, the same water service charge applies across residential premise types under single ownership. This replaced meter-based charging. [4]

2016 Determination

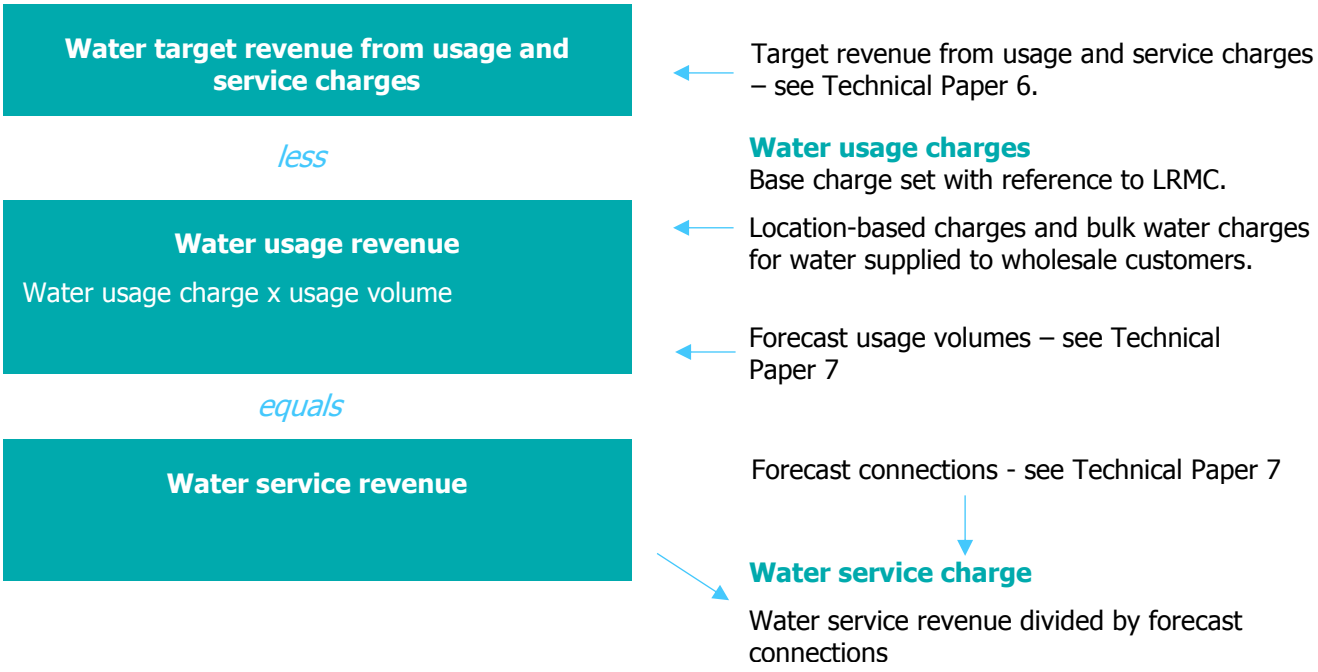
Rebase of charges to 20mm meter base

IPART's 2016 Determination aligned the calculation of residential and non-residential service charges through a rebase of all charges to a common 20mm meter equivalent. All residential dwellings are deemed to have a 20mm water meter and non-residential customers are charged on actual meter size relative to the 20mm meter base. [5]

2.2 Proposed water usage price and service charge

Hunter Water's proposed water prices are set in accordance with IPART's pricing principles. The usage charge is set with reference to the long-run marginal cost of water supply and customer preferences. The fixed service charge is calculated as a balancing item to allow the overall recovery of the water revenue requirement (Figure 2.1).

Figure 2.1 Calculating the water usage and service charges



[3] IPART, 2009, Review of prices for Hunter Water – Final Report.
[4] IPART, 2013, Review of prices for Hunter Water – Final Report.
[5] IPART, 2016, Review of prices for Hunter Water – Final Report.

The target water revenue recovered through usage and service charges is shown in Table 2.1. Our proposed price increases reflect the 1.0 per cent annual growth in the target water revenue, taking into account forecast growth in connections and consumption. This increase in target water revenue is primarily driven by calculating regulatory depreciation using remaining useful asset lives (see Technical Paper 6).

Table 2.1 Target water revenue, 2020-21 to 2024-25, ($millions, $2019-20)

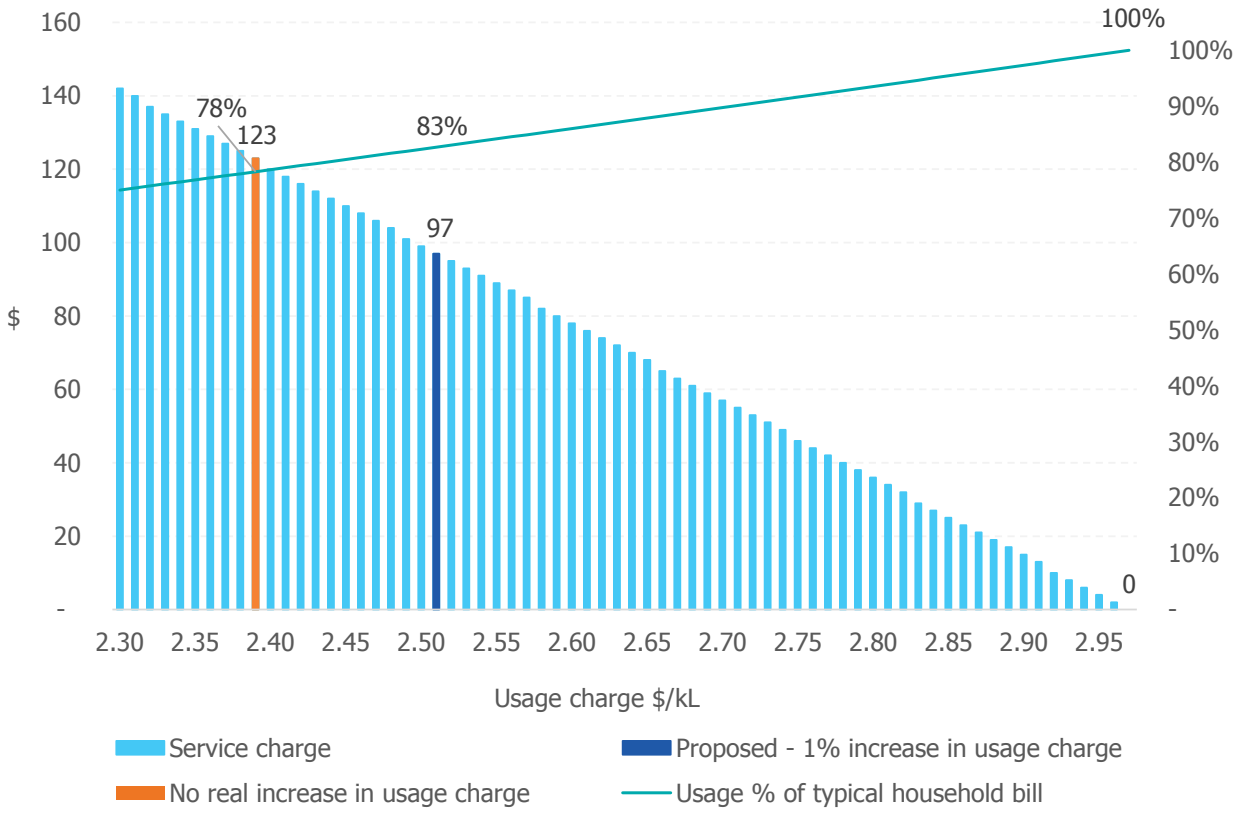
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Target revenue from usage and service charges	161.7	168.1	171.1	173.8	176.9	180.1

Notes:
1. Annual target revenue requirements align with those in Technical Paper 6.
2. 2019-20 is as per IPART 2016 Determination inflated to $2019-20. 2020-25 is Hunter Water proposed.

Source: Hunter Water.

The water target revenue requirement could be recovered through different combinations of the usage price and the water service charge. Figure 2.2 shows the water service charge necessary to recover the revenue requirement in 2024-25, given different water usage charge levels. Setting the usage charge at $2.97 per kL (horizontal axis) results in a zero service charge (vertical axis). This sets a maximum possible level for the water usage price. Our proposal to increase the water usage price over the price path from $2.39 per kL to $2.51 per kL by 2024-25 implies a lower water service charge than if the water usage charge is held constant in real terms ($97 versus $123 per year for each residential property).

Figure 2.2 Different combinations of usage price and service charge in 2024-25 ($millions, $2019-20)



Source: Hunter Water analysis.

2.2.1 Usage charge

Hunter Water's 2015 Price Submission set out a number of reasons for maintaining the water usage price constant in real terms over the course of the current price period: [6]

- Ensures price stability for customers between price periods
- Customer engagement surveys found strong support for maintaining 'controllability' of water bills, and
- Customers consider that higher variable usage charges are more equitable for all water users.

The following sections present the results of customer engagement work in 2018-19, and a separate analysis of the indicative range of Hunter Water's long-run marginal cost estimates of water supply.

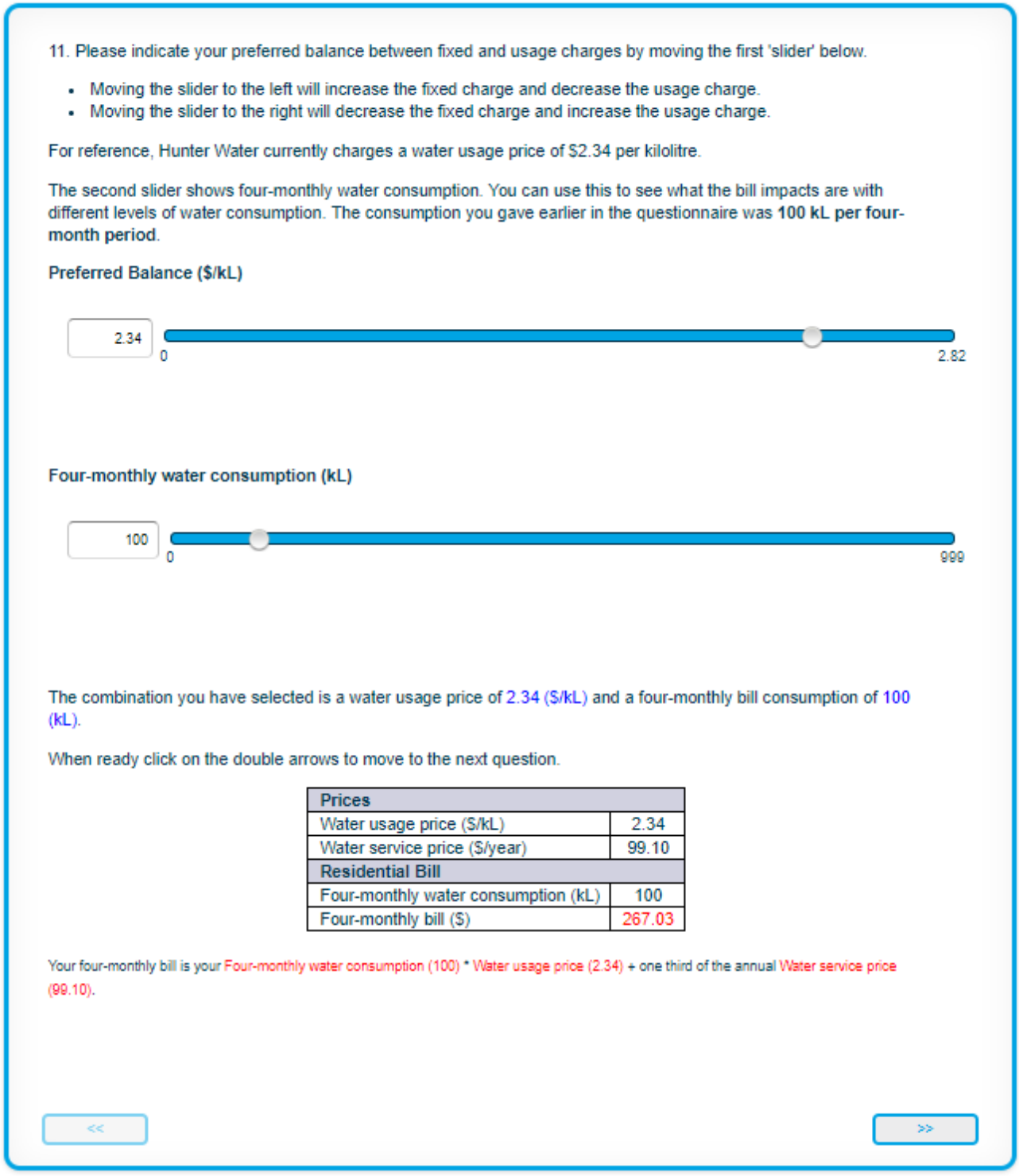
Customer preferences

Hunter Water undertook a comprehensive survey of residential customers' views on price structures and price levels for water and wastewater services.[7]

The residential survey asked customers about their preferred mix of water charges. The survey provided information explaining key considerations when thinking about the way water charges are set, focusing on the balance between usage and fixed charges. The survey then asked customers to indicate their preferred usage charge on an interactive 'slider' tool. The corresponding fixed charge and annual bill were shown and changed in real time as respondents moved the slider. The bill estimate was based on a water usage volume, which could be changed with another slider (Figure 2.3).

[6] Hunter Water, 2015, Price Submission to IPART.
[7] See Technical Paper 1, Section 2.4.2 for a description of the survey design and Technical Paper 1, Attachment B for a copy of the Price structures survey report.

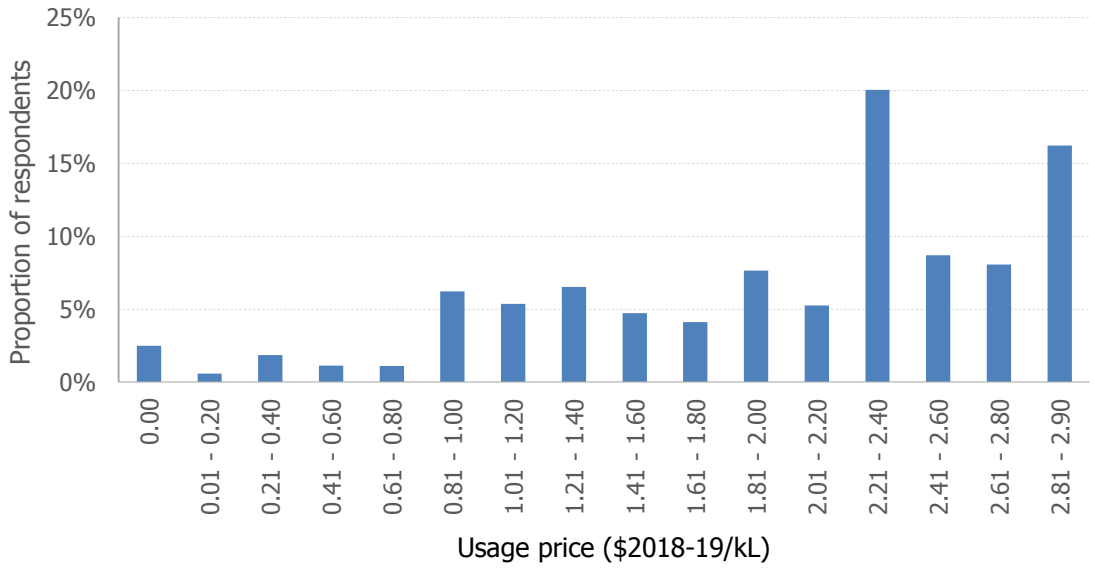
Figure 2.3 Screenshot of 'slider' question in the residential survey



Source: CIE/Woolcott, 2019.

Sixty per cent of customers preferred a water usage price over $2.00 per kL, with a higher response rate for the current usage price and the highest possible usage price with a nil service charge (see Figure 2.4). Customers were also shown the bill impact of their decision, based on the reported water usage volume.

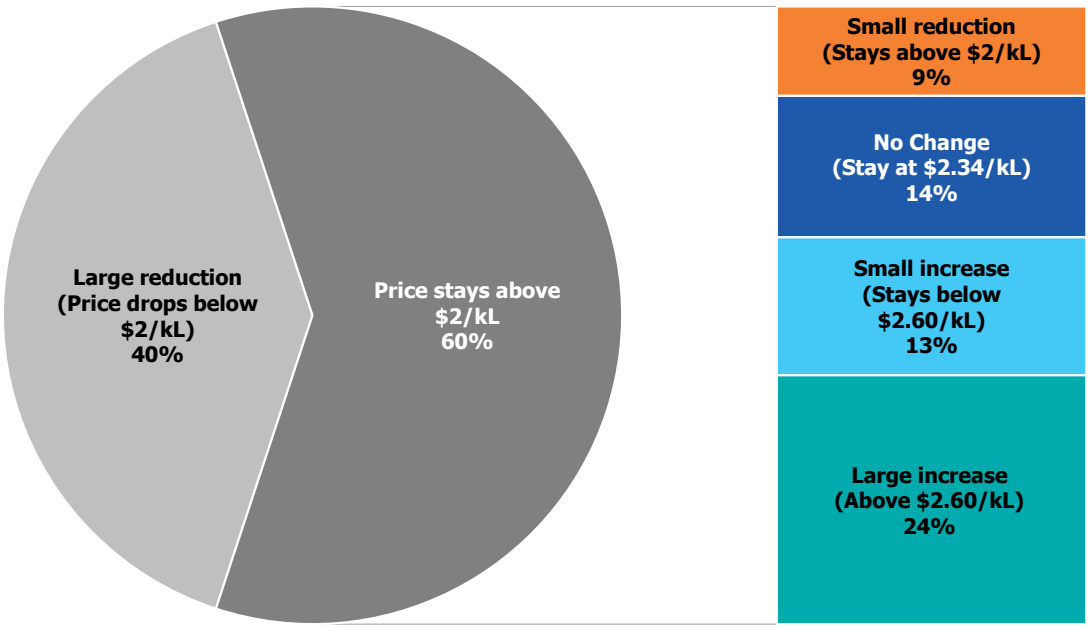
Figure 2.4 Residential customers' preferred water usage price ($2018-19 per kL)



Note: Survey question 11. Please indicate your preferred balance between fixed and usage charges by moving the first 'slider' below.
Source: The CIE, 2019 and Hunter Water analysis.

In the group of customers who preferred a usage price above $2.00 per kL, more than 60 per cent of respondents preferred an increase in the water usage price – a small increase (up to $2.60 per kL) or a large increase (above $2.60 per kL). The chart below provides a breakdown of customer preferences in relation to the extent of any price movement (see Figure 2.5).

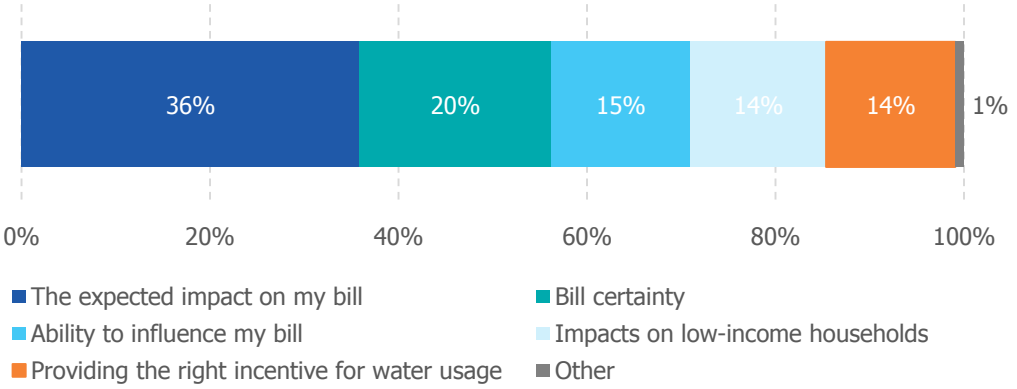
Figure 2.5 Residential customers' preferred water usage price, magnitude of price movement ($2018-19 per kL)



Note: Survey question 11. Please indicate your preferred balance between fixed and usage charges by moving the first 'slider' below.
Source: The CIE, 2019 and Hunter Water analysis.

The residential survey also gathered information on key customer motivations when considering the mix of charges. Customers were asked about their main consideration in choosing a particular usage charge. Private motivations were the most important: the expected impact on the respondent's bill, bill certainty and ability to influence my bill. Social motivations ranked lower: impact on low-income households and providing the right incentive for water usage. Customers with lower usage tended to prefer a higher usage charge.

Figure 2.6 Customer motivations in choosing a fixed and usage charge



Note: Survey question 12. What was your most important consideration when choosing your preferred balance between fixed and usage charges?
Source: The CIE, 2019 and Hunter Water analysis.

Long-run marginal cost of water

IPART's 2016 Final Report set out the following position on LRMC pricing of water services:[8]

> *We generally aim to set the water usage charge with reference to estimates of the Long Run Marginal Cost of water supply, since this promotes efficient water usage and investment decisions. However, at this stage, any estimate of LRMC would be highly uncertain. The Lower Hunter Water Plan does not specify Hunter Water's next supply augmentation.*

Hunter Water and the NSW Department of Industry are currently working on the next iteration of the Lower Hunter Water Plan. This work involves the development of a decision-making framework along with community engagement on key values to guide the planning process. Hunter Water is also undertaking various studies on the feasibility of a short-list of potential demand and supply options, including likely capital and operating costs estimates, likely volumes of water saved or produced, and project lead times.

Hunter Water will undertake a detailed modelling exercise to test various portfolios of options that may satisfy water security objectives across all planning horizons – from the next few years through to the next 50 years. The NSW government will consider the Lower Hunter Water Plan in 2021.

Hypothetical estimates of the LRMC of water supply

Hunter Water's 2017+3 Strategy set out a clear aspiration of delaying the timing of next supply augmentation by several years beyond the dates detailed in the 2014 Lower Hunter Water Plan. [9] Achieving this aspiration would benefit customers by delaying and possibly reducing investment costs, and avoiding potential technology lock-in to an expensive infrastructure solution.

Hunter Water's water resilience program is looking at a wide range of smaller supply and demand measures that will help defer the timing of a future investment in a major and expensive supply measure. Hunter Water does not have any plans to invest in any particular new surface water option or desalination plant. Our water resilience work in recent years has looked at all the actions that we can take now to postpone such a decision, without risking the security of supply to the region.

[8] IPART, 2016, Review of prices for Hunter Water – Final Report, p.101.
[9] Hunter Water, 2017, 2017+3 Strategy.

Hunter Water recognises that IPART places importance on setting the water usage price with reference to the LRMC of water supply. Not only does this set the water usage price, the LRMC estimate feeds into Hunter Water's Economic Level of Water Conservation methodology and the calculation of cost offsets associated with higher-cost recycled water schemes.

Hunter Water has undertaken a body of work to look at indicative LRMC estimates of feasible but hypothetical desalination options. This work was undertaken solely for the purpose of setting the water usage price, not for any planning purpose and does not indicate a preference for a particular option for augmenting supply. This modelling work provides insights into the potential range of LRMC estimates associated with one type of supply augmentation only, and should not be taken as any indication that Hunter Water expects or intends to make any actual investment in desalination facilities or other supply option.

LRMC modelling and assumptions

Hunter Water engaged Marsden Jacob Associates to help quantify LRMC estimates of two hypothetical desalination options – a larger capacity plant (43.8 GL per year) and a smaller (staged) plant (14.6 GL per year).

Marsden Jacob Associates applied two LRMC estimation methods:

- **Average Incremental Cost (AIC) method**: calculates the present value in incremental capital expenditure and operating expenditure divided by the incremental growth in demand.
- **Perturbation (Turvey) method**: calculates the present value in the change in capital expenditure and operating expenditure from an incremental (hypothetical) shift in demand. Marsden Jacob Associates selected a one per cent demand increment as a plausible estimate. The modelling then divides the present value of costs by the present value of consumption.

For the smaller plant, capacity is subsequently doubled to 29.2 GL per year as the first stage reaches full utilisation. The capital cost of the second stage is lower ($392 million) on the basis that it would be built on the same land as the first plant. Key modelling assumptions (see Table 2.1) include:[10]

- **Augmentation timing**: an augmentation would be completed in the year prior to a supply shortfall (the modelling assumes this occurs in 2037-38).
- **Assessment period:** LRMC estimates can vary depending on the time period. The analysis looked at 20, 30, 40 and 50 year periods – we have reported 30 and 50 year periods below.
- **Demand scenarios:** Hunter Water's median long-term forecast, with a high demand (4.9 per cent) scenario and a low demand (minus 4.2 per cent) scenario.
- **Supply scenarios**: Hunter Water's base level supply projections under average weather conditions, as well as wet and dry scenarios (high yield and low yield).
- **Discount rates:** a base real discount rate of 4.1 per cent (equal to the weighted average cost of capital) and sensitivity analysis using 7 per cent and 10 per cent.

Both options involve a single land purchase and infrastructure to accommodate long-term output.

[10] Marsden Jacob Associates, 2019, LRMC analysis.

Table 2.1 Key assumptions in calculating the LRMC of water

Characteristic	Option 1 Large desalination plant	Option 2 Staged desalination plant
Output capacity	43.8 GL pa	14.6 GL pa
Output available	2038	2038
Years to full capacity utilisation	2104	2061
Land cost	$50.0m	$50.0m
Road, pipeline cost	$47.0m	$47.0m
Equipment cost	$845.5m	$394.6m
Total capital costs	**$942.5m**	**$491.6m**
Base plant energy cost	$6.6m pa	$2.2m pa
Process energy cost	$648 per ML	$648 per ML
Annual operating costs	**$56m pa**	**$23m pa**

Source: Hunter Water estimates based on GHD, 2007 and Atkins, 2017.

LRMC results

We present results here for the AIC (Table 2.2) and Turvey (Table 2.3) methods. The calculations were performed over varying time horizons and sensitivity tested using alternative water supply and demand projections. Longer-time horizons, which better capture the supply contribution of the assets, provide more stable LRMC estimates.

Under the AIC method, the staged desalination option produces LRMC estimates in the range of $3.22 per kL to $6.27 per kL over a 30 year period, with a most likely base case estimate of $4.89 per kL. Taking a 50 year outlook, the base case LRMC estimate decreases to $3.70 per kL.

The Turvey method produces a range of $1.27 per kL to $3.85 per kL for the staged desalination option, with a base case estimate of $1.77 per kL. Using a 50 year time horizon, the LRMC estimates range from $1.52 per kL to $2.59 per kL. [11]

The LRMC estimates are especially sensitive to the time horizon and future supply and demand assumptions.

A conservative approach would involve putting a slightly higher weighting on the nearer term estimates (i.e. 30 years) and those that reflect the risk of earlier unexpected shortages. Taking into account both LRMC methods and a 30 and 50 year time horizon, LRMC estimates in the range of $1.77/kL and $4.89/kL appear to be the most relevant for relevant for future long-term water security planning.

[11] Marsden Jacob Associates, 2019, LRMC analysis.

Table 2.2 LRMC estimates ($ per kL), average incremental cost method, 30 and 50 year

Scenario	Time horizon (years)	Option 1 Larger desalination	Option 2 Staged smaller desalination
Base supply-demand	**30**	**$10.06**	**$4.89**
Higher supply (+5%)	30	$6.31	$3.22
Lower supply (-5%)	30	$14.32	$6.83
Higher demand (+4.9%)	30	$13.15	$6.27
Lower demand (-4.2%)	30	$7.32	$3.69
Base supply-demand	**50**	**$6.29**	**$3.70**
Higher supply (+5%)	50	$4.48	$2.64
Lower supply (-5%)	50	$8.33	$4.90
Higher demand (+4.9%)	50	$7.76	$4.61
Lower demand (-4.2%)	50	$5.02	$3.70

Source: Marsden Jacob Associates, 2019.

Table 2.3 LRMC estimates ($ per kL), Turvey method, 30 and 50 year period

Scenario	Time horizon (years)	Option 1 Larger desalination	Option 2 Staged smaller desalination
Base supply-demand	**30**	**$3.86**	**$1.77**
Higher supply (+5%)	30	$2.85	$1.27
Lower supply (-5%)	30	$5.01	$2.35
Higher demand (+4.9%)	30	$4.80	$3.85
Lower demand (-4.2%)	30	$3.09	$1.38
Base supply-demand	**50**	**$3.26**	**$2.02**
Higher supply (+5%)	50	$2.44	$1.52
Lower supply (-5%)	50	$4.18	$2.59
Higher demand (+4.9%)	50	$4.01	$2.51
Lower demand (-4.2%)	50	$2.63	$1.62

Source: Marsden Jacob Associates, 2019.

Box 2 – Short-run marginal cost

IPART's Guidelines for Water Agency Pricing Submissions asks for an estimate of the short-run marginal cost of water. Hunter Water is of the view that the SRMC of water is the change in short-run total cost for a small change in output.

Our proxy SRMC estimate is calculated by aggregating the total direct variable costs of water and dividing these costs by the volume of water sold.

Hunter Water uses an activity-based costing model to calculate relevant costs. We consider that the short-run total cost components should be limited to those expenditure elements that are closely correlated to a small change in output – an increase or decrease of one megalitre. As a result, we only include operating costs associated with chemicals, electricity and other energy expenditure throughout the water system.

Our estimate of the water short-run marginal cost is $0.11 per kL (see Table 2.4).

Table 2.4 Estimation of the water short-run marginal cost (cents per kL)

Parameter	Unit	Values	Notes
Costs (rounded)	$2019-20	6,990,800	1 , 2
Volume	ML	61,978	3
Short-run marginal cost	**cents per kL**	**11.3**	

Notes:
1. Based on allocations made in the 2017-18 activity based costing model to chemicals, electricity, fuel, oil and gas. Includes both direct expense allocations and those specified by organisation unit allocations.
2. Indexed from $2017-18 to $2019-20 using 2.2 per cent and 2.5 per cent respectively
3. Hunter Water AIR/SIR, Non-financial, row 319.

Source: Hunter Water analysis.

Hunter Water's 'Economic Level of Water Conservation' (ELWC) methodology details how the short-run value of water varies at different storage levels, taking into account escalating drought-response costs and the social cost of water restrictions.

Our proposed water usage price

Hunter Water proposes to increase the existing water usage price at a real rate of 1.0 per cent per year (Table 2.5). This aligns with the growth in the annual water revenue requirement taking into account forecast growth in connections and consumption. Hunter Water has not made any price elasticity adjustment for a change in water consumption. We consider the incremental real increase in the usage charge is too small to have a material impact on customer behaviour.

Table 2.5 Hunter Water's proposed water usage prices

	unit	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Movement	per cent	n/a	1.0	1.0	1.0	1.0	1.0
Usage price	$2019-20 per kL	2.39	2.41	2.44	2.46	2.49	2.51

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR Price data, row 36 and Hunter Water revenue requirement analysis.

Hunter Water has a long history of applying usage charges as a means of providing a water conservation signal to end-users. The proposed water usage charge maintains the variable component of the water bill at a relatively high level over the regulatory period, around 80 per cent for the owner of a residential house. This maintains the variable proportion of the combined water and wastewater bill at the current level of 36 per cent for the owner of a residential house.[12]

Hunter Water's proposed water usage prices exhibit a number of benefits:

1. Reflects customer preferences as reported in our residential customer survey
2. Provides price stability across regulatory periods, and
3. Ensures consistent with LRMC pricing – the water usage charge is within the feasible range of LRMC estimates.

2.2.2 Proposed water service charge

We have calculated the water service charge using the number of residential dwellings and the number of meter equivalents for non-residential customers (see Table 2.6).

All residential customers (owners of apartments and houses) are 'deemed' to have a single 20mm meter connection. Non-residential water customers pay the service charge based on actual meter size in relation to the 20mm base. Non-residential customers served by a common meter share the meter-based service charge.

The water service charge is effectively a balancing item in the way that IPART calculates prices. As we have proposed a real increase in the water usage price, the water service charge remains relatively stable in real terms for all residential and non-residential customers over the next regulatory period.

Table 2.6 Proposed water service charge ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Residential						
All dwellings	100.88	100.42	98.53	98.81	97.00	97.24
Non-residential						
20mm	100.88	100.42	98.53	98.81	97.00	97.24
25mm	157.63	156.90	153.95	154.38	151.57	151.94
32mm	258.26	257.07	252.23	252.94	248.33	248.94
40mm	403.53	401.67	394.11	395.22	388.01	388.97
50mm	630.51	627.61	615.79	617.53	606.27	607.77
80mm	1,614.10	1,606.68	1,576.43	1,580.88	1,552.05	1,555.89
100mm	2,522.04	2,510.44	2,463.17	2,470.13	2,425.08	2,431.08
150mm	5,674.59	5,648.49	5,542.14	5,557.79	5,456.43	5,469.92
200mm	10,088.17	10,041.76	9,852.70	9,880.51	9,700.31	9,724.31
250mm	15,762.53	15,690.25	15,394.84	15,438.30	15,156.74	15,194.23
300mm	22,698.05	22,593.96	22,168.57	22,231.15	21,825.70	21,879.70
350mm	30,894.56	30,752.89	30,173.89	30,259.06	29,707.20	29,780.70

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR Price data, rows 17 - 33.

[12] For a typical residential household with annual consumption of 185 kL per year.

Meter-based residential charges

IPART's 2018 Submission Information Package asks Hunter Water to consider meter-based service charges for residential customers.[13] This would apply to both water and wastewater charges.

Under a meter-based charging structure, we would levy the service charge for residential customers based on their actual meter size rather than a deemed meter size based on occupancy. The residential service charge could differ across premise types (i.e. between houses and apartments) and within premise types (e.g. between apartments) based on metering arrangements. Properties owners who share a common meter would only pay their share of the meter-based charge. Apartment owners would often face a lower charge than the owners of houses.

We have calculated the residential water service charge for 2020-21 under a meter-based approach (see Table 2.7). Under meter-based charges, residential customers contribute a slightly smaller proportion of overall revenues compared with a common charge ($24.2 million compared to $24.4 million). The base 20mm charge is higher however under a meter-based approach ($109.62 versus $100.42) as there are fewer residential meter equivalents than dwellings – a nine per cent increase in the stand-alone 20mm charge for residential and non-residential customers.

Table 2.7 Water service charge – common versus meter-based, 2020-21 ($2019-20)

Residential water service charge – 2020-21	Common charge (proposed)	Meter-based charge
Residential customers	243,309 dwellings	220,398 meter equivalents
Residential revenues ($million)	24.4	24.2
Service charges ($2019-20)		
20mm	100.42	109.62
25mm	100.42	171.29
32mm	100.42	280.64
40mm	100.42	438.49
50mm	100.42	685.15
65mm	100.42	1,157.90
80mm	100.42	1,753.97
100mm	100.42	2,740.58

Source: Hunter Water analysis.

Those residential customers who share the service charge of the largest meter sizes, 40mm and above, account for around 9 per cent of the residential customer base. The average service charge per residential dwelling under a meter-based approach can be up to 65 per cent lower compared to those with a 20mm meter (see Table 2.8).

[13] IPART, 2018, Submission Information Package, p.11.

Table 2.8 Service charges under meter-based approach, per dwelling, 2020-21 ($2019-20)

Residential water service charge – 2020-21	Service charge	Indicative service charge per dwelling	Share of residential customers
20mm	109.62	101.97	88%
25mm	171.29	117.35	3%
32mm	280.64	113.42	1%
40mm	438.49	91.32	3%
50mm	685.15	43.84	4%
65mm	1,157.90	39.00	<1%
80mm	1,753.97	42.01	1%
100mm	2,740.58	55.66	<1%

Source: Hunter Water analysis.

IPART identifies some merits of meter-based pricing:[14]

- Simple to understand and based on readily available data
- Provides an indication of peak usage and the customers' share of maximum network capacity, and
- Aligns residential and non-residential service charges.

Hunter Water agrees with the reasoning set out in IPART's 2013 Final Report justifying the move from meter-based charges to a common residential water service charge:[15]

> *Costs of making water available to residential customers vary more by location than property type, and even across property types there is significant overlap in the cost imposed. We have decided that all residential premises should pay the same price for this availability. It is the simplest price structure to understand and has the lowest administration cost.*

Hunter Water prefers the existing approach of using a deemed 20mm meter equivalent for residential property types:

- Meter-based residential charges would create a disincentive for people in existing and new developments to install individual meters as it would cost them more per year in service charges. Without individual meters for each dwelling, the customer loses sight of the price signal relating to their water usage – they would instead pay an entitlement share of total consumption at the common meter.
- There is little difference in meter sizing for residential customers. Non-residential meter-based charges are effective due to the significant variation in the size of meters for non-residential properties.
- The current approach avoids billing anomalies due to unique metering arrangements in multi-premise dwellings.
- A switch to meter-based residential charges would require changes to our new billing system. We would incur additional costs and would need time to implement changes to our billing software.
- We have not received complaints in recent years about the application of residential service charges, suggesting that it is likely to be relatively low priority with customers.

[14] IPART, 2018, Submission Information Package, p.11.
[15] IPART, 2013, Review of Hunter Water prices – Final Report, p.96.

2.2.3 Location-based water usage charges

IPART has set a location-based discount on annual water usage above 50,000 kL for a small number of large water users since 2001. These customers are located in areas close to Hunter Water's bulk water source and trunk infrastructure and rely less on the water distribution network than others.

A location-based charge applied to 19 water customers consuming more than 50,000 kL in seven specific zones in 2018-19. The location-based discount varies across each of the zones, depending on the capital-related costs in each water operational zone: Dungog (25 per cent discount), Tomago-Kooragang (19 per cent), Seaham-Hexham (17 per cent), Newcastle (9 per cent), Lookout (7 per cent), South Wallsend (5 per cent) and Kurri Kurri (1 per cent).

Hunter Water first proposed the location-based charge as a quasi-form of access pricing. In the late 1990s, we observed new competition regimes developing in other utility sectors, and the potential for similar mechanisms in the water industry. Competition in other sectors led to significant price restructuring, with prices for large customers better reflecting actual costs of supply.

Since then, the NSW water sector has seen a number of major regulatory changes; namely, the introduction of an access regime under the *Water Industry Competition Act 2006* and IPART taking on the role of setting wholesale prices for the supply of wholesale services to WIC utilities. Hunter Water is the only major water utility in Australia to offer a declining block tariff for large water users.

The location-based water usage charge reduces the usage revenue from large users by around $2.3 million per year relative to a case where all water users pay the standard usage price. The lower usage revenue increases the water service charge for all water customers – an increase of about $10 per year for each residential customer. The five biggest recipients account for about 80 per cent of the total discount.

Merits of a location-based water usage charge

Hunter Water has considered the advantages and disadvantages of location-based prices (see Table 2.9).

Table 2.9 Merits of a location-based usage charge

Cease location-based charge	Retain location-based charge
Removal of the discount would send a stronger conservation signal to large water users as Hunter Water's supply-demand balance tightens through time. The current Lower Hunter Water Plan is considering a range of new supply measures.	A location-based charge is more cost reflective, even though the 50,000 kL threshold is arbitrary and there is not an equivalent higher usage price for customers in higher-cost zones.
A higher usage price would encourage our largest water users to look more closely at recycled water and water efficiency measures.	The lineal nature of Hunter Water's distribution system means the amount of infrastructure used to supply water increases with the distance from the sources. Hunter Water has a well-developed method for calculating the difference in costs of supplying these customers.
Simpler and more equitable for all customers to pay the same usage charge across the area of operations.	Financial impact on a small sub-set of regional business with the removal of the charge.

Source: Hunter Water analysis.

Customer engagement

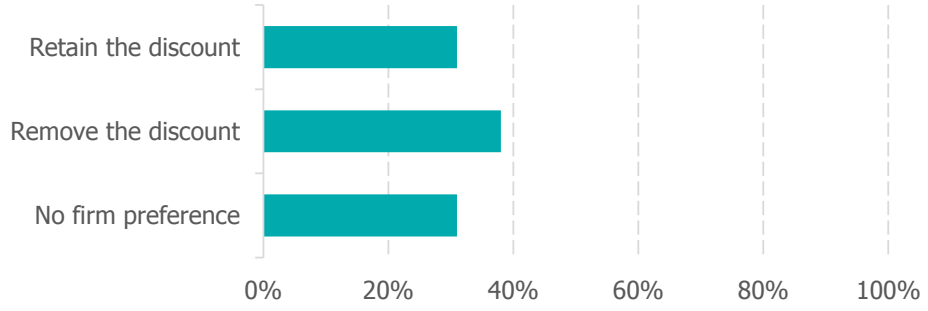
IPART's 2016 Determination accepted our proposal to retain location-based prices, but set out the following recommendation:[16]

> *Hunter Water, in advance of the next price review, consider the merits of the location-based prices and its pricing approach to large non-residential customers generally. This should consider the impacts on all (i.e, those customers that pay location-based prices and the broader customer base) of alternative pricing approaches.*

Hunter Water's residential customer tariff survey posed the question of whether the large user discount should be retained or removed. The survey also asked customers to select a key reason for forming a particular view. The survey provided background information, noting that eligible large users included manufacturers, shopping centres, education facilities and hospitals.

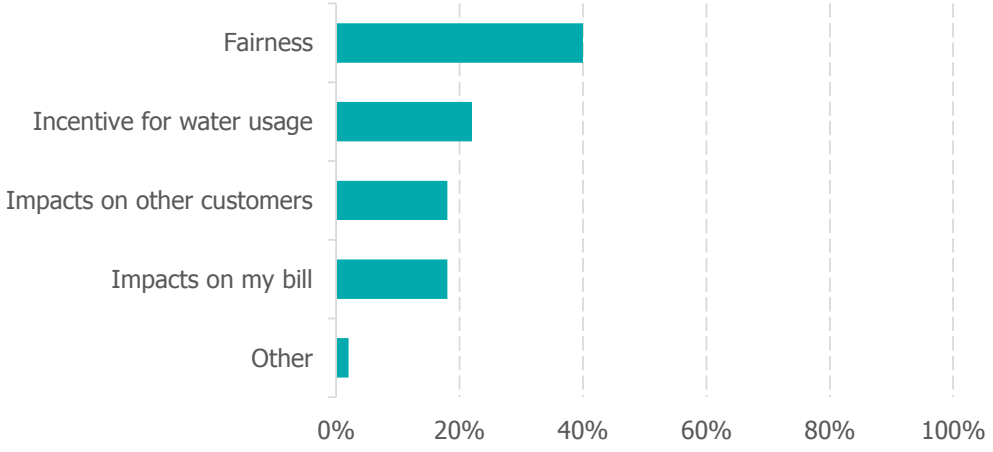
Survey responses were mixed, although the option of removing the discount was favoured (38 per cent of respondents) (see Figure 2.7). Fairness was the motivation most commonly reported overall (see Figure 2.8) and by those who favoured removing the discount. Respondents who preferred to keep the discount were mostly motivated by the impacts that removal would have on the customers receiving the discount.

Figure 2.7 Residential customer preference for location-based discounts



Note: Survey question 16. Please indicate your preference for charging the twenty businesses and industrial customers per unit of water used.
Source: The CIE, 2019 and Hunter Water analysis.

Figure 2.8 Residential customer motivations when considering location-based discounts



Note: Survey question 17. What was your most important consideration when choosing your preference for the usage charge for twenty businesses and industrial customers?
Source: The CIE, 2019 and Hunter Water analysis.

[16] IPART, 2016, Review of prices for Hunter Water – Final Report, p.105.

Our non-residential survey also posed the question of whether to retain the location-based discount. Respondents indicated mixed views, with a large proportion not having a firm preference. Of those who favoured removing the discount, a large proportion were motivated by providing the right incentive for water usage. Fairness and the expected impact on my bill also ranked highly.

Our proposed location-based water usage charges

Hunter Water proposes to phase-out location-based charges over the regulatory period (see Table 2.10). All water customers would pay the same water usage price for all water consumption in 2024-25. Key reasons include:

1. Phasing out the discount for large users sends a stronger water conservation signal as our supply-demand balance tightens.
2. A transition period moderates the immediate bill impacts for eligible large users.
3. Phasing out allows time for Hunter Water to work collaboratively with large customers on developing and implementing water conservation measures.

Table 2.10 Proposed location-based usage charges ($2019-20 per kL)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Base usage price	**2.39**	**2.41**	**2.44**	**2.46**	**2.49**	**2.51**
Dungog	1.92	2.04	2.16	2.27	2.39	2.51
Kurri Kurri	2.36	2.39	2.42	2.45	2.48	2.51
Lookout	2.23	2.29	2.34	2.40	2.45	2.51
Newcastle	2.17	2.24	2.31	2.37	2.44	2.51
Seaham-Hexham	1.97	2.08	2.19	2.29	2.40	2.51
South Wallsend	2.27	2.32	2.37	2.41	2.46	2.51
Tomago-Kooragang	1.92	2.04	2.16	2.27	2.39	2.51
All other areas	2.39	2.41	2.44	2.46	2.49	2.51

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR Price data, rows 44 - 51.

2.2.4 A proposed raw water price

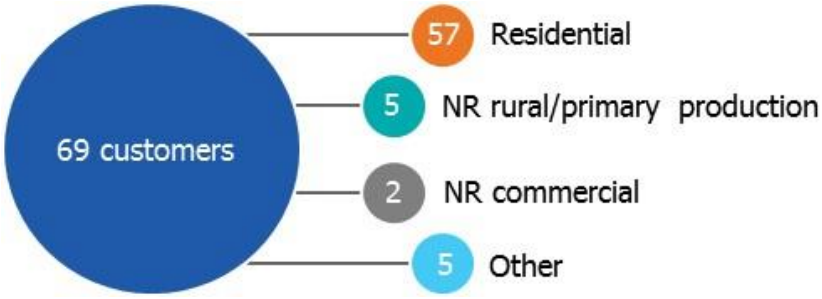
IPART introduced an 'unfiltered water' price for the supply of unfiltered water for customers north of Dungog in 2000. These customers take supply from the upper Chichester Trunk Gravity Main (CTGM) – specifically, the section of trunk main connecting the Chichester Dam and the Dungog Water Treatment Plant.

IPART's 2013 and 2016 Determinations set the unfiltered water charge at the standard water usage price less an estimate of the avoided costs of the treatment process. IPART's methodology uses Hunter Water's estimates of the variable costs of water treatment: electricity and chemical costs. IPART's approach averages these costs using data from all of Hunter Water's water treatment plants. Prior to 2013, IPART provided an additional avoided cost allowance for local network costs.

IPART has not provided any allowance for avoided capital costs on the basis that the small quantity of water supplied to these customers would not materially defer any new or renewal capital expenditure.

There are currently 69 of these CTGM customers, including 57 residential customers and a mix of non-residential customers including rural properties and accommodation providers (see Figure 2.9). Hunter Water is working with these customers to implement individual drinking water supply solutions.

Figure 2.9 Customers who receive water raw water along the CTGM



Retail-minus or cost-plus pricing?

Hunter Water considers there is a reasonable case for moving to a cost-of-service methodology for calculating the charge for these CTGM customers. These customers are effectively buying a raw water service rather than a potable water supply:

- The non-standard agreement for CTGM customers contains qualifying clauses regarding water quality. All other non-standard customers have clauses around the level of service, not the product quality.
- Hunter Water connected these customers when the CTGM was first constructed in the 1920s – a sign of goodwill at the time given the easements through private land. Hunter Water would not connect residential customers to a raw water supply today.
- Hunter Water chlorinates the CTGM water at Chichester Dam, but we cannot rely on this barrier alone without other processes, including filtration, to provide sufficient disinfection to make the water safe for human consumption. The water can vary markedly in quality, particularly turbidity levels, after heavy rain and runoff into Chichester Dam.
- Hunter Water provides no guarantees around supply continuity. The CTGM customers are not eligible for customer rebates if there are supply interruptions.

IPART's 2017 Determination of prices for wholesale water and sewerage services considered the regulatory framework for setting prices. IPART's review looked at alternative pricing methodologies, including the merits of retail-minus pricing and the cost-of-service approach.[17]

IPART decided in favour of retail-minus pricing for wholesale services, as this would enable efficient entry and competition for the benefit of end-use customers over time. IPART took into account the nature of the service provided; that is, a bundled water service of bulk water supply, treatment and transport, and a bundled wastewater service of sewage transportation, treatment and disposal.

Hunter Water is not supplying a bundled water service to the CTGM customers. These customers receive a raw water service not far from Chichester Dam. The raw water service differs significantly from the standard drinking water product we supply to all other retail customers.

Calculating a cost-of-service raw water price

Hunter Water proposes a raw water usage charge that is calculated using a 'bottom-up', cost-plus approach, where the price reflects building block costs relevant to raw water: bulk water costs only (Table 2.11).

[17] IPART, 2017, Prices for wholesale water and sewerage services – Final Report.

Box 3 – Steps in calculating a raw water charge

Calculating the bulk water revenue requirement

Operating costs

- All operating costs directly allocated to 'bulk water'.
- An overhead allocation of corporate costs to bulk water.

Return on assets

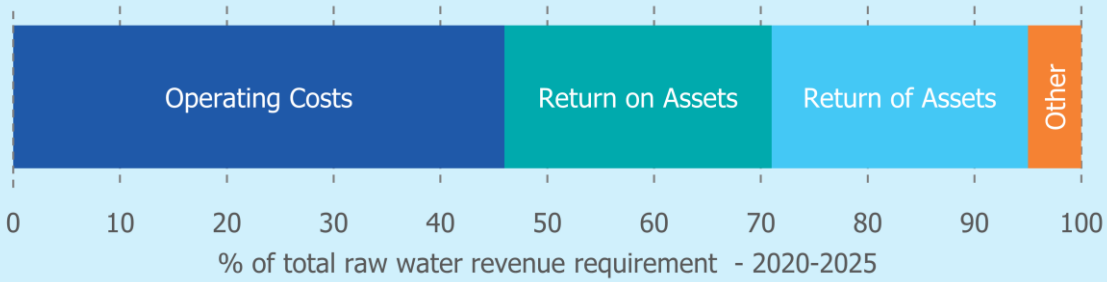
- The opening RAB value is an apportionment of the Water RAB.
- This is based on Depreciated Replacement Cost asset values related to bulk water resources and metering, as a proportion of the Depreciated Replacement Cost of all bulk water assets.
- The roll forward RAB value includes all forward capital expenditure classified as water resources.
- A corporate allocation apportioned based on forecast capital expenditure is included.
- A WACC of 4.1 per cent is applied to the RAB value, consistent with the overall building block methodology.

Return of assets

- Proposed new and existing assets lives are applied to the opening RAB value and forward capital expenditure.
- A corporate allocation apportioned based on forecast capital expenditure is included.

Other

- Tax and working capital are applied consistent with overall revenue requirements. Inventory and prepayments are apportioned based on operating costs.



Calculating a per kL charge

The annual revenue requirement is divided by forecast water consumption per year.

The price is NPV smoothed to achieve a stable price across the price period.

Table 2.11 Annual revenue requirement – bulk water ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	2024-25
Operating costs	16.9	14.6	13.8	13.5	13.6
Return on assets	8.5	8.3	8.0	7.7	7.4
Regulatory depreciation	7.3	7.4	7.4	7.4	7.5
Tax allowance	0.2	0.2	0.2	0.2	0.2
Working capital	1.4	1.3	1.2	1.2	1.2
Revenue requirement	**34.4**	**31.8**	**30.5**	**30.0**	**29.8**

Source: Hunter Water analysis.

The building block revenue requirements have been divided by forecast water consumption each year to derive a volumetric charge per kL (Table 2.12).

Table 2.12 Proposed raw water charge ($2019-20 per kL)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Proposed charge	2.18	0.53	0.53	0.53	0.53	0.53

Note: 2019-20 is the IPART determined unfiltered water charge.
Source: Hunter Water AIR/SIR, SIR Price data, row 53.

Hunter Water notes that WaterNSW (Greater Sydney area) has both raw water and unfiltered water customers. Raw water customers extract water directly from dams and pay a volumetric charge on water usage. Unfiltered water customers extract water downstream of dams and are generally semi-residential users. They are charged a fixed charge and a volumetric charge on water usage reflecting WaterNSW's bulk water costs.[18]

2.2.5 Inter-regional transfers with Central Coast Council

Hunter Water entered into a supply agreement with the then Gosford and Wyong Councils to build and maintain a pipeline connecting the Hunter and Central Coast water supply systems in 2006.

The Hunter Water-Central Coast pipeline agreement provides for two-way access to water from the neighbouring system for a period of 20 years, along with the construction of interlinking pipes and pumps necessary to facilitate water transfers. The arrangement takes advantage of 'off peak' capacity in each water distribution system.

The pipeline agreement provides for either party to supply potable drinking water to the other on request. Water transfers are subject to minimum storage levels for each party so that the inter-regional transfers do not increase the drought risk of the supplier. Transfers are not required if there are likely to be adverse impacts on the customers of the supplying party, such as during peak-demand periods.

Hunter Water agreed to supply an average of 33 ML per day while Hunter Water's existing storages are above 70 per cent. As storages fall below 70 per cent, the transfer rate is wound back in accordance with Hunter Water's risk of entering restrictions and triggering drought response measures. Hunter Water can request water from Central Coast Council when our storage fall below 70 per cent, provided Central Coast storages are above 60 per cent.

IPART's 2013 and 2016 Determinations set the transfer price at the higher of Hunter Water's and the then Gosford and Wyong Councils' SRMC of supplying water – a bulk transfer price of $0.70 per kL in 2019-20.

[18] IPART, 2016, Review of prices for WaterNSW – Final Report.

IPART published a separate final determination for inter-regional bulk water transfers in May 2019. The determination set a maximum price of $0.70 per kL ($2019-20) between Hunter Water and Central Coast for three years to 30 June 2022. [19]

Hunter Water notes that IPART's final determination allows the Central Coast Council to enter into an unregulated price agreement with Hunter Water. We currently have the ability to negotiate a pricing agreement with large water users. We support the retention of this arrangement (see Technical Paper 3, Section 6).

Our price submission contains a water demand forecast for average climate conditions – we do not any bulk water transfers between utilities as a drought-response measure. The inter-regional pipeline does require minimum flows to maintain water quality. The utilities aim for zero net flows in any particular year provided this does not interfere with necessary maintenance work or operational practices.

Our price submission contains forecast operating costs for purchasing water from Central Coast Council and an offsetting adjustment for revenue received for sales to Central Coast Council. We have only included maintenance transfers of 2 ML per day, transferred 50 per cent of the time in either direction. We have used IPART's draft decision on the price for bulk water transfers between Hunter Water and Central Coast Council (Table 2.13). This approach is consistent with the methodology used in IPART's 2016 Determination. The financial result is revenue neutral for Hunter Water.

Table 2.13 Central Coast bulk transfer price ($2019-20 per kL)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Transfer price	0.70	0.70	0.70	0.70	0.70	0.70

Note: 2019-20 is the IPART determined price.
Source: Hunter Water.

2.2.6 Water charge for unmetered properties

Hunter Water has three non-residential unmetered properties – a tiny proportion of the overall customer base. These customers own older commercial buildings located in Newcastle town centre. Hunter Water has not been able to install a water meter to date because of access problems at each connection point.

In 2012, Hunter Water proposed a water charge for unmetered properties comprising a service charge plus a deemed water usage component of 180 kilolitres – consistent with Sydney Water at the time. IPART's 2013 and 2016 Determinations adopted this approach. Hunter Water has applied the same method to calculate the unmetered property water charge for the next regulatory period (see Table 2.14).

Table 2.14 Unmetered property water charge ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Proposed charge	530.18	534.22	537.73	541.61	545.20	549.04

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water.

[19] IPART, 2019, Bulk water transfers - Determination.

3. Wastewater prices

3.1 Current wastewater price structure and prices

Wastewater prices consist of a fixed service charge and a non-residential volumetric usage charge.

3.1.1 Wastewater service charge

The wastewater service charge is a fixed charge set at a level to recover the capital and operating costs of the wastewater system. Most of the costs associated with providing wastewater services are fixed and do not vary with the volume of wastewater discharged. As such, fixed service charges recover nearly all of our wastewater revenue – around 97 per cent of the building block costs.

The wastewater service charge is calculated with reference to water meter size and a sewer discharge factor. The sewer discharge factor is set to reflect the estimated portion of metered water usage discharged into the wastewater system.

The fixed charge is calculated as:

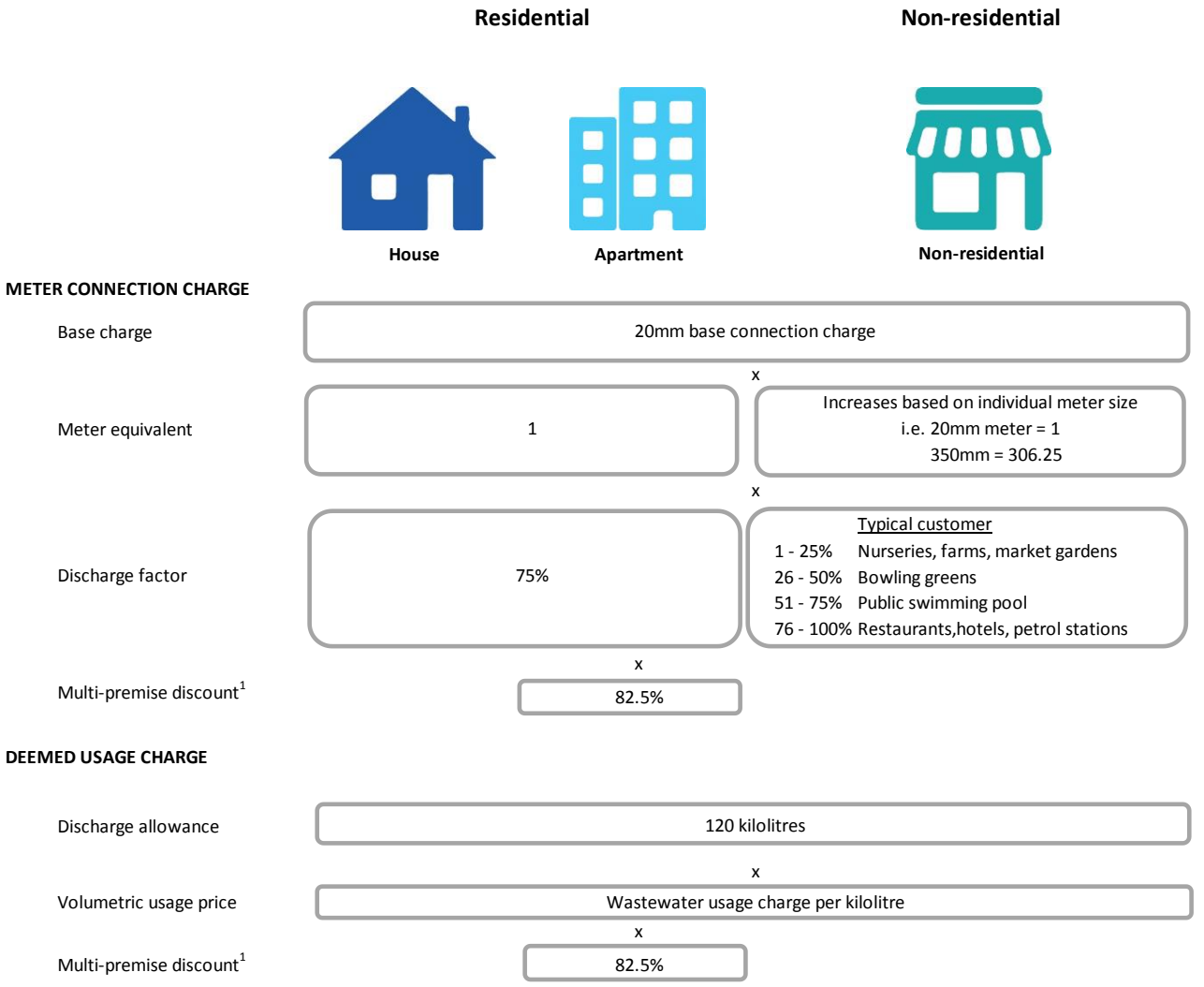
Wastewater service charge = meter connection charge + deemed usage charge

IPART's 2016 Determination continued a transitional arrangement for aligning residential wastewater charges, increasing the charge for the owners of apartments by 2.5 per cent per year over the price period. The apartment charge is set at 82.5 per cent of the equivalent charge for the owners of houses in 2019-20.[20]

Figure 3.1 illustrates the different components of the wastewater service charge and how they are applied to both residential and non-residential customers.

[20] IPART, 2016, Review of prices for Hunter Water – Final Report.

Figure 3.1 Wastewater service charge – connection and usage components



Note: 1. In 2019-20 the charge applied to apartments is equal to 82.5 per cent of the house charge. This has increased by 2.5 per cent per year over the current price path.

Meter connection charge

For all residential customers, a deemed 20mm water meter size and sewer discharge factor of 75 per cent applies to the meter connection charge. The overall wastewater service charge for residential customers applies at two different levels – a charge for those who own a multi-premise (i.e. apartments), and a charge for those who own a stand-alone residence (i.e. houses). About 20 per cent of our residential wastewater customers own an apartment.

The meter connection charge for non-residential customers varies according to water meter size. All properties with a standard 20mm diameter water meter are levied the same base charge as residential customers, prior to application of a discharge factor. Customers with larger meters, mainly commercial and industrial customers, pay a higher meter connection charge.

For non-residential customers, a customer-specific sewer discharge factor is applied. Users with a higher discharge, and a larger relative impost on the wastewater system, pay a higher contribution towards costs. Discharge factors depend on the nature of the individual customer's business. Businesses that typically discharge most of their water use to the sewer (such as hotels, restaurants and petrol stations) have higher discharge factors. Businesses that use most of the water on-site (such as a garden nursery) have lower discharge factors.

In 2019-20, the meter connection charge for a 20mm meter, prior to the application of a discharge factor, is $762.11.

Deemed usage charge

IPART's 2016 Determination stated that all residential and non-residential wastewater service charges must include some allowance for wastewater discharge to the network.[21]

A wastewater discharge allowance of 120 kL per year is included in both the residential and non-residential service charge. This allowance is priced at the current wastewater usage charge per kL.

In 2019-20, the deemed usage charge for a house and non-residential customers is $80.40.

3.1.2 Wastewater usage charges

Wastewater usage charges are a small variable component of non-residential customer bills. In the past, they were intended to cover variable costs associated with wastewater treatment - mainly power, chemicals and waste disposal. The wastewater usage charge is levied on a per kL basis.

Wastewater usage charges are applied explicitly to non-residential customers only where their discharge volumes are above the deemed discharge allowance (Figure 3.2).

Figure 3.2 Wastewater usage charges

Note: 1. Discharge allowance as contained in the wastewater service charge.

The non-residential chargeable discharge volume is based on a customer's metered water usage and a customer-specific sewer discharge factor. The volumetric wastewater usage charge is only applied to the imputed discharge volume above the deemed usage allowance embodied in the service charge (Figure 3.2). This ensures consistency between residential and non-residential charges.

In 2019-20, the wastewater usage charge is $0.67 per kL.

[21] IPART, 2016, Review of prices for Hunter Water – Final Report, p.112.

3.1.3 Regulatory precedent

IPART has made major changes to the setting of wastewater charges for residential and non-residential customers in past determinations, including a substantial restructure of wastewater tariffs in 2016.

2009 Determination

Discontinuation of wastewater usage charge

IPART supported our proposal to discontinue the wastewater usage charge for residential customers. IPART's decision included the application of a fixed service charge only to residential customers. Non-residential customers are still charged both a service and usage charge. This reflects that some businesses can discharge large volumes of wastewater into the system. [22]

2013 Determination

Standard wastewater charge for all residential customers

IPART detailed wastewater price structure principles for residential customers.[23]

> *Our price structure principles are to have a standard wastewater charge for all residential customers, unless there is evidence that the costs of servicing houses and units varies significantly.*

IPART's reasoning was that wastewater infrastructure costs have a large fixed component and reflect wet-weather licence overflow conditions and discharge standards in catchment areas. Costs are largely driven by location rather than by the number of people per household.

At the time, the owners of apartments paid 65 per cent of the wastewater service charge paid by those who owned a house. IPART accepted our proposal to increase the relativity of the apartment to house wastewater service charge from 65 per cent to 75 per cent over the price period (2013-14 to 2016-17). IPART considered this provided a reasonable balance between progress towards cost reflectivity and managing bill impacts for customers.[24]

2016 Determination

IPART made a number of changes to the setting of wastewater charges for both residential and non-residential customers.

Rebase of charges to 20mm meter base with the introduction of a residential sewer discharge factor

IPART aligned the way it calculates residential and non-residential service charges through a rebase of all charges to a common 20mm meter base. All residential dwellings are deemed to have a 20mm water meter. Non-residential customers are charged on actual water meter size relative to the 20mm meter base.

With this approach, IPART introduced a 75 per cent sewer discharge factor to the residential property meter connection charge, on the basis that:[25]

> *This ensures consistency in the treatment of residential and non-residential customers, where the latter currently have a discharge factor applied to their sewerage service charges (for connections other than a stand-alone 20mm meter).*
>
> *While this was not an issue when residential and non-residential bills were set on different bases, it would be inequitable to continue this approach following the rebasing of water and sewerage service charges on a 20mm meter scale by 2019-20.*

Non-residential sewer discharge factors are set with reference to the specific customer.

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[22] IPART, 2009, Review of prices for Hunter Water – Final Report.
[23] IPART, 2013, Review of prices for Hunter Water – Final Report, p. 118.
[24] IPART, 2013, Review of prices for Hunter Water – Final Report, p. 118.
[25] IPART, 2016, Review of prices for Hunter Water – Final Report, p. 114.

Revised calculation of wastewater service charge

Prior to 2016, IPART calculated the wastewater service charge as one fixed charge. While the charge included both a service and deemed usage component, these components were aggregated and not separately determined. Non-residential customers paid this fixed charge in line with the size of their water meter.

In 2016, IPART separated the implicit meter connection and deemed usage components of the wastewater service charge – effectively now presented as two individual charges. IPART identified an anomaly in usage charging whereby non-residential customers with large water meters were paying too much for the deemed usage component (as a result of the multiplication of the overall wastewater service charge by the meter equivalent size). To eliminate this anomaly, the meter equivalent size now only applies to the meter connection component of the wastewater service charge. Figure 3.1 illustrates the two components of the wastewater service charge and the consistency of the deemed usage allowance across both residential and non-residential customers under IPART's revised wastewater charges.

Continued transition towards a standard wastewater charge for all residential customers

IPART continued the transition to a standard residential service charge for both houses and apartments. Over the price period, the service charge for an apartment increases relative to that of a house at a rate of 2.5 per cent per year. By 2019-20, the service charge for the owner of an apartment will be at 82.5 per cent of the service charge for a house. [26]

3.2 Proposed wastewater usage and service charges

Hunter Water's proposed wastewater charges would allow the recovery of the annual wastewater target revenue (Table 3.1). Proposed charges reflect increases in the target wastewater revenue of around 4.0 per cent per year, taking into account forecast growth in connections and consumption. Increases are driven by:

- Investment in the wastewater network primarily due to upgrades to our wastewater treatment facilities to provide capacity for growth or meet environmental regulatory requirements (see Technical Paper 4).
- Higher wastewater operating costs reflects outcomes of upgrades to our wastewater treatment facilities and additional long term preventative maintenance (see Technical Paper 5).
- Calculating regulatory deprecation using remaining useful asset lives for each asset category (see Technical Paper 6).

Table 3.1 Target wastewater revenue, 2020-21 to 2024-25, ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Target revenue from usage and service charges	162.1	169.9	178.9	188.4	198.4	208.8

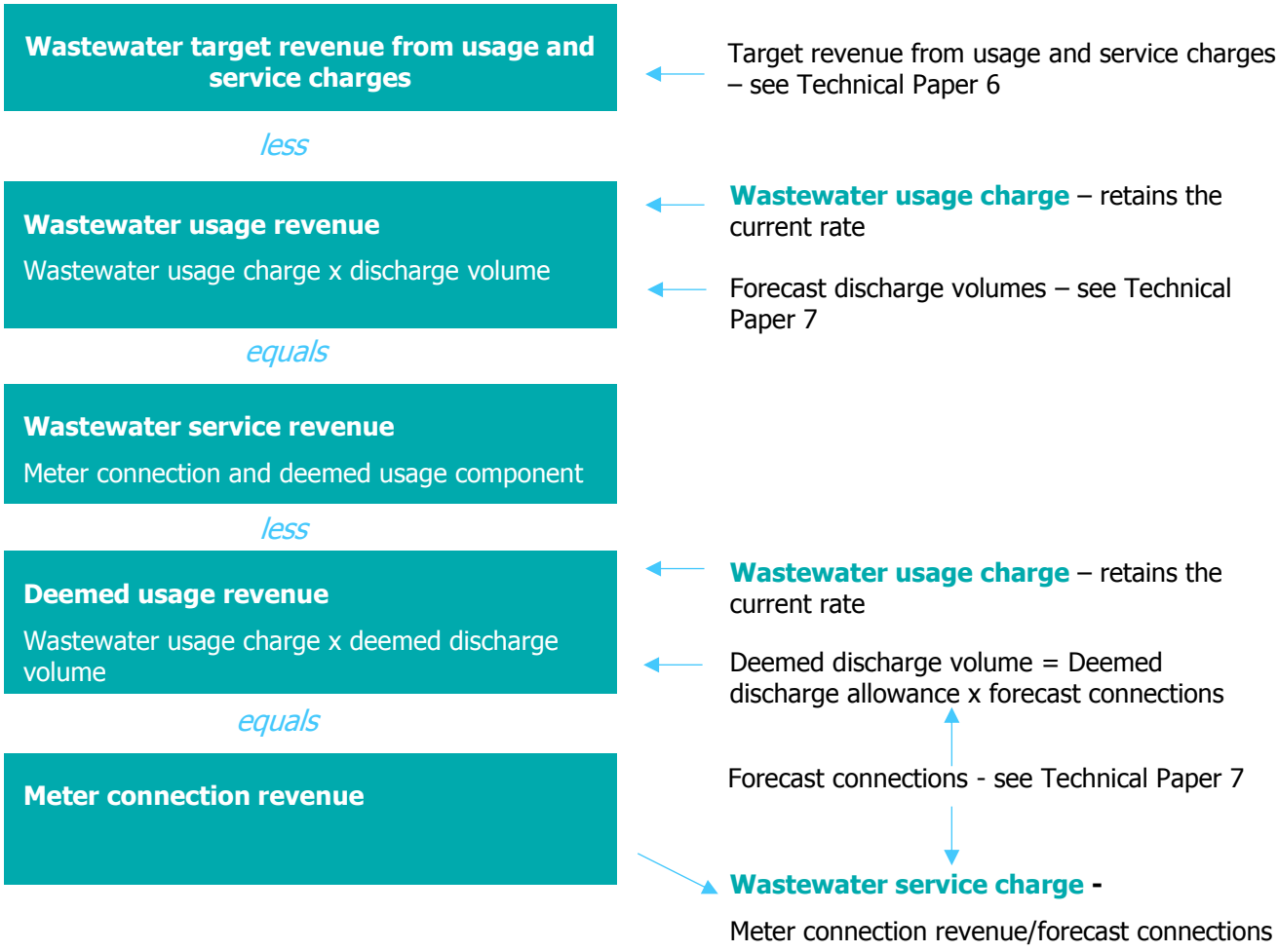
Notes:
1. Annual target revenue requirements align with those in Technical Paper 6.
2. 2019-20 is as per IPART 2016 Determination inflated to $2019-20. 2020-25 is Hunter Water proposed.

Source: Hunter Water.

Our proposed wastewater prices reflect IPART's 2016 Determination and best-practice pricing principles. The usage charge remains at the current rate, and the service charge is calculated as a 'balancing item' to ensure recovery of the wastewater target revenue requirement (Figure 3.3).

[26] IPART, 2016, Review of prices for Hunter Water – Final Report.

Figure 3.3 Calculating the wastewater usage and service charges



3.2.1 Wastewater usage charge

The wastewater usage charge is applied to the deemed usage allowance contained in the wastewater service charge and to non-residential discharge volumes above the deemed allowance.

We propose that the wastewater usage charge remains constant in nominal terms at $0.67 per kilolitre. This is consistent with IPART's approach in the 2013 and 2016 Determinations. The usage price would fall in real terms over the regulatory period (see Table 3.2).

Table 3.2 Proposed wastewater usage charge

		2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Usage charge	$nominal per kL	0.67	0.67	0.67	0.67	0.67	0.67
Usage charge	$2019-20 per kL	0.67	0.65	0.64	0.62	0.61	0.59

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR Price data, row 82.

Short-run marginal cost

In recent price reviews, IPART has looked to set wastewater usage charges with reference to, but not necessarily equal to, the short-run marginal cost (SRMC) of transporting, treating and disposing of domestic-strength effluent.

The SRMC of wastewater is taken to be the change in short-run total cost for a small change in output – effectively a one megalitre increase or decrease. We use an average cost methodology as a proxy for SRMC, calculated by aggregating the total direct variable costs of wastewater and dividing those costs by the volume of wastewater discharged.

The inputs for the calculation are provided by the activity-based-costing model and the discharge volume for the respective year. We base the wastewater SRMC on the costs associated with chemical, electricity and waste disposal expenditure.

Hunter Waters' estimate of the wastewater SRMC is $0.20 per kL (see Table 3.3).

Table 3.3 Estimation of the wastewater short-run marginal cost (cents per kL)

Parameter	Unit	Values	Notes
Costs (rounded)	$2019-20	12,650,100	1, 2
Volume	ML	63,783	3
Short-run marginal cost	**cents per kL**	**19.8**	

Notes:
1. Based on allocations made in the 2017-18 activity based costing model to waste disposal, chemicals, electricity, fuel and oil. Includes both direct expense allocations and those specified by organisation unit allocations.
2. Indexed from $2017-18 to $2019-20 using 2.2 per cent and 2.5 per cent respectively.
3. National Water Indicators. Total wastewater volume 2017-18. Indicator W18.

Source: Hunter Water analysis.

Our proposed wastewater usage charge is higher than our SRMC of wastewater services.

Long-run marginal cost of wastewater services

IPART's Submission Information Package (2018) asks Hunter Water to consider the option of LRMC pricing for wastewater usage. IPART suggests that the LRMC of wastewater discharge could be an important price signal to consumers and the market, as it identifies system constraints – those catchments with the highest potential future costs.

IPART's 2019 Final Determination for Central Coast Council maintained the wastewater usage charge at the existing level of $0.83 per kL ($2018-19) over the price period. Central Coast Council had proposed a lower usage charge of $0.40 per kL – in line with its SRMC.

IPART's final decision expanded on the merits of setting the wastewater usage charge with reference to the LRMC of wastewater services.[27]

> *…setting usage prices with reference to the LRMC could improve price signals (and potentially encourage competition), especially if separate LRMCs could be estimated for each catchment. This could impact customer behaviour at the margin, particularly for large non-residential customers.*

[27] IPART, 2019, Review of Central Coast prices – Final Report, p.105.

Hunter Water's wastewater system

IPART's 2018-19 review of recycled water prices for public water utilities explored the issue of using LRMC estimates of the wastewater system as a proxy for calculating cost offsets associated with recycling schemes that reduce wastewater discharges to the environment.

Hunter Water's response to IPART's Issues Paper noted a number of practical impediments to calculating robust wastewater LRMC estimates:[28]

- Hunter Water's wastewater system comprises 19 wastewater treatment works. Most of these wastewater systems have a single wastewater catchment that is not connected to other wastewater networks; although there are partial interconnections of a few systems. The wastewater catchments vary in size – servicing 800 people to 190,000 people.
- Each wastewater catchment and treatment works would approach a capacity constraint at a different time. The infrastructure and non-infrastructure options available to address the capacity constraint would vary across catchments. It would not be appropriate to calculate a single wastewater LRMC as it would not reflect the different avoided or deferred costs in each location.
- Hunter Water's investment in the wastewater system is largely driven by upgrades of treatment plants to address growth in particular catchments and network upgrades to address capacity problems where there is risk of wet-weather overflows to customer properties and the environment.
- The extent and cost of investment is informed by comprehensive strategy studies that include receiving water monitoring and modelling, along with an assessment of options in conjunction with the EPA. The sequencing and nature of treatment works upgrades is not certain at any point in time, as growth rates and licence 'headroom' vary significantly across catchments.
- Hunter Water is not aware of a well-established and well-accepted LRMC methodology for wastewater systems given the factors listed above.

Cost data

IPART has commenced work in two areas that should provide relevant cost data to inform a future assessment of the LRMC of wastewater systems:

- **Component costing:** IPART initiated a body of work in May 2018 looking at component costing and performance benchmarking for Hunter Water and Sydney Water. This work aims to disaggregate all capital and operating costs into key supply chain functions and geographic supply zones. IPART wrote to Hunter Water in February 2019 confirming that the component costing work was on "hold" until the upcoming retail price reviews were complete. IPART noted the complexities in undertaking this work, and suggested that component costing may complement other potential future work, including estimating the long-run marginal costs of supplying wastewater services and productivity benchmarking.
- **Operating licence requirements**: IPART's 2018 Draft Operating Licence for Sydney Water set out a requirement for Sydney Water to publish at least ten years of servicing information for each region, development or major system. The servicing information must, at a minimum, include information on:[29]
    - Current and projected demand
    - Current and projected capacity constraints
    - Indicative cost of servicing
    - Locations where further investigation is needed
    - Opportunities to investigate servicing options, and
    - The assumptions made in developing the servicing information.

[28] IPART, 2018, Review of Recycled Water prices - Hunter Water response to issues paper.
[29] IPART, 2018, Review of Sydney Water Corporation Operating Licence – Draft Report, p.109.

Hunter Water participated actively and collaboratively in IPART's recent component costing work. We have put in place plans and resourcing to collect and collate cost data across our water and wastewater systems, by catchment and supply-chain component, when the project re-commences in 2020-21.

IPART's next review of Hunter Water's operating licence will take place in 2021-22. We anticipate that IPART will make changes to our operating licence that are similar to the servicing information requirements recommended for Sydney Water's next operating licence. We can see merit in making this information publicly available.

Calculating the long-run marginal cost of wastewater systems

IPART's 2019 draft report on recycled water pricing for public water utilities discusses the use of LRMC estimates for measuring avoided and deferred costs for potable water, wastewater and stormwater services. IPART is of the view that LRMC estimates provide the appropriate pricing signal for the efficient use and investment in infrastructure for all three regulated services over the long-term – usage prices, cost offsets and the value of water saved in the Economic Level of Water Conservation.

IPART agrees with Hunter Water and Sydney Water that it would not be appropriate to use a single LRMC estimate to calculate cost offsets for wastewater services, given that cost drivers tend to be highly catchment specific. [30]

> *We consider the technical challenges of developing reasonably robust and useful LRMC estimates for water, wastewater and stormwater are surmountable. Given the range of overlapping uses of LRMC estimates, and the importance of consistent pricing and investment signals, it is appropriate to develop a common methodology for all relevant LRMC estimates. This will require coordination between the utilities, IPART, relevant government departments, and other interested stakeholders.*

IPART is of the view that the development of LRMC methodologies should be undertaken as a stand-alone review, not as part of a retail price review. IPART notes that, given the number of potential applications of LRMC estimates, it should take a leading role in the development and application of these LRMC estimates.

Hunter Water agrees with IPART's position that the economic regulator should develop common LRMC methodologies. We suggest that this work could usefully run in parallel to the work on component costing in 2020-21.

Our reasons

Hunter Water proposes a usage charge of $0.67 per kL (nominal) for the next regulatory period. Key reasons include:

1. The charge provides price stability across determination periods
2. Work is needed to define a methodology for calculating the LRMC of wastewater, and
3. Hunter Water would need to collect and analyse cost data for each wastewater catchment to feed into an agreed LRMC methodology.

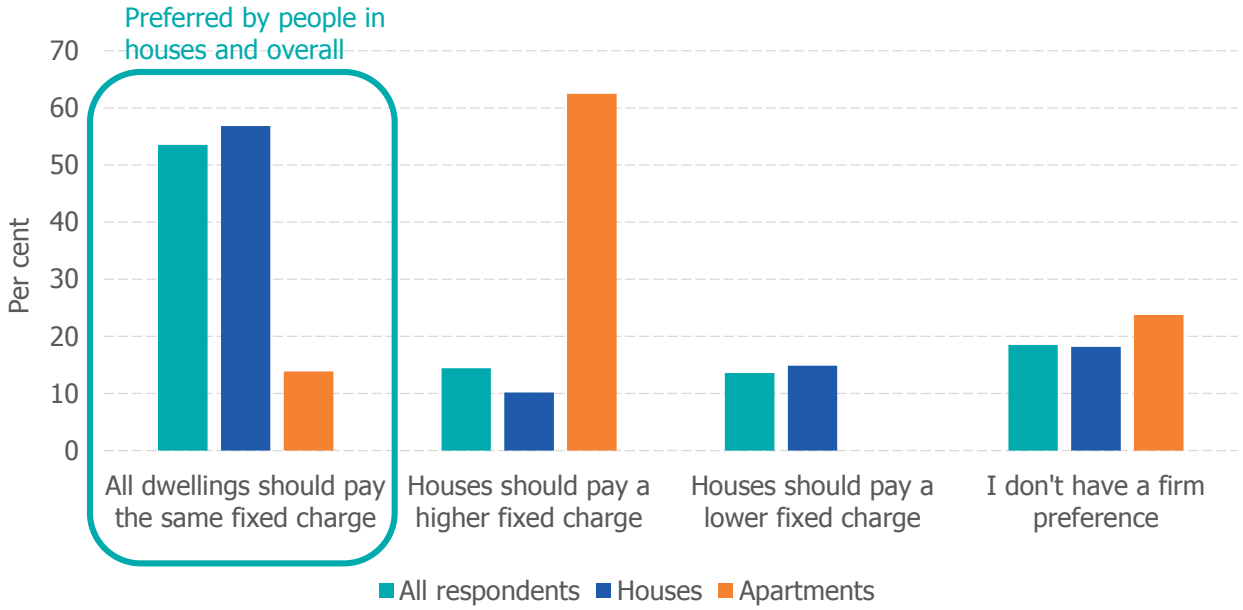
3.2.2 Wastewater service charge

Customer engagement

We asked our residential customers whether the fixed component of a wastewater bill should be the same for all residential customers (for both the owners of houses and apartments). Not surprisingly, customers in a house preferred a common charge, around 80 per cent of wastewater residential customers. Customers in an apartment preferred a separate, lower charge. Overall, just over half of customers indicated a preference for the owners of houses and apartments to pay the same fixed charge (Figure 3.4). [31]

[30] IPART, 2019, Review of recycled water prices – Draft Report, p. 33.
[31] The CIE, 2019, Customer survey.

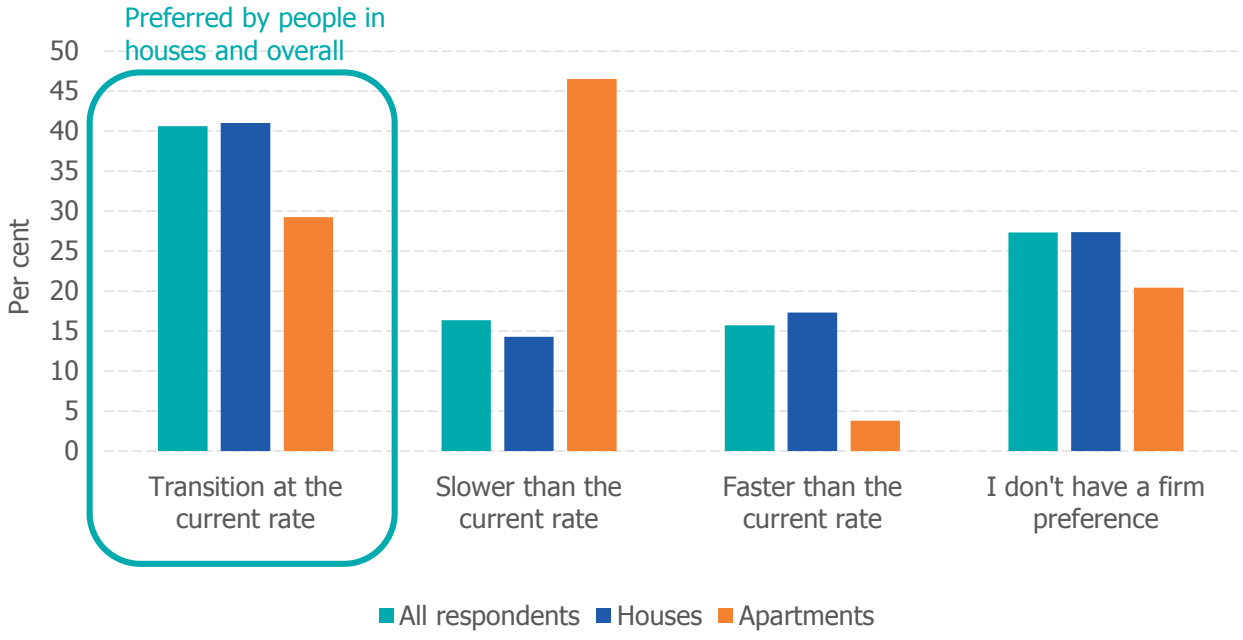
Figure 3.4 Preferred approach to residential fixed wastewater charge



Note: Survey question 19. If the wastewater part of your bill remains fixed with no usage component, should the fixed amount be the same for apartments and houses?
Source: The CIE, 2019 and Hunter Water analysis.

Customers were also asked about their preferred transition to a common fixed charge (assuming we were to implement a common charge structure). Customers could choose to maintain the current rate (a 2.5 per cent increase per year), adopt a slower rate, adopt a faster rate, or, express no firm preference. Forty per cent opted to maintain the current rate (Figure 3.5). Customers living in an apartment preferred a slower rate.

Figure 3.5 Preferred transition approach to a common fixed charge



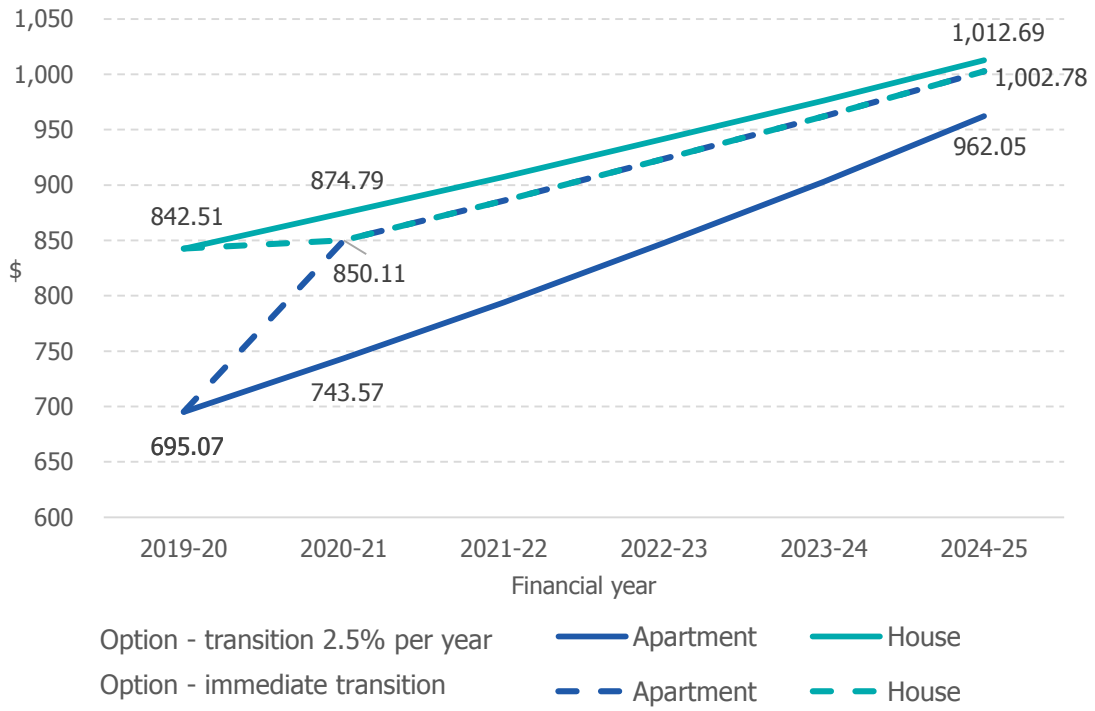
Note: Survey question 20. If Hunter Water were to increase the fixed charge for apartments so that they pay the same fixed charge as houses, how gradual should the change be?
Source: The CIE, 2019 and Hunter Water analysis.

Customers were asked to provide a reason for their preferred wastewater pricing structure. The primary motivation was fairness of bills across all households. The second motivation was the expected impact on individual bills.

Price impacts

Hunter Water considered the option of setting the apartment charge equal to the house charge from the start of the price period (1 July 2020). Under this scenario, the price increase from 2019-20 to 2020-21 for customers who own an apartment would be $155 or 22 per cent (including an increase in both the meter connection charge and deemed usage charge). From 2020-21 to 2024-25 the combined service charge for apartments would then increase in line with houses at 4.2 per cent per annum to reach $1,002.78 by 2024-25 (Figure 3.6). This represents a large initial price shock for apartment owners. We do not favour this option.

Figure 3.6 Transition options for wastewater service charge ($2019-20)



Notes:
1. 2019-20 is IPART determined charges.
2. The service charge represents both meter connection and deemed usage charges.
3. The service charge is prior to the application of the 75% residential sewer discharge factor.

Source: Hunter Water analysis.

The transition approach currently in place for the owners of apartments results in annual real price increases of 6.7 per cent per year for apartment owners (to reach $962.05 by 2024-25). This compares with a real price increase of 3.7 per cent per annum for owners of houses.

Deemed usage charge

Our proposed deemed usage charge includes a wastewater usage charge applied to a deemed usage allowance of 120 kL per year (Table 3.4) for residential and non-residential customers. As such, the deemed usage charge remains constant in nominal terms at the 2019-20 determined charge.

Table 3.4 Proposed deemed usage charge - houses and non-residential ($2019-20)

	Units	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Usage charge	$2019-20 per kL	0.67	0.65	0.64	0.62	0.61	0.59
Discharge allowance	kL	120	120	120	120	120	120
Deemed usage charge	$2019-20	80.40	78.00	76.80	74.40	73.20	70.80

Note: 2019-20 is the IPART determined charge and allowance.
Source: Hunter Water AIR/SIR, SIR Price data, rows 37 and 43.

We propose to continue the transition to a common residential wastewater charge at the same rate as IPART's 2016 Determination. As a result, the charge for the owners of apartments (see Table 3.5) increases by 2.5 per cent per year relative to the charge for an owner of a house. Under this approach, there would be a common residential wastewater service charge in 2026-27.

Table 3.5 Proposed deemed usage charge – apartments ($2019-20)

	Units	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Deemed usage charge - house	$2019-20	80.40	78.00	76.80	74.40	73.20	70.80
Apartment charge relative to house	%	82.5	85.0	87.5	90.0	92.5	95
Deemed usage charge - apartment	$2019-20	66.33	66.30	67.20	66.96	67.71	67.26

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR Price data – rows 37 and 38.

Wastewater usage charges – issues to address

IPART's 2018 Submission Information Package asked Hunter Water to consider the following issues in relation to wastewater usage charges:

- The discharge volume in the deemed usage charge – should there be a different discharge volume for houses and apartments? What is the impact of any changes to non-residential customers?
- Is there merit in introducing an explicit wastewater usage charge for all customers (residential and non-residential)?

Discharge allowance in residential service prices

IPART's 2016 Determination set a residential deemed discharge allowance at 120 kL for each year of the price period. This was based on a deemed residential sewer discharge factor of 75 per cent applied to typical residential water use of 160 kL per year (see Table 3.6).

Table 3.6 Deemed discharge allowance and implied discharge factors

	Typical water use (kL per year)	Deemed discharge allowance (kL per year)	Implied discharge factor (%)
Residential	**160**	**120**	**75**
Houses	185	120	65
Apartments	150	120	80

Source: IPART, 2018, Submission Information Package, p. 12.

For non-residential customers, the deemed discharge allowance transitioned from 50 kL per year in 2015-16 to 120kL per year in 2019-20 (see Table 3.7). This results in a uniform discharge allowance applied to all our customers in 2019-20.

Table 3.7 Deemed discharge allowance in current price period (kL per year)

	2015-16	2016-17	2017-18	2018-19	2019-20
Residential	150.0	120.0	120.0	120.0	120.0
Non-residential	50.0	67.5	85.0	102.5	120.0

Source: IPART 2016 Final Report, p. 108.

Using the same discharge allowance for all residential customers implies that houses have a discharge factor of 65 per cent and apartments have a discharge factor of 80 per cent (Table 3.6). Owners of houses are assumed to discharge less of their water consumption into the wastewater system than the owners of apartments. This is logical given that people in houses are likely to have higher outdoor water use than the owners of apartments.

Hunter Water proposes to continue a common residential discharge allowance of 120 kL, set in line with overall residential typical water usage of 160 kL per year at a 75 per cent sewer discharge factor.

In response to IPART's questions about different discharge volumes for houses and apartments, Hunter Water notes that:

- Our latest consumption data shows typical water use for an apartment at 115 kL per year (IPART used 150 kL per year in 2016). As a result, the 120 kL per year deemed discharge allowance is higher than typical water usage of an apartment.
- The transition to a common residential wastewater charge will take a further seven years to complete. Consequently, the proposed discharge volume applied to apartments is, in effect, less than the 120 kL per year deemed allowance (Table 3.8).

The combination of these two factors for apartments means that the deemed discharge allowance and implied discharge factor are on average 108 kL per year and 94 per cent over the next price period (Table 3.8).

Table 3.8 Deemed versus applied residential discharge allowance - proposed

	2020-21	2021-22	2022-23	2023-24	2024-25	Average
Deemed discharge allowance (kL per year)						
Houses	120	120	120	120	120	**120**
Apartments	120	120	120	120	120	**120**
Applied discharge allowance (kL per year)						
Houses	120	120	120	120	120	**120**
Apartment charge at (%) (1)	85	87.5	90	92.5	95	**90**
Apartments	102	105	108	111	114	**108**
Typical water usage (kL per year)						
Houses	185	185	185	185	185	**185**
Apartments (2)	115	115	115	115	115	**115**
Implied discharge factor (%) (3)						
Houses	65	65	65	65	65	**65**
Apartments	87	91	94	97	99	**94**

Notes:
1. We propose to continue the transition to a common residential wastewater charge at the same rate as IPART's 2016 Determination. As such, the apartment wastewater service charge increases from 85% to 95% of the house charge over the price period.
2. Latest consumption data shows typical water use for an apartment is around 115 kL per year. This is a revision downwards from 150 kL per year used historically by both Hunter Water and IPART.
3. Implied discharge factor is the applied discharge allowance as a proportion of typical water usage.

Source: Hunter Water analysis.

Customer impact analysis shows that if the deemed usage allowance is set at 100 kL per year for the owner of an apartment (implied discharge factor around 87 per cent), the wastewater service charge for apartments would reduce by around a net $4 per year, on average, over the price period.

Hunter Water notes IPART's Final Report for Central Coast Council calculated separate deemed discharge allowances for apartments and houses using a common discharge factor (0.75) and average water consumption for each customer type.[32]

Hunter Water considers that the key issue for the upcoming review is the timing of the transition to a common wastewater service charge. Adding a further layer of complexity by differentiating charges on the basis of deemed usage volumes may cause confusion amongst customers. In addition, we note that:

- IPART has adopted different approaches to setting wastewater service charges and deemed usage charges in past price reviews.
- There is no reliable evidence showing a material difference in the cost-to-serve based on residential dwelling type in our area of operations.
- We question whether different deemed usage allowances and charges would have any material impact on customer behaviour.

[32] IPART, 2019, Review of Central Coast prices – Final Report, p. 103.

Discharge allowance in non-residential service prices

IPART's Final Report for Central Coast Council decided that non-residential wastewater prices would be simpler, more transparent and cost reflective without a discharge allowance.[33] Instead, the wastewater usage charge would apply to all wastewater discharge.

Hunter Water did not consider this approach when finalising tariff modelling for this price submission. We can see merit in IPART's approach for Central Coast Council. We would like to explore this issue in more detail with IPART during the price review.

Explicit residential wastewater usage charge

Hunter Water considers the merits of an explicit wastewater usage charge are evident when:

- Discharge volume is a major driver of costs, and
- A change in price results in a change in customer behaviour, leading to lower overall costs.

Similar to the wastewater usage charge applied to non-residential customers, a residential wastewater usage charge would involve the application of a residential sewer discharge factor to metered water usage. IPART has applied a single residential discharge factor in the past. This is the only practical approach given the administrative complexity and costs of allowing dwelling-specific discharge factors for residential customers.

Until 2009, we charged an explicit wastewater usage charge to both residential and non-residential customers. At the time we proposed the removal of the wastewater usage charge for the following reasons:

- Little water conservation is achieved due to the majority of wastewater discharge being from non-discretionary water use.
- The charge only provides a small additional level of bill control relative to wastewater connection charge.
- Inconsistent application for pre- and post-BASIX properties, whereby some customers also discharge rainwater or recycled water to the wastewater system.
- We regularly received questions and complaints from residential customers who objected to paying a wastewater usage charge that was not based on actual wastewater discharges.

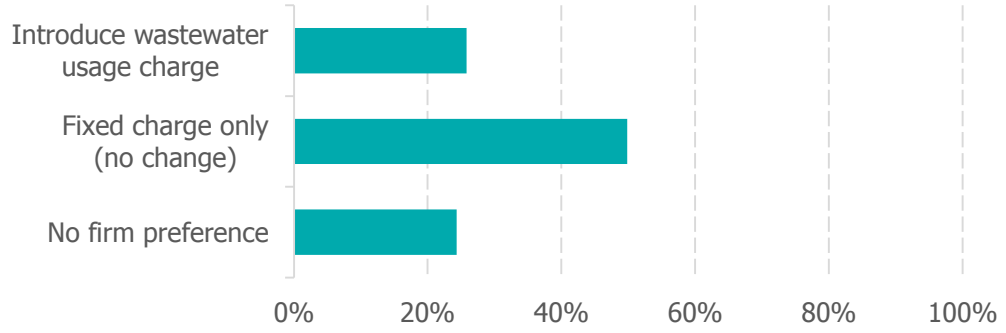
Most of the costs associated with providing wastewater services are fixed and do not vary with the volume of wastewater discharged. Costs are largely driven by wet-weather sewerage overflow licence conditions and discharge standards for each catchment. Pollutant and nutrient waste contained in the discharge are the major cost drivers not discharge volumes. These costs vary by catchment.

Customer engagement

We surveyed our residential customers on whether they think the wastewater part of their bill should include a usage charge. Around half of respondents preferred a continuation of the current wastewater structure with only a fixed charge. Only 26 per cent indicated that an explicit usage charge should be introduced.[34]

[33] IPART, 2019, Review of Central Coast prices – Final Report, p. 103.
[34] The CIE, 2019, Customer survey.

Figure 3.7 Customer views on the introduction of a wastewater usage charge



Note: Survey question 18: Do you think the wastewater part of your bill should include a usage charge on the estimated volume of wastewater discharged from your household?
Source: The CIE, 2019 and Hunter Water analysis.

Bill impacts

The re-introduction of an explicit wastewater usage charge for residential customers would impact customer bills differently based on actual water usage. With an explicit wastewater usage charge, the deemed usage charge implicit in the service charge would be removed. With a 75 per cent discharge factor to the typical water usage of a house and an apartment, an explicit wastewater usage charge would increase a typical bill for owners of houses, and decrease a typical apartment bill (Table 3.9).

Table 3.9 Bill impacts – an explicit wastewater usage charge ($2019-20)

	2020-21	2021-22	2022-23	2023-24	2024-25
Typical House					
Deemed usage charge	78.00	76.80	74.40	73.20	70.80
Wastewater usage charge [1]	90.19	88.80	86.03	84.64	81.86
Bill impact	12.19	12.00	11.63	11.44	11.06
Typical Apartment					
Deemed usage charge	66.30	67.20	66.96	67.71	67.26
Wastewater usage charge [1]	56.06	55.20	53.48	52.61	50.89
Bill impact [2]	(10.24)	(12.00)	(13.48)	(15.10)	(16.37)

Notes:
1. Wastewater usage charges based on a 75% discharge factor applied to typical water usage of 185 kL per year and 115 kL per year respectively for a house and apartment, charged at the proposed wastewater usage charge.
2. The bill impact on apartments is affected by the transition of the apartment deemed usage charge towards that of a house.

Source: Hunter Water analysis.

Meter connection charge

Hunter Water has calculated the meter connection charge in relation to the number of dwellings for residential customers, and in relation to meter size for non-residential customers. All residential customers, (apartments and houses) are deemed to have a single 20mm meter connection and a discharge factor of 75 per cent. Non-residential customers pay based on their actual meter size in relation to the 20mm base and a customer-specific discharge factor. Non-residential customers within a common metered property share the meter-based service charge.

Our proposed meter connection charges are shown in Table 3.10.

Table 3.10 Proposed meter connection charge ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Residential						
Apartment	628.74	677.27	726.81	780.58	835.44	894.79
House	762.11	796.79	830.64	867.31	903.18	941.89
Non-residential						
20mm	762.11	796.79	830.64	867.31	903.18	941.89
25mm	1,190.79	1,244.98	1,297.87	1,355.17	1,411.22	1,471.70
32mm	1,950.98	2,039.77	2,126.43	2,220.31	2,312.14	2,411.24
40mm	3,048.42	3,187.14	3,322.55	3,469.23	3,612.72	3,767.56
50mm	4,763.16	4,979.91	5,191.49	5,420.67	5,644.87	5,886.81
80mm	12,193.67	12,748.58	13,290.21	13,876.92	14,450.87	15,070.22
100mm	19,052.62	19,919.65	20,765.95	21,682.68	22,579.48	23,547.22
150mm	42,868.39	44,819.21	46,723.39	48,786.04	50,803.83	52,981.25
200mm	76,210.46	79,678.60	83,063.81	86,730.74	90,317.91	94,188.88

Notes:
1. 2019-20 is the IPART determined charge.
2. For the purposes of calculating the actual charge paid by customers, residential charges above are to be multiplied by the 75% deemed sewer discharge factor. Non-residential charges are to be multiplied by the customer specific sewer discharge factor.

Source: Hunter Water AIR/SIR, SIR Price data, rows 58 – 74.

3.2.3 Environmental Improvement Charge

Hunter Water has provided sewerage services to backlog areas – townships without a reticulated wastewater service – since the Hunter Sewerage Program (HSP) dating back to the 1980s. We funded backlog schemes through a combination of NSW government social program funding and a levy paid by the broader customer base – the Environmental Improvement Charge (EIC). The EIC was used as a mechanism for the wider customer base to share the costs of these backlog schemes.

The EIC was initially set to run until 2009 to fund projects under the HSP. The addition of five Priority Sewer Program projects in the Lower Hunter was funded by an extension of the EIC until 30 June 2019. IPART's 2016 Determination provided for a one-year extension of the EIC for the Wyee backlog sewerage scheme.[35]

Hunter Water received a Ministerial Direction to complete the Wyee backlog sewerage scheme in May 2017. The NSW Government has also committed to provide $2.4 million directly, or $6,000 per lot, for the Wyee scheme. Hunter Water proposes to fund the remaining costs of the Wyee scheme through our regulatory asset base (see Technical Paper 4). We propose setting the EIC to zero from the beginning of the next regulatory period (Table 3.11).

IPART's 2018 Final Report on maximum prices to connect, extend or upgrade a service introduced a new methodology for calculating the cost of providing backlog sewerage services to existing property owners in the Lower Hunter. Under IPART's revised approach, the existing property owner is liable for Hunter Water's costs of building an extension of the wastewater network to the connecting property. IPART may allow the recovery of some of these costs from the broader customer base where there are measurable environmental, public health or liveability benefits.[36]

[35] IPART, 2016, Review of prices for Hunter Water – Final Report, p.119.
[36] IPART, 2018, Maximum prices to connect, extend or upgrade a service – Final Report.

Table 3.11 Environmental Improvement Charge ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
EIC	41.20	0.00	0.00	0.00	0.00	0.00

Source: Hunter Water.

4. Stormwater prices

Stormwater is rainwater that runs off buildings and land. The proportion of stormwater run-off is relatively high in urban areas due to the presence of hard surfaces such as roads, paved areas and roofs. Stormwater is carried in stormwater channels and discharges directly into creeks, rivers, the harbour and the ocean.

Hunter Water owns and maintains about 90 kilometres of stormwater channel across ten stormwater catchments in the Newcastle, Lake Macquarie and Cessnock areas. There is no single agency responsible for stormwater management within Hunter Water's area of operations.

Hunter Water's role is to maintain the current capacity of the existing stormwater drains and culverts. Councils are responsible for the management of street drainage and any 'natural' creeks upstream and downstream of the concrete channels. NSW Roads and Maritime Services is involved in drainage from major roads and highways.

Hunter Water collects stormwater charges from customers whose properties are located in areas where rainfall runoff enters the stormwater channels and detention basins. Around 30 per cent of Hunter Water's customers are within these catchments: 95 per cent residential and 5 per cent non-residential.

4.1 Current stormwater charges

Stormwater drainage (hereafter 'stormwater') charges are fixed annual amounts for different customer categories.

Hunter Water has almost 71,000 stormwater customers (see Table 4.1). Residential customers are charged according to property type, whereas non-residential customers are charged based on land area. Some large undeveloped properties, such as parks, sports fields and golf courses, have greater ability to absorb stormwater flows than developed properties with hard surfaces. Where appropriate, these properties are classed as low impact properties and pay a low impact charge. IPART introduced a similar low impact category for the owners of houses for which only a small proportion of stormwater leaves the property.

Table 4.1 Hunter Water's stormwater customers, 2020-21

Property type	Number of properties	Percentage of total
Residential properties		
Apartment or low impact	16,597	23%
House	51,244	72%
Non-residential properties		
Small (<1,000m^2) or low impact	1,958	3%
Medium (1,001 to 10,000m^2)	968	1%
Large (10,001 to 45,000m^2)	101	<1%
Very large (>45,000m^2)	15	<1%
Total properties	**70,883**	**100%**

Note: Property numbers align with those presented in Technical Paper 7.
Source: Hunter Water.

4.2 Regulatory precedent

IPART's 2005 Determination

Valuation-based charges

IPART adopted Hunter Water's stormwater pricing reform proposals by phasing out the valuation-based charges applying to non-residential properties over the regulatory period. This was in line with the water pricing principles agreed to by the Council of Australian Governments at that time. [37]

IPART's 2013 Determination

Separate category for residential apartments

IPART agreed to Hunter Water's proposal to introduce a separate customer category for the owners of residential apartments.[38]

IPART's 2016 Determination

Changes to relative prices to improve cost-reflectivity

IPART assessed the level of cost-reflectivity of the current pricing structure. IPART compared:

- The percentage of revenue each customer category contributes to stormwater costs, against,
- The percentage of the total billable property area it represents.

IPART's analysis found that non-residential customers owning larger properties were paying less, on average, than other customer categories. As a result, IPART increased the real stormwater charges for residential and small non-residential customers by 3.7 per cent over four years and the non-residential stormwater charge for customers with a land parcel above 1,000m^2 by 87.3 per cent over the same period. [39]

4.3 Proposed stormwater charges

Proposed stormwater prices are set to recover the annual stormwater revenue requirement given projected customer numbers (see Table 4.2). These prices reflect the annual growth in the target revenue of 5.8 per cent per annum, taking into account forecast growth in connections and consumption. The increase in stormwater target revenue is driven by:

- An improvement in the timing of recovery of investment in stormwater assets through regulatory depreciation (see Technical Paper 6).
- Higher than historic investment in stormwater assets to ensure the system continues to work properly, meet regulatory requirements and to improve safety for the community near high risk stormwater channels (see Technical Paper 4).

Table 4.2 Target stormwater revenue, 2020-21 to 2024-25 ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Target revenue from service charges	5.0	5.6	5.9	6.3	6.6	7.1

Notes:
1. Annual target revenue requirements align with those in Technical Paper 8.
2. 2019-20 is as per IPART 2016 Determination inflated to $2019-20. 2020-25 is Hunter Water proposed.

Source: Hunter Water.

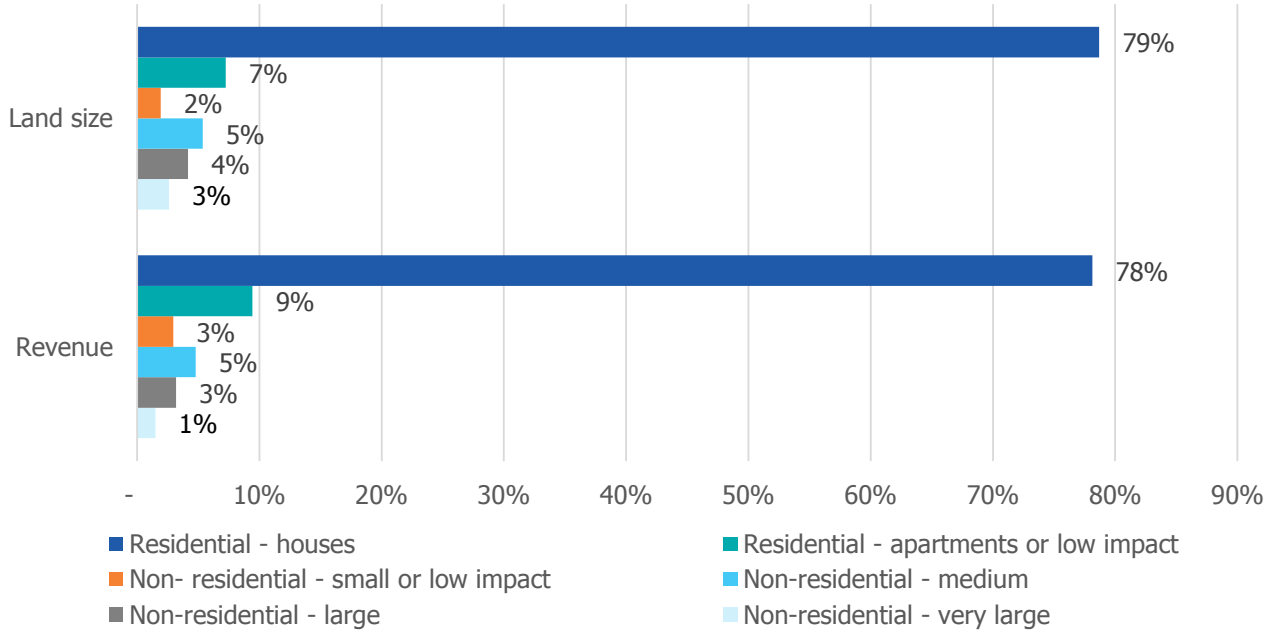
[37] IPART, 2005, Prices of water supply, wastewater and stormwater – Determination and Final Report.
[38] IPART, 2013, Review of prices for Hunter Water – Final Report.
[39] IPART, 2016, Review of prices for Hunter Water – Final Report.

IPART's 2019 Final Report for Central Coast Council sets out IPART's views on the 'impactor pays' approach. IPART recognises that land area, in particular impermeable area, is a determinant of costs, but not the only one. IPART lists a range of cost drivers: [40]

> *How much stormwater and how many pollutants each property contributes to the stormwater system is determined by a variety of factors including land size and slope, the extent of vegetation or proportion of impervious area, the land use and property management (litter and silt levels may differ greatly between residential and business properties, grassed and concreted properties, or properties undergoing construction).*

For each of our stormwater customer categories we have calculated the percentage of total land area across catchments and the breakdown of revenues (see Figure 4.1). The two measures are closely aligned, particular for residential customers (79 per cent of land area and 78 per cent of total revenue).

Figure 4.1 Percentage of land area and revenue recovered, 2020-2025



Source: Hunter Water analysis.

Hunter Water considered proposing an increase in stormwater charges for the largest non-residential customers – where stormwater revenue is less than relative share of land area. We decided against this for the following reasons:

- Land area is a readily available indicator of the contribution to stormwater costs, but land size is only one of many factors that drive expenditure in each of the ten stormwater catchments. The major driver of Hunter Water's capital expenditure is the age of the assets – most of the channels were built in the 1920s and 1930s. Our capital program focuses on renewal works to ensure ongoing service reliability and safety.
- Stormwater run-off can differ markedly between two properties of the same size. As recognised by IPART, the frequency and volume of runoff into stormwater channels depends on the extent of impervious surfaces, vegetation, topography, soil type, location and proximity to the stormwater channel and other natural watercourses.
- The non-residential categories consist of a mix of property types and land area sizes.

[40] IPART, 2019, Review of prices for Central Coast Council - Final Report, p.109.

- The 'very large' category starts at 45,000 square metres with no upper limit. Of the 15 customers in this category, 11 property owners have a land area under 85,000 square metres whereas the average land area size is much higher at around 126,000 square metres.

Reasons for our proposal

Hunter Water's proposed stormwater charges are shown in Table 4.3. Key reasons include:

1. Hunter Water proposes a real increase in stormwater revenues of 36 per cent over the next regulatory period. Our proposed stormwater charges share this increase evenly across all customer categories.
2. While equity across and within customer categories is a desirable end goal, under a system of postage-stamp pricing across ten stormwater catchments there will always be a degree of mismatch between costs and charges.
3. A reallocation of costs to the larger non-residential customer base would result in significant bill impacts, following a real price increase of almost 90 per cent in the current price period. We have aimed to mitigate significant price increases to any one customer group.

Table 4.3 Proposed stormwater charges ($2019-20)

Property type	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Residential						
Apartment	29.61	31.32	33.14	35.07	37.12	39.28
House	80.01	84.63	89.56	94.77	100.29	106.14
Non-residential						
Small or low impact	80.01	84.63	89.56	94.77	100.29	106.14
Medium	261.31	276.39	292.49	309.53	327.56	346.64
Large	1,661.94	1,757.86	1,860.27	1,968.63	2,083.29	2,204.61
Very large	5,280.39	5,585.15	5,910.52	6,254.81	6,619.11	7,004.60

Note: 2019-20 is the IPART determined charge.
Source: Hunter Water AIR/SIR, SIR - Price Data, rows 120 to 128.

5. Bill impacts

This section contains one page summaries of the bill impacts of our proposed prices for 24 different customer categories. Each summary pages shows:

- The composition of the projected annual bill: by product (water, wastewater and stormwater) and charge (service or usage).
- Changes in the bill between the beginning and end of the price period, including an average annual and weekly impact.
- The average water usage component of bills, showing the variable component of each bill.
- The EIC, trade wastewater prices and pensioner rebates are included as components of a typical bill.

Nominal bill impacts are provided for typical residential customers (Table 5.1) and non-residential customers (Table 5.2) – inclusive of 2.5 per cent annual inflation.

Customers with the highest bill impacts are generally those who are affected by a change in price structure. For these customers we have made decisions to transition changes to help moderate price increases over the course of the regulatory period:

- Our decision to continue the transition arrangement to a common residential wastewater service charge (see Section 3.2.2).
- Our decision to phase-out our location-based charges (see Section 2.2.3) will allow time for Hunter Water to work collaboratively with large location-based customers to develop and implement water conservation measures.
- Technical Paper 9 outlines movements in trade waste prices.

Table 5.1 Bill impacts for typical residential customers ($nominal)

Residential property type		2019-20	2024-25	Price period change		Yearly change	
5.1	House - including stormwater	1,316	1,635	319	24%	64	4%
5.2	House - excluding stormwater	1,236	1,515	279	23%	56	4%
5.3	Pensioner household - excluding stormwater	672	868	197	29%	39	5%
5.4	Apartment - excluding stormwater	955	1,272	317	33%	63	6%
5.5	Apartment - including stormwater	984	1,316	332	34%	66	6%

Note: Annual inflation of 2.5% is assumed over the price period.
Source: Hunter Water analysis.

Table 5.2 Bill impacts for sample non-residential customers ($nominal)

Non-residential property type		2019-20	2024-25	Price period change		Yearly change	
5.6	Service station	2,173	2,636	462	21%	92	4%
5.7	Small shop - 20mm meter	1,109	1,380	271	24%	54	4%
5.8	Small shop - 25mm meter	1,972	2,491	520	26%	104	5%
5.9	Large licenced club	55,383	69,168	13,784	25%	2,757	5%
5.10	Medium licenced hotel	5,890	7,220	1,330	23%	266	4%
5.11	Regional shopping centre	349,720	416,694	66,974	19%	13,395	4%
5.12	Large office - Newcastle	20,930	24,983	4,052	19%	810	4%
5.13	Regional office - Maitland	6,554	8,048	1,494	23%	299	4%
5.14	Small industrial firm	1,190	1,494	305	26%	61	5%
5.15	Medium industrial firm with location-based charge	316,217	380,744	64,527	20%	12,905	4%
5.16	Large industrial firm with location-based charge and no sewer	394,378	546,229	151,851	39%	30,370	7%
5.17	Large industrial firm with location-based charge and sewer	542,523	712,477	169,953	31%	33,991	6%
5.18	Small nursery low discharge factor	1,867	2,181	314	17%	63	3%
5.19	Large nursery low discharge factor	15,529	18,347	2,819	18%	564	3%
5.20	Fast food outlet	3,566	4,392	826	23%	165	4%
5.21	Shopping centre with low strength trade waste	24,453	30,741	6,288	26%	1,258	5%
5.22	Shopping centre with high strength trade waste	33,729	48,631	14,902	44%	2,980	8%
5.23	Large industrial firm with high strength trade waste	160,679	195,175	34,496	21%	6,899	4%
5.24	Large industrial firm with high strength trade waste	48,456	68,566	20,110	42%	4,022	7%

Note: Annual inflation of 2.5% pa is assumed over the price period.
Source: Hunter Water analysis.

5.1 Bill impacts : House - including drainage

Charges: water, sewer, EIC, house drainage
Configuration: 185 kL p.a. / 20mm meter

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	442.15	456.95	473.60	490.25	508.75	525.40
Wastewater service	$nominal	651.98	692.48	735.21	780.62	828.51	879.35
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	80.01	86.75	94.09	102.06	110.70	120.09
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,316.22	1,339.11	1,406.42	1,479.34	1,555.03	1,634.86
% change on the previous year			1.7%	5.0%	5.2%	5.1%	5.1%
Water usage % of water charges		81%	82%	82%	82%	83%	83%
Water usage % of total bill		34%	34%	34%	33%	33%	32%

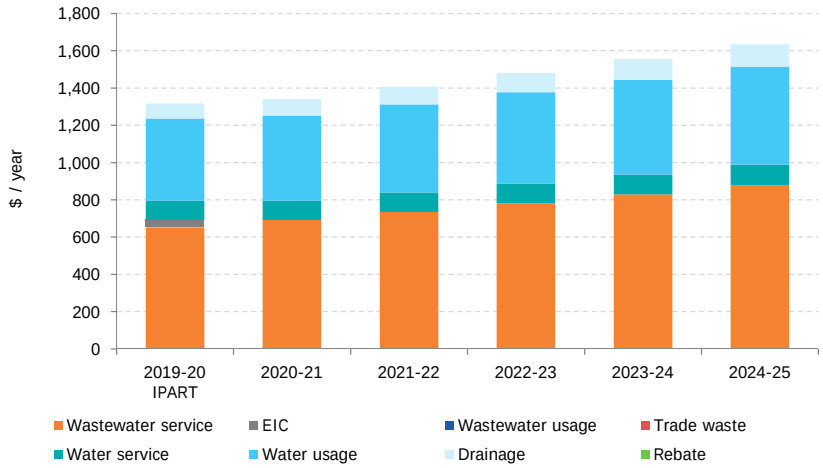
Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	442.15	525.40	83.25	16.65	0.32
Wastewater service	$nominal	651.98	879.35	227.37	45.47	0.87
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	80.01	120.09	40.08	8.02	0.15
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,316.22	1,634.86	318.64	63.73	1.23

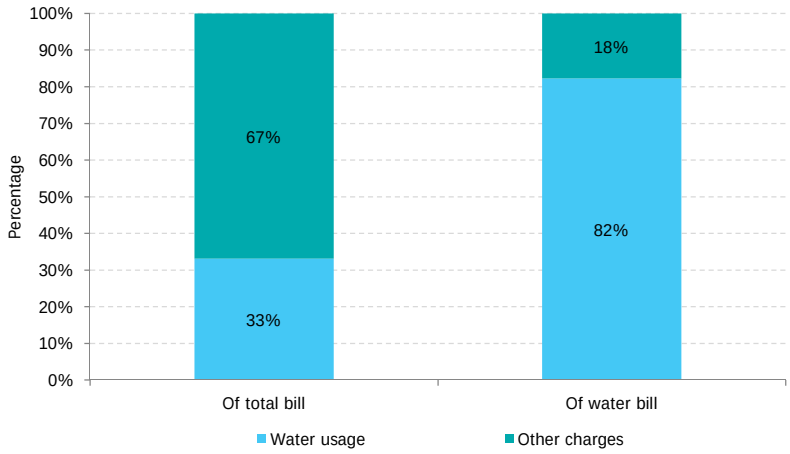
Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,316.
By 2024-25 this bill is projected to be $1,635, a change of $319 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 24.2%.
The annual average change in percentage terms is 4.4% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (Residential house meter connection charge x 0.75) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Stormwater drainage charges increase consistently across all customer types.

Projected annual bill ($nominal terms)



Average water usage component 2020 - 25



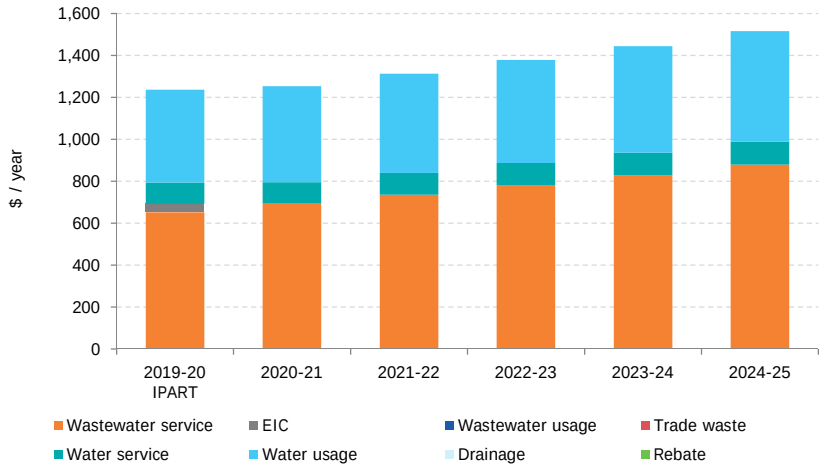
5.2 Bill impacts : House - excluding drainage

Charges: water, sewer, EIC
Configuration: 185 kL p.a. / 20mm meter

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	442.15	456.95	473.60	490.25	508.75	525.40
Wastewater service	$nominal	651.98	692.48	735.21	780.62	828.51	879.35
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,236.21	1,252.36	1,312.33	1,377.28	1,444.33	1,514.77
% change on the previous year			1.3%	4.8%	4.9%	4.9%	4.9%
Water usage % of water charges		81%	82%	82%	82%	83%	83%
Water usage % of total bill		36%	36%	36%	36%	35%	35%

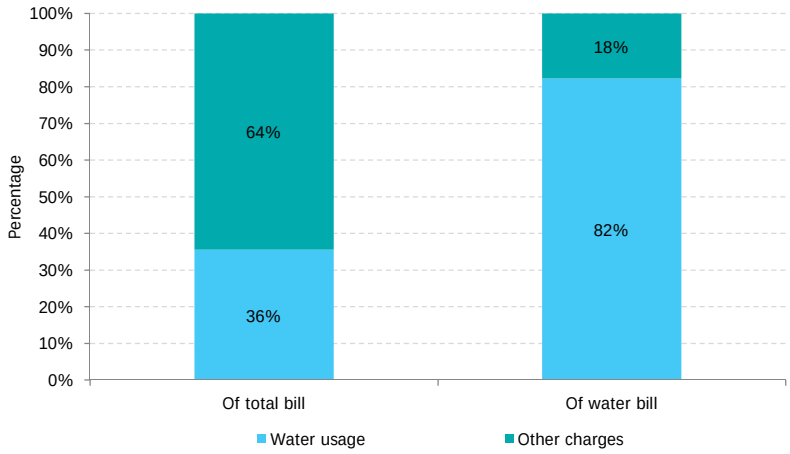
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	442.15	525.40	83.25	16.65	0.32
Wastewater service	$nominal	651.98	879.35	227.37	45.47	0.87
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,236.21	1,514.77	278.56	55.71	1.07

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,236.
By 2024-25 this bill is projected to be $1,515, a change of $279 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 22.5%.
The annual average change in percentage terms is 4.1% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (Residential house meter connection charge x 0.75) + deemed usage allowance
The EIC will no longer be charged after 2019-20.

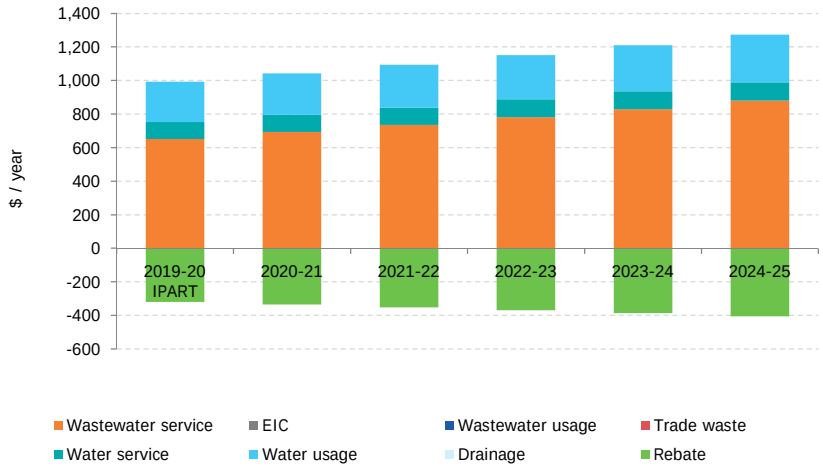
5.3 Bill impacts : Pensioner household - excluding drainage

Charges: water, sewer
Configuration: 100 kL p.a. / 20mm meter

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	239.00	247.00	256.00	265.00	275.00	284.00
Wastewater service	$nominal	651.98	692.48	735.21	780.62	828.51	879.35
EIC	$nominal	-	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	(320.02)	(335.25)	(351.19)	(368.43)	(386.25)	(404.92)
Projected total annual bill	$nominal	671.84	707.16	743.54	783.60	824.33	868.45
% change on the previous year			5.3%	5.1%	5.4%	5.2%	5.4%
Water usage % of water charges		70%	71%	71%	71%	72%	72%
Water usage % of total bill		36%	35%	34%	34%	33%	33%

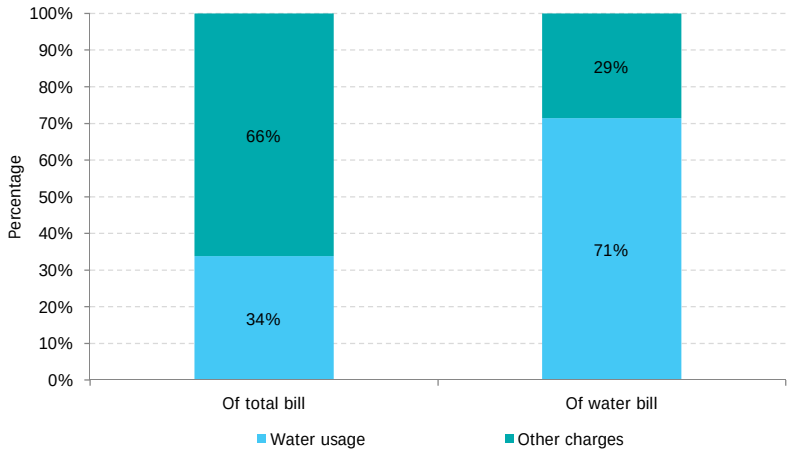
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	239.00	284.00	45.00	9.00	0.17
Wastewater service	$nominal	651.98	879.35	227.37	45.47	0.87
EIC	$nominal	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	(320.02)	(404.92)	(84.90)	(16.98)	(0.33)
Projected total annual bill	$nominal	671.84	868.45	196.61	39.32	0.76

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $672.
By 2024-25 this bill is projected to be $868, a change of $197 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 29.3%.
The annual average change in percentage terms is 5.3% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (Residential house meter connection charge x 0.75) + deemed usage allowance
The rebate increases in proportion to the bill.
Pensioners do not pay the EIC. The relative increase in pensioner bills therefore is slightly greater than a household bill because they do not benefit from the EIC reduction.
Pensioners that pay drainage charges will see a larger percentage increase over same period.

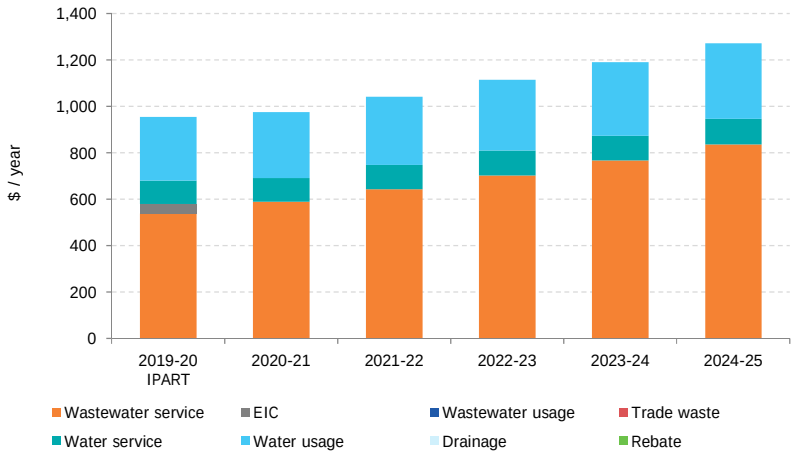
5.4 Bill impacts : Apartment - excluding drainage

Charges: water, sewer, EIC
Configuration: 115 kL p.a. / 20mm meter

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	274.85	284.05	294.40	304.75	316.25	326.60
Wastewater service	$nominal	537.89	588.61	643.31	702.56	766.37	835.38
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	954.82	975.59	1,041.23	1,113.72	1,189.69	1,272.00
% change on the previous year			2.2%	6.7%	7.0%	6.8%	6.9%
Water usage % of water charges		73%	73%	74%	74%	75%	75%
Water usage % of total bill		29%	29%	28%	27%	27%	26%

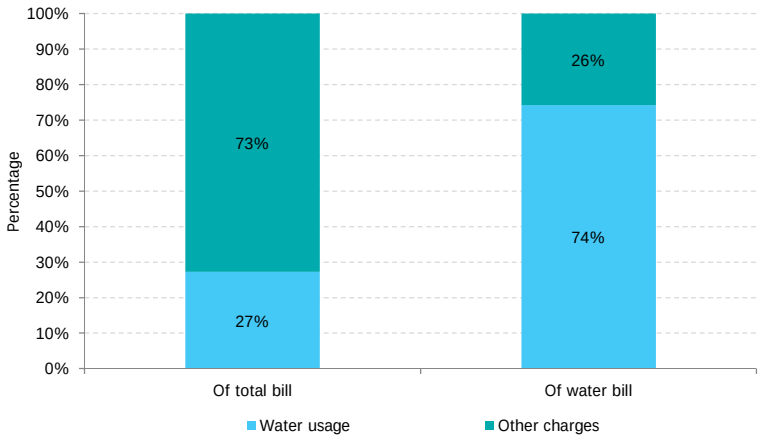
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	274.85	326.60	51.75	10.35	0.20
Wastewater service	$nominal	537.89	835.38	297.49	59.50	1.14
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	954.82	1,272.00	317.18	63.44	1.22

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $955.
By 2024-25 this bill is projected to be $1,272, a change of $317 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 33.2%.
The annual average change in percentage terms is 5.9% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
The relative increase in apartment bills is greater than a house bill because of the transition to a common wastewater service charge.
The apartment wastewater service charge is 82.5% of a house service charge in 2019-20. We propose the transition continues at an increase of 2.5% per annum such that a common residential wastewater service charge is reached in 2026-27.
Wastewater service charge = (Residential apartment meter connection charge x 0.75) + deemed usage allowance
The EIC will no longer be charged after 2019-20.

5.5 Bill impacts : Apartment - including drainage

Charges: water, sewer, EIC, apartment drainage
Configuration: 115 kL p.a. / 20mm meter

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	274.85	284.05	294.40	304.75	316.25	326.60
Wastewater service	$nominal	537.89	588.61	643.31	702.56	766.37	835.38
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	29.61	32.10	34.82	37.77	40.97	44.44
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	984.43	1,007.69	1,076.05	1,151.49	1,230.66	1,316.44
% change on the previous year			2.4%	6.8%	7.0%	6.9%	7.0%
Water usage % of water charges		73%	73%	74%	74%	75%	75%
Water usage % of total bill		28%	28%	27%	26%	26%	25%

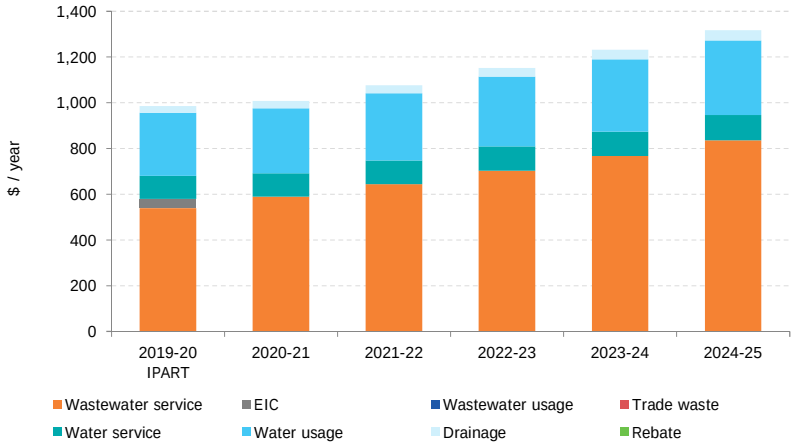
Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	274.85	326.60	51.75	10.35	0.20
Wastewater service	$nominal	537.89	835.38	297.49	59.50	1.14
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	29.61	44.44	14.83	2.97	0.06
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	984.43	1,316.44	332.01	66.40	1.28

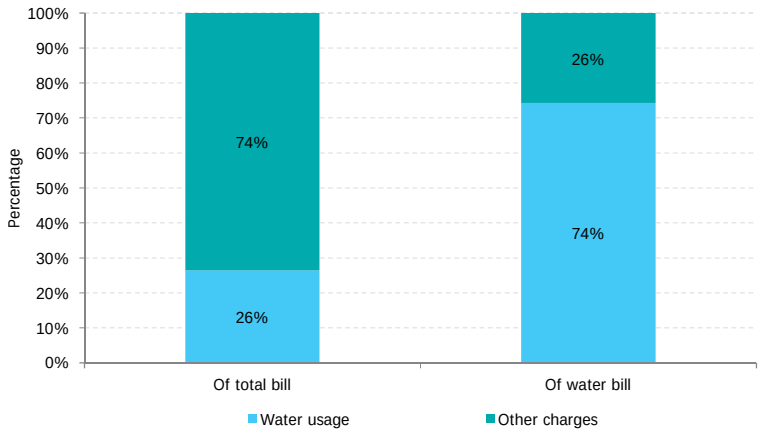
Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $984.
By 2024-25 this bill is projected to be $1,316, a change of $332 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 33.7%.
The annual average change in percentage terms is 6.0% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
The relative increase in apartment bills is greater than a house bill because of the transition to a common wastewater service charge.
The apartment wastewater service charge is 82.5% of a house service charge in 2019-20. We propose the transition continues at an increase of 2.5% per annum such that a common residential wastewater service charge is reached in 2026-27.
Wastewater service charge = (Residential apartment meter connection charge x 0.75) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Stormwater drainage charges increase consistently across all customer types.

Projected annual bill ($nominal terms)



Average water usage component 2020 - 25



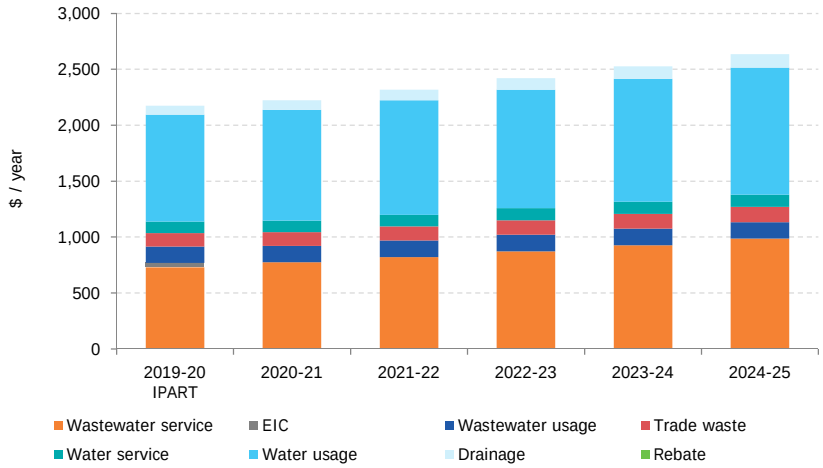
5.6 Bill impacts : Service station

Charges: water, sewer, minor trade waste, small non-res. drainage
Configuration: 400 kL p.a. / 20mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	956.00	988.00	1,024.00	1,060.00	1,100.00	1,136.00
Wastewater service	$nominal	728.19	774.15	822.48	874.02	928.20	985.91
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	147.40	147.40	147.40	147.40	147.40	147.40
Trade waste	$nominal	119.79	123.58	126.67	129.84	133.09	136.41
Drainage	$nominal	80.01	86.75	94.09	102.06	110.70	120.09
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	2,173.47	2,222.82	2,318.16	2,419.73	2,526.46	2,635.83
% change on the previous year			2.3%	4.3%	4.4%	4.4%	4.3%
Water usage % of water charges		90%	91%	91%	91%	91%	91%
Water usage % of total bill		44%	44%	44%	44%	44%	43%

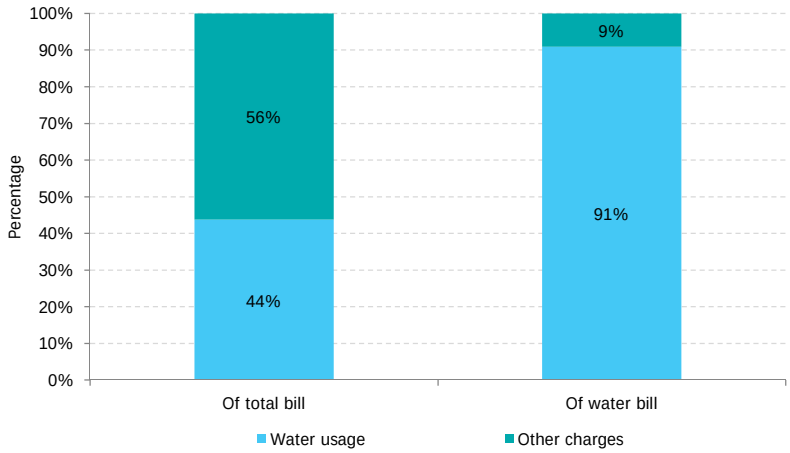
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	956.00	1,136.00	180.00	36.00	0.69
Wastewater service	$nominal	728.19	985.91	257.72	51.54	0.99
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	147.40	147.40	-	-	-
Trade waste	$nominal	119.79	136.41	16.62	3.32	0.06
Drainage	$nominal	80.01	120.09	40.08	8.02	0.15
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	2,173.47	2,635.83	462.36	92.47	1.78

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $2,173.
By 2024-25 this bill is projected to be $2,636, a change of $462 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 21.3%.
The annual average change in percentage terms is 3.9% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste minor annual agreement fee remains constant in real terms over the price period.
Stormwater drainage charges increase consistently across all customer types.

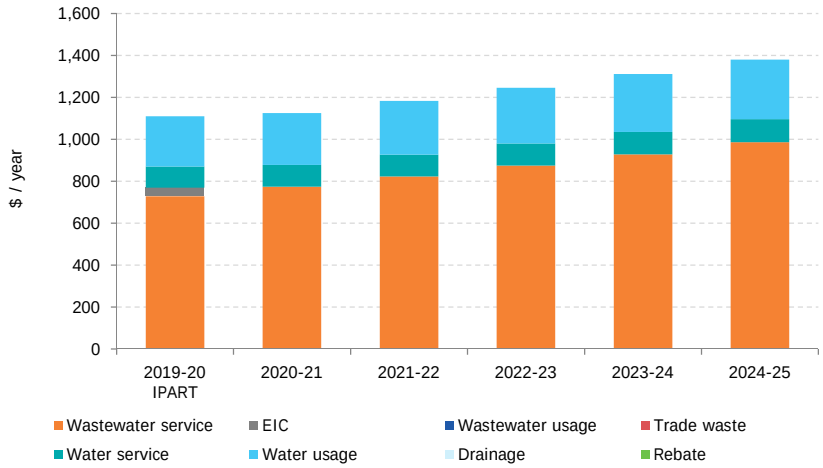
5.7 Bill impacts : Small shop - 20mm meter

Charges: water, sewer
Configuration: 100 kL p.a. / 20mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	239.00	247.00	256.00	265.00	275.00	284.00
Wastewater service	$nominal	728.19	774.15	822.48	874.02	928.20	985.91
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,109.27	1,124.08	1,182.00	1,245.43	1,310.27	1,379.93
% change on the previous year			1.3%	5.2%	5.4%	5.2%	5.3%
Water usage % of water charges		70%	71%	71%	71%	72%	72%
Water usage % of total bill		22%	22%	22%	21%	21%	21%

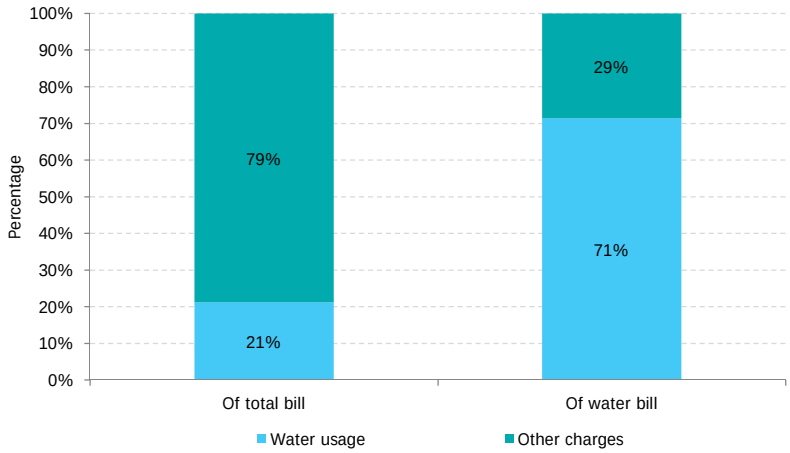
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	239.00	284.00	45.00	9.00	0.17
Wastewater service	$nominal	728.19	985.91	257.72	51.54	0.99
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,109.27	1,379.93	270.66	54.13	1.04

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,109.
By 2024-25 this bill is projected to be $1,380, a change of $271 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 24.4%.
The annual average change in percentage terms is 4.5% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge

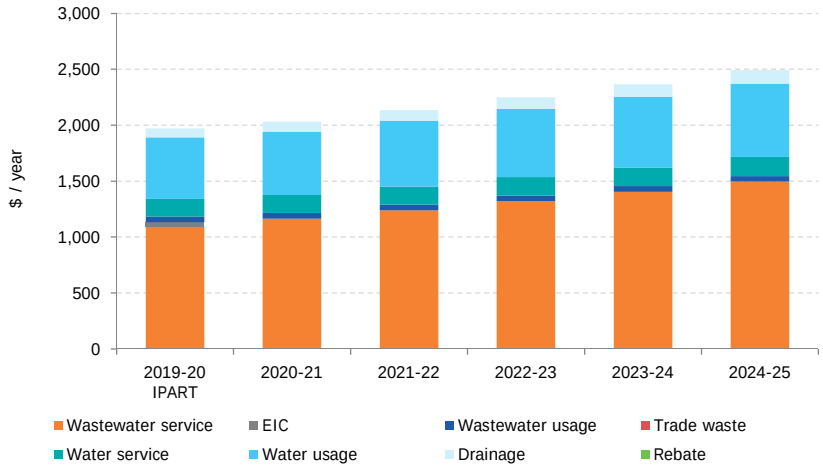
5.8 Bill impacts : Small shop - 25mm meter

Charges: water, sewer, small non-res. drainage
Configuration: 230 kL p.a. / 25mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	157.63	160.83	161.75	166.27	167.30	171.91
Water usage	$nominal	549.70	568.10	588.80	609.50	632.50	653.20
Wastewater service	$nominal	1,092.58	1,164.64	1,239.73	1,320.59	1,404.86	1,495.43
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	50.59	50.59	50.59	50.59	50.59	50.59
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	80.01	86.75	94.09	102.06	110.70	120.09
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,971.70	2,030.91	2,134.96	2,249.00	2,365.94	2,491.21
% change on the previous year			3.0%	5.1%	5.3%	5.2%	5.3%
Water usage % of water charges		78%	78%	78%	79%	79%	79%
Water usage % of total bill		28%	28%	28%	27%	27%	26%

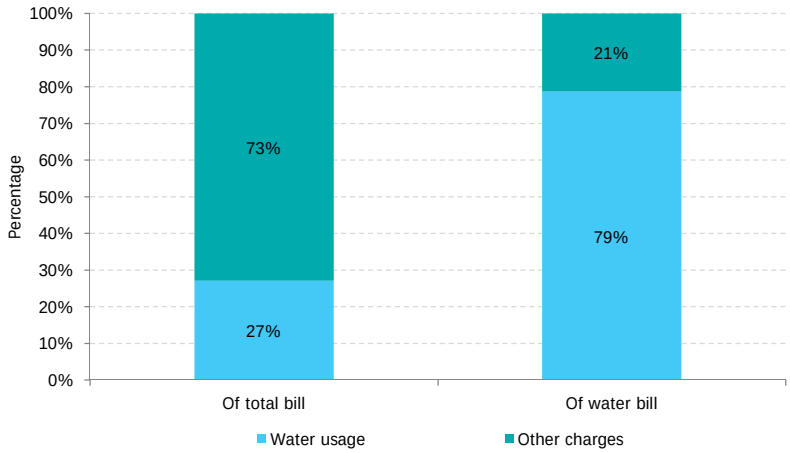
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	157.63	171.91	14.28	2.86	0.05
Water usage	$nominal	549.70	653.20	103.50	20.70	0.40
Wastewater service	$nominal	1,092.58	1,495.43	402.85	80.57	1.55
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	50.59	50.59	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	80.01	120.09	40.08	8.02	0.15
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,971.70	2,491.21	519.51	103.90	2.00

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,972.
By 2024-25 this bill is projected to be $2,491, a change of $520 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 26.3%.
The annual average change in percentage terms is 4.8% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Stormwater drainage charges increase consistently across all customer types.

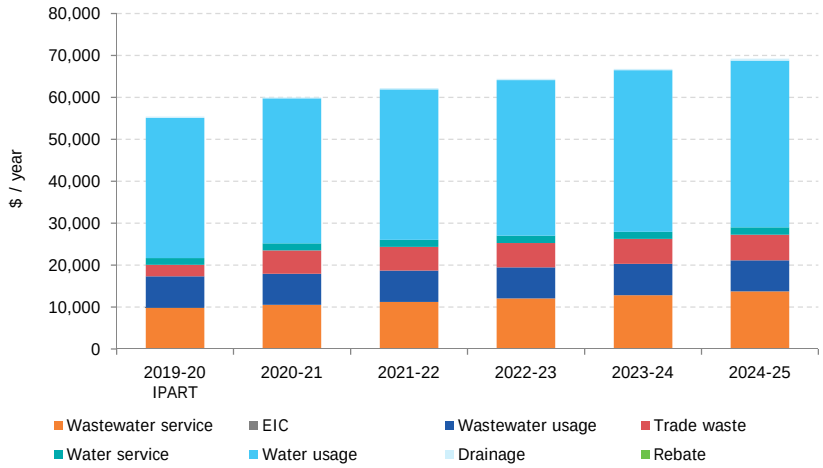
5.9 Bill impacts : Large licenced club

Charges: water, sewer, major trade waste, medium non-res. drainage
Configuration: 14,000 kL p.a. / 80mm meter / discharge factor 80%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	1,614.08	1,646.88	1,656.32	1,702.56	1,713.12	1,760.32
Water usage	$nominal	33,460.00	34,580.00	35,840.00	37,100.00	38,500.00	39,760.00
Wastewater service	$nominal	9,835.41	10,533.84	11,251.12	12,035.32	12,841.63	13,720.55
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	7,423.60	7,423.60	7,423.60	7,423.60	7,423.60	7,423.60
Trade waste	$nominal	2,747.86	5,536.50	5,674.91	5,816.78	5,962.20	6,111.26
Drainage	$nominal	261.31	283.30	307.30	333.33	361.56	392.19
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	55,383.45	60,004.12	62,153.25	64,411.59	66,802.12	69,167.92
% change on the previous year			8.3%	3.6%	3.6%	3.7%	3.5%
Water usage % of water charges		95%	95%	96%	96%	96%	96%
Water usage % of total bill		60%	58%	58%	58%	58%	57%

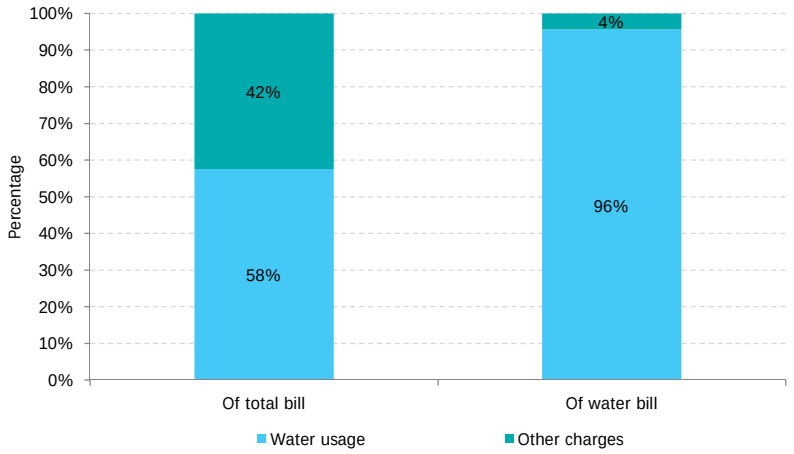
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	1,614.08	1,760.32	146.24	29.25	0.56
Water usage	$nominal	33,460.00	39,760.00	6,300.00	1,260.00	24.23
Wastewater service	$nominal	9,835.41	13,720.55	3,885.14	777.03	14.94
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	7,423.60	7,423.60	-	-	-
Trade waste	$nominal	2,747.86	6,111.26	3,363.40	672.68	12.94
Drainage	$nominal	261.31	392.19	130.88	26.18	0.50
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	55,383.45	69,167.92	13,784.46	2,756.89	53.02

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $55,383.
By 2024-25 this bill is projected to be $69,168, a change of $13,784 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 24.9%.
The annual average change in percentage terms is 4.5% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period and then remain constant.
Stormwater drainage charges increase consistently across all customer types.

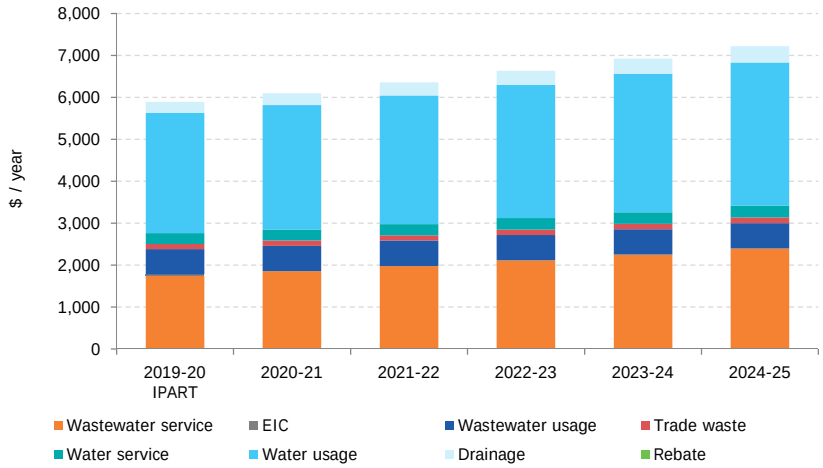
5.10 Bill impacts : Medium licenced hotel

Charges: water, sewer, minor trade waste, medium non-res. drainage
Configuration: 1,200 kL p.a. / 32mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	258.25	263.50	265.01	272.41	274.10	281.65
Water usage	$nominal	2,868.00	2,964.00	3,072.00	3,180.00	3,300.00	3,408.00
Wastewater service	$nominal	1,738.75	1,857.11	1,979.66	2,112.50	2,250.14	2,398.98
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	603.00	603.00	603.00	603.00	603.00	603.00
Trade waste	$nominal	119.79	123.58	126.67	129.84	133.09	136.41
Drainage	$nominal	261.31	283.30	307.30	333.33	361.56	392.19
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	5,890.30	6,094.50	6,353.65	6,631.08	6,921.89	7,220.23
% change on the previous year			3.5%	4.3%	4.4%	4.4%	4.3%
Water usage % of water charges		92%	92%	92%	92%	92%	92%
Water usage % of total bill		49%	49%	48%	48%	48%	47%

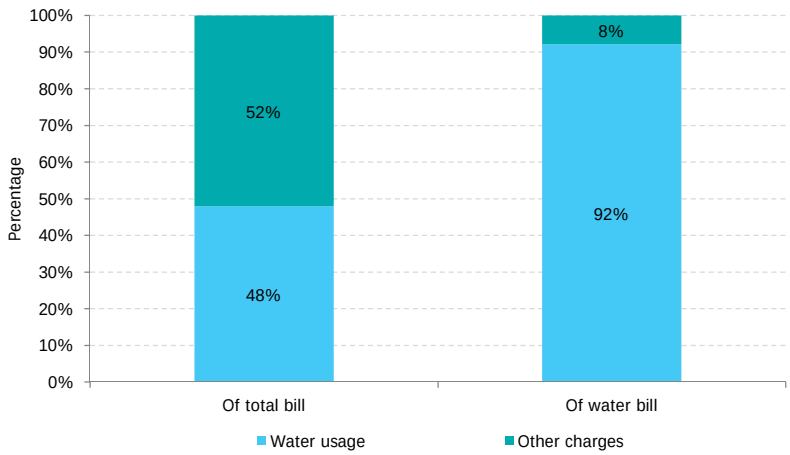
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	258.25	281.65	23.40	4.68	0.09
Water usage	$nominal	2,868.00	3,408.00	540.00	108.00	2.08
Wastewater service	$nominal	1,738.75	2,398.98	660.22	132.04	2.54
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	603.00	603.00	-	-	-
Trade waste	$nominal	119.79	136.41	16.62	3.32	0.06
Drainage	$nominal	261.31	392.19	130.88	26.18	0.50
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	5,890.30	7,220.23	1,329.93	265.99	5.12

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $5,890.
By 2024-25 this bill is projected to be $7,220, a change of $1,330 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 22.6%.
The annual average change in percentage terms is 4.2% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste minor annual agreement fee remains constant in real terms over the price period.
Stormwater drainage charges increase consistently across all customer types.

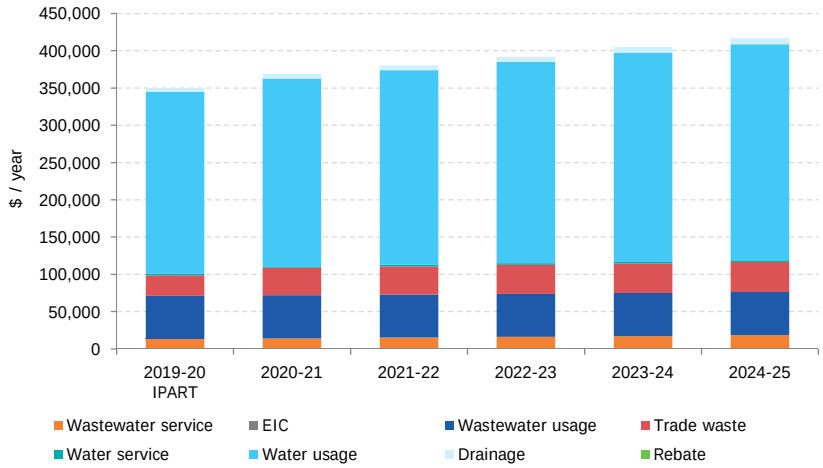
5.11 Bill impacts : Regional shopping centre

Charges: water, sewer, major trade waste, very large non-res. drainage
Configuration: 102,000 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	2,017.60	2,058.60	2,070.40	2,128.20	2,141.40	2,200.40
Water usage	$nominal	243,780.00	251,940.00	261,120.00	270,300.00	280,500.00	289,680.00
Wastewater service	$nominal	13,357.87	14,283.82	15,239.18	16,278.60	17,351.98	18,516.72
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	57,687.00	57,687.00	57,687.00	57,687.00	57,687.00	57,687.00
Trade waste	$nominal	27,555.90	36,858.75	37,780.22	38,724.73	39,692.85	40,685.17
Drainage	$nominal	5,280.39	5,724.78	6,209.74	6,735.75	7,306.26	7,925.06
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	349,719.96	368,552.95	380,106.54	391,854.28	404,679.49	416,694.35
% change on the previous year			5.4%	3.1%	3.1%	3.3%	3.0%
Water usage % of water charges		99%	99%	99%	99%	99%	99%
Water usage % of total bill		70%	68%	69%	69%	69%	70%

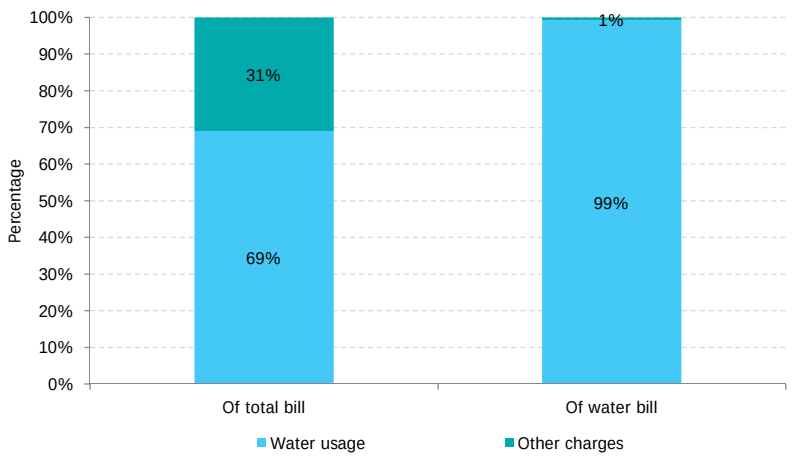
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	2,017.60	2,200.40	182.80	36.56	0.70
Water usage	$nominal	243,780.00	289,680.00	45,900.00	9,180.00	176.54
Wastewater service	$nominal	13,357.87	18,516.72	5,158.85	1,031.77	19.84
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	57,687.00	57,687.00	-	-	-
Trade waste	$nominal	27,555.90	40,685.17	13,129.27	2,625.85	50.50
Drainage	$nominal	5,280.39	7,925.06	2,644.67	528.93	10.17
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	349,719.96	416,694.35	66,974.39	13,394.88	257.59

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $349,720.
By 2024-25 this bill is projected to be $416,694, a change of $66,974 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 19.2%.
The annual average change in percentage terms is 3.6% per annum.
The customer has five meters - four 20mm and a 80mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period and then remain constant.
Stormwater drainage charges increase consistently across all customer types.

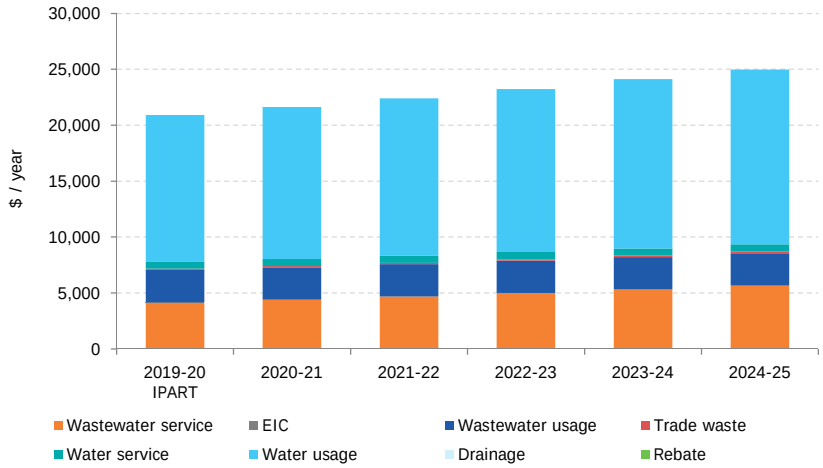
5.12 Bill impacts : Large office - Newcastle

Charges: water, sewer, minor trade waste
Configuration: 5,500 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	605.28	617.58	621.12	638.46	642.42	660.12
Water usage	$nominal	13,145.00	13,585.00	14,080.00	14,575.00	15,125.00	15,620.00
Wastewater service	$nominal	4,127.96	4,405.07	4,692.79	5,003.76	5,326.79	5,675.17
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	2,891.05	2,891.05	2,891.05	2,891.05	2,891.05	2,891.05
Trade waste	$nominal	119.79	123.58	126.67	129.84	133.09	136.41
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	20,930.28	21,622.29	22,411.63	23,238.11	24,118.35	24,982.75
% change on the previous year			3.3%	3.7%	3.7%	3.8%	3.6%
Water usage % of water charges		96%	96%	96%	96%	96%	96%
Water usage % of total bill		63%	63%	63%	63%	63%	63%

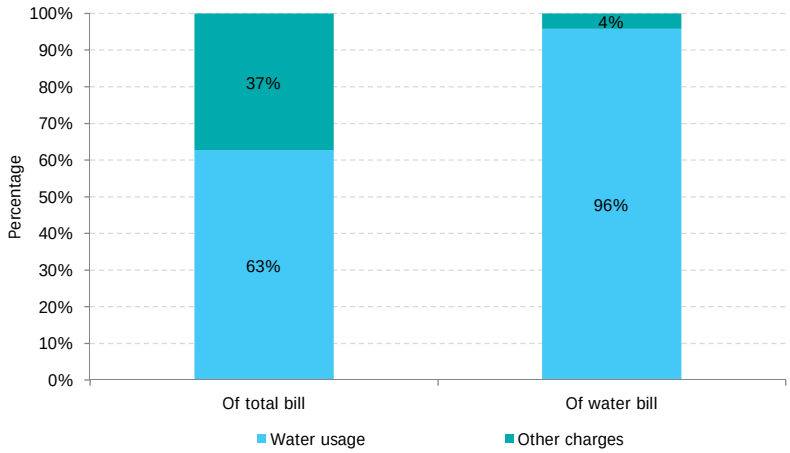
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	605.28	660.12	54.84	10.97	0.21
Water usage	$nominal	13,145.00	15,620.00	2,475.00	495.00	9.52
Wastewater service	$nominal	4,127.96	5,675.17	1,547.21	309.44	5.95
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	2,891.05	2,891.05	-	-	-
Trade waste	$nominal	119.79	136.41	16.62	3.32	0.06
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	20,930.28	24,982.75	4,052.47	810.49	15.59

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $20,930.
By 2024-25 this bill is projected to be $24,983, a change of $4,052 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 19.4%.
The annual average change in percentage terms is 3.6% per annum.
The customer has three meters - two 20mm and a 40mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste minor annual agreement fee remains constant in real terms over the price period.

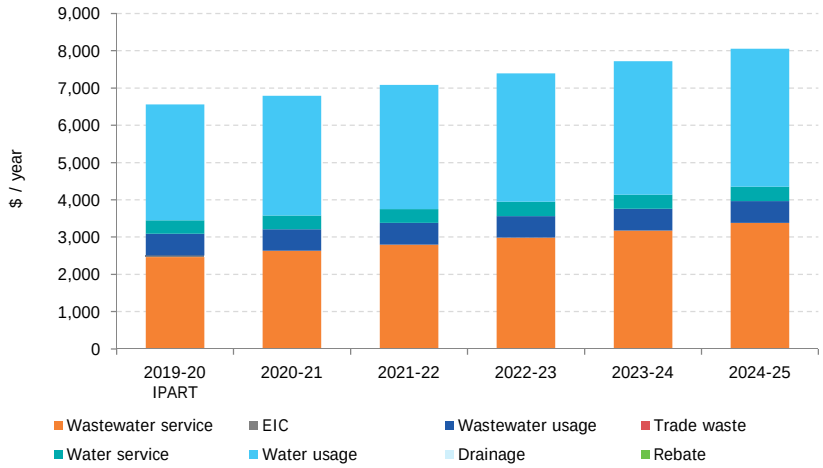
5.13 Bill impacts : Regional office - Maitland

Charges: water, sewer
Configuration: 1,300 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	359.13	366.43	368.53	378.82	381.17	391.67
Water usage	$nominal	3,107.00	3,211.00	3,328.00	3,445.00	3,575.00	3,692.00
Wastewater service	$nominal	2,466.94	2,631.26	2,802.14	2,986.52	3,178.34	3,384.89
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	579.55	579.55	579.55	579.55	579.55	579.55
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	6,553.83	6,788.25	7,078.22	7,389.89	7,714.06	8,048.11
% change on the previous year			3.6%	4.3%	4.4%	4.4%	4.3%
Water usage % of water charges		90%	90%	90%	90%	90%	90%
Water usage % of total bill		47%	47%	47%	47%	46%	46%

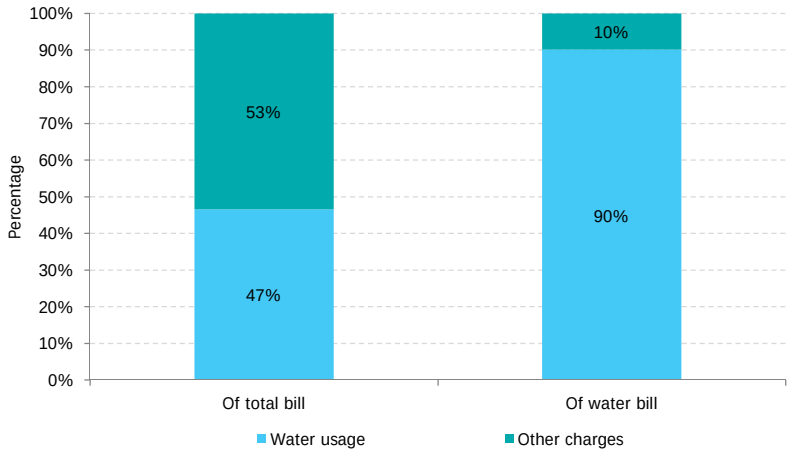
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	359.13	391.67	32.54	6.51	0.13
Water usage	$nominal	3,107.00	3,692.00	585.00	117.00	2.25
Wastewater service	$nominal	2,466.94	3,384.89	917.94	183.59	3.53
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	579.55	579.55	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	6,553.83	8,048.11	1,494.28	298.86	5.75

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $6,554.
By 2024-25 this bill is projected to be $8,048, a change of $1,494 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 22.8%.
The annual average change in percentage terms is 4.2% per annum.
The customer has two meters - a 20mm and a 32mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge.

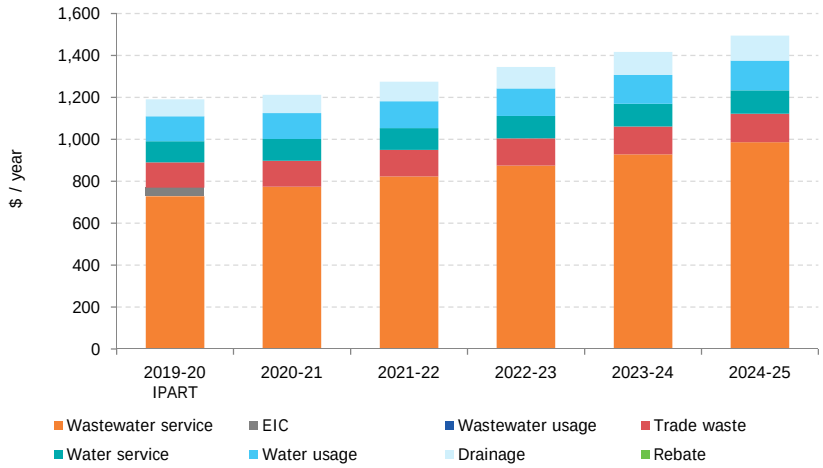
5.14 Bill impacts : Small industrial firm

Charges: water, sewer, minor trade waste, small non-res. drainage
Configuration: 50 kL p.a. / 20mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	119.50	123.50	128.00	132.50	137.50	142.00
Wastewater service	$nominal	728.19	774.15	822.48	874.02	928.20	985.91
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	119.79	123.58	126.67	129.84	133.09	136.41
Drainage	$nominal	80.01	86.75	94.09	102.06	110.70	120.09
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,189.57	1,210.92	1,274.76	1,344.83	1,416.56	1,494.43
% change on the previous year			1.8%	5.3%	5.5%	5.3%	5.5%
Water usage % of water charges		54%	55%	55%	55%	56%	56%
Water usage % of total bill		10%	10%	10%	10%	10%	10%

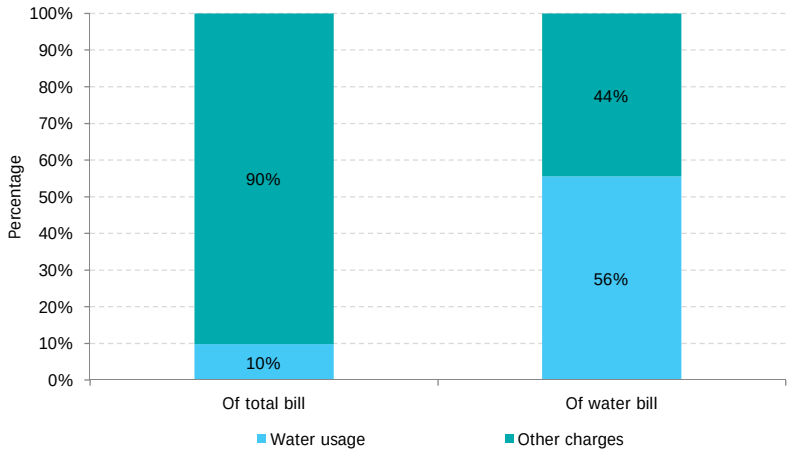
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	119.50	142.00	22.50	4.50	0.09
Wastewater service	$nominal	728.19	985.91	257.72	51.54	0.99
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	119.79	136.41	16.62	3.32	0.06
Drainage	$nominal	80.01	120.09	40.08	8.02	0.15
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,189.57	1,494.43	304.86	60.97	1.17

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,190.
By 2024-25 this bill is projected to be $1,494, a change of $305 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 25.6%.
The annual average change in percentage terms is 4.7% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste minor annual agreement fee remains cosntant in real terms over the price period.
Stormwater drainage charges increase consistently across all customer types.

5.15 Bill impacts : Medium industrial firm

Charges: water: location-based charge, sewer, major trade waste, medium non-res. drainage
Configuration: 110,000 kL p.a. / Multiple meters / discharge factor 60%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	2,780.51	2,837.01	2,853.27	2,932.93	2,951.12	3,032.43
Water usage	$nominal	255,700.00	266,300.00	277,400.00	288,500.00	300,700.00	312,400.00
Wastewater service	$nominal	12,844.59	13,746.19	14,674.18	15,686.39	16,729.30	17,863.65
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	43,978.80	43,978.80	43,978.80	43,978.80	43,978.80	43,978.80
Trade waste	$nominal	871.65	3,142.42	3,220.99	3,301.51	3,384.05	3,468.65
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	316,216.75	330,004.42	342,127.24	354,399.62	367,743.26	380,743.53
% change on the previous year			4.4%	3.7%	3.6%	3.8%	3.5%
Water usage % of water charges		99%	99%	99%	99%	99%	99%
Water usage % of total bill		81%	81%	81%	81%	82%	82%

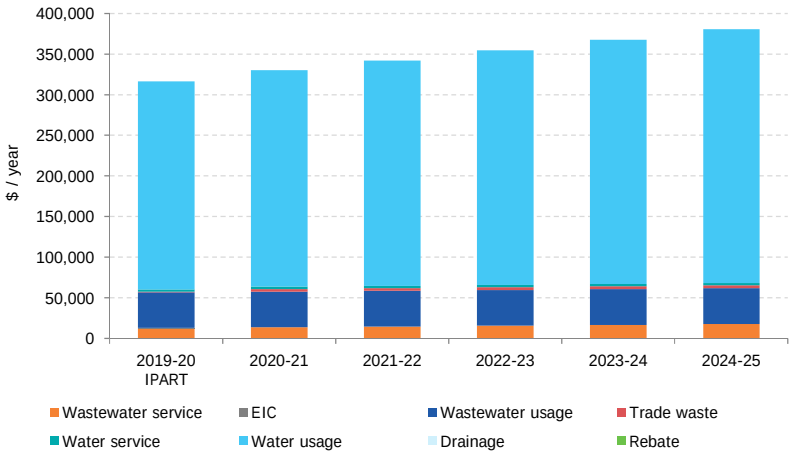
Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	2,780.51	3,032.43	251.92	50.38	0.97
Water usage	$nominal	255,700.00	312,400.00	56,700.00	11,340.00	218.08
Wastewater service	$nominal	12,844.59	17,863.65	5,019.06	1,003.81	19.30
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	43,978.80	43,978.80	-	-	-
Trade waste	$nominal	871.65	3,468.65	2,596.99	519.40	9.99
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	316,216.75	380,743.53	64,526.77	12,905.35	248.18

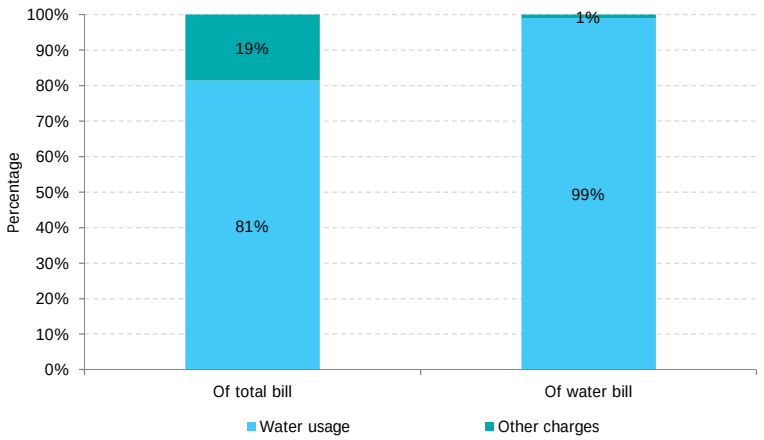
Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $316,217.
By 2024-25 this bill is projected to be $380,744, a change of $64,527 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 20.4%.
The annual average change in percentage terms is 3.8% per annum.
The customer has three meters - a 20mm, a 25mm and a 100mm.
We propose to transition location-based water usage charges to equal the base water usage charge. This increases the annual average change in the typical bill by approximately 0.5%.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period and then remain constant.
Stormwater drainage charges increase consistently across all customer types.

Projected annual bill ($nominal terms)



Average water usage component 2020 - 25



5.16 Bill impacts : Large industrial firm no sewer

Charges: water: location-based charge
Configuration: 190,000 kL p.a. / Multiple meters

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	6,078.02	6,201.53	6,237.08	6,411.20	6,450.97	6,628.71
Water usage	$nominal	388,300.00	416,100.00	445,800.00	474,100.00	507,100.00	539,600.00
Wastewater service	$nominal	-	-	-	-	-	-
EIC	$nominal	-	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	394,378.02	422,301.53	452,037.08	480,511.20	513,550.97	546,228.71
% change on the previous year			7.1%	7.0%	6.3%	6.9%	6.4%
Water usage % of water charges		98%	99%	99%	99%	99%	99%
Water usage % of total bill		98%	99%	99%	99%	99%	99%

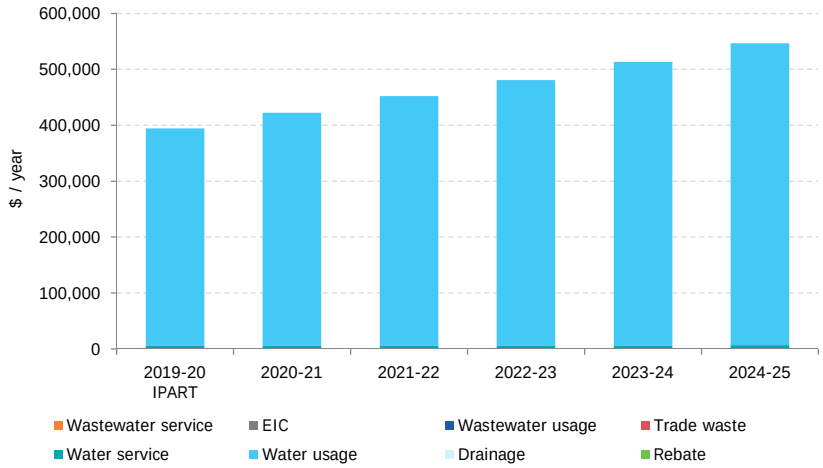
Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	6,078.02	6,628.71	550.68	110.14	2.12
Water usage	$nominal	388,300.00	539,600.00	151,300.00	30,260.00	581.92
Wastewater service	$nominal	-	-	-	-	-
EIC	$nominal	-	-	-	-	-
Wastewater usage	$nominal	-	-	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	394,378.02	546,228.71	151,850.69	30,370.14	584.04

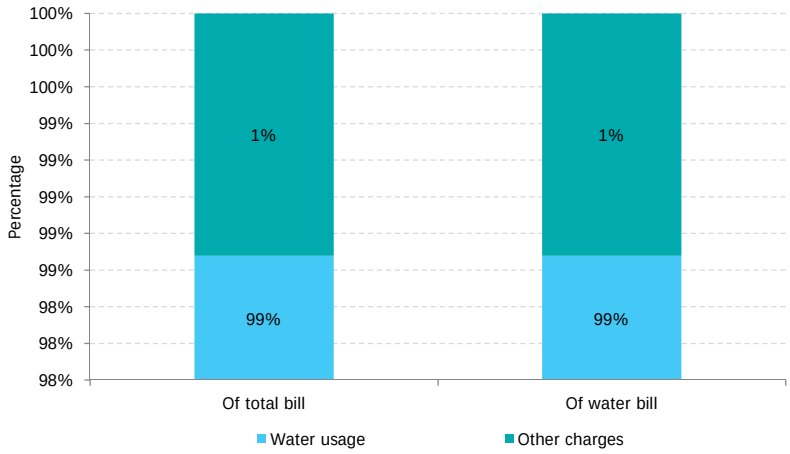
Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $394,378.
By 2024-25 this bill is projected to be $546,229, a change of $151,851 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 38.5%.
The annual average change in percentage terms is 6.7% per annum.
The customer has two meters - a 40mm, and a 150mm.
We propose to transition location-based water usage charges to equal the base water usage charge. This increases the annual average change in the typical bill by approximately 3.2%.
Stormwater drainage charges increase consistently across all customer types.

Projected annual bill ($nominal terms)



Average water usage component 2020 - 25



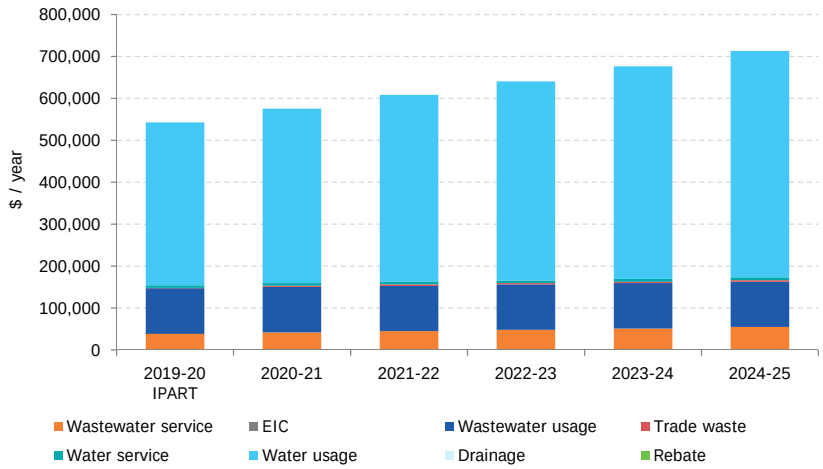
5.17 Bill impacts : Large industrial firm with sewer

Charges: water: location-based charge, sewer, major trade waste
Configuration: 190,000 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	6,078.02	6,201.53	6,237.08	6,411.20	6,450.97	6,628.71
Water usage	$nominal	388,300.00	416,100.00	445,800.00	474,100.00	507,100.00	539,600.00
Wastewater service	$nominal	39,190.36	41,985.66	44,854.02	47,992.72	51,217.39	54,735.31
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	108,044.20	108,044.20	108,044.20	108,044.20	108,044.20	108,044.20
Trade waste	$nominal	869.64	3,142.42	3,220.99	3,301.51	3,384.05	3,468.65
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	542,523.42	575,473.82	608,156.28	639,849.63	676,196.60	712,476.87
% change on the previous year			6.1%	5.7%	5.2%	5.7%	5.4%
Water usage % of water charges		98%	99%	99%	99%	99%	99%
Water usage % of total bill		72%	72%	73%	74%	75%	76%

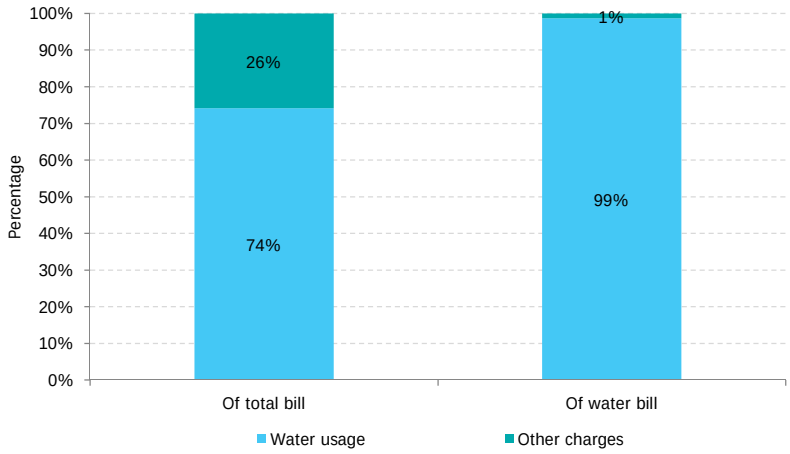
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	6,078.02	6,628.71	550.68	110.14	2.12
Water usage	$nominal	388,300.00	539,600.00	151,300.00	30,260.00	581.92
Wastewater service	$nominal	39,190.36	54,735.31	15,544.95	3,108.99	59.79
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	108,044.20	108,044.20	-	-	-
Trade waste	$nominal	869.64	3,468.65	2,599.01	519.80	10.00
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	542,523.42	712,476.87	169,953.45	33,990.69	653.67

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $542,523.
By 2024-25 this bill is projected to be $712,477, a change of $169,953 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 31.3%.
The annual average change in percentage terms is 5.6% per annum.
The customer has two meters - a 40mm, and a 150mm.
We propose to transition location-based water usage charges to equal the base water usage charge. This increases the annual average change in the typical bill by approximately 2.4%.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period and then remain constant.

5.18 Bill impacts : Small nursery - low discharge factor

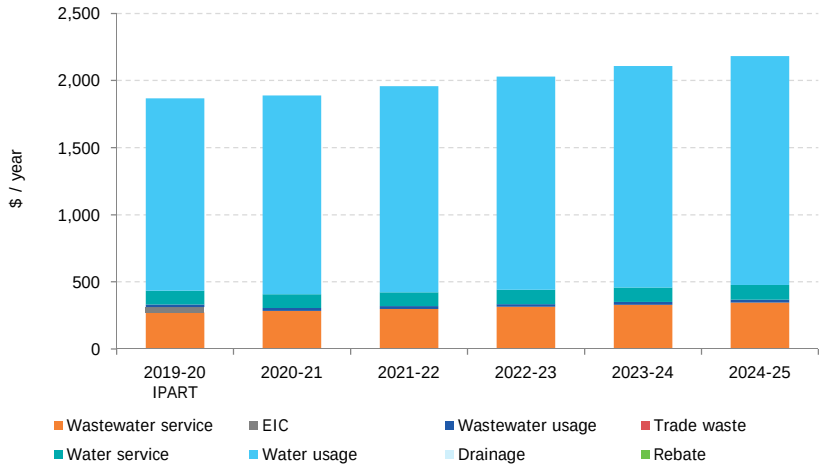
Charges: water, sewer

Configuration: 600 kL p.a. / 20mm meter / discharge factor 25%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	100.88	102.93	103.52	106.41	107.07	110.02
Water usage	$nominal	1,434.00	1,482.00	1,536.00	1,590.00	1,650.00	1,704.00
Wastewater service	$nominal	270.93	284.13	298.86	313.62	330.04	346.52
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	20.10	20.10	20.10	20.10	20.10	20.10
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	1,867.11	1,889.16	1,958.48	2,030.13	2,107.21	2,180.64
% change on the previous year			1.2%	3.7%	3.7%	3.8%	3.5%
Water usage % of water charges		93%	94%	94%	94%	94%	94%
Water usage % of total bill		77%	78%	78%	78%	78%	78%

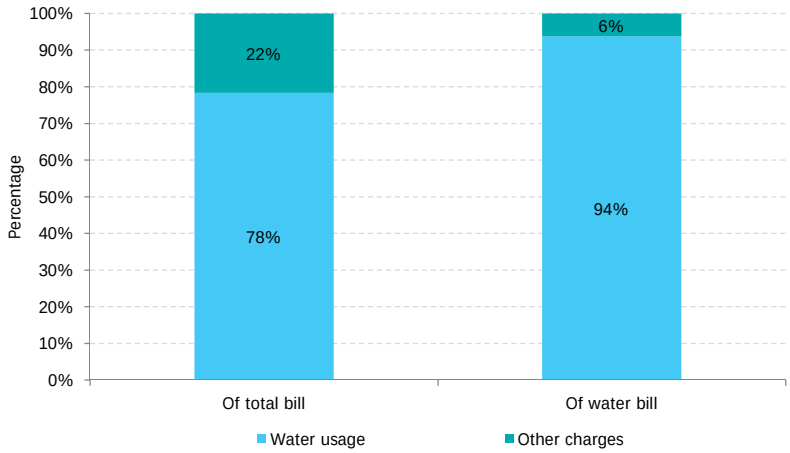
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	100.88	110.02	9.14	1.83	0.04
Water usage	$nominal	1,434.00	1,704.00	270.00	54.00	1.04
Wastewater service	$nominal	270.93	346.52	75.59	15.12	0.29
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	20.10	20.10	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	1,867.11	2,180.64	313.53	62.71	1.21

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $1,867.
By 2024-25 this bill is projected to be $2,181, a change of $314 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 16.8%.
The annual average change in percentage terms is 3.2% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
The customer has low bill increases relative to other customers. This is due to the large proportion of the bill related to water services. This product had the lowest increase in target revenues.

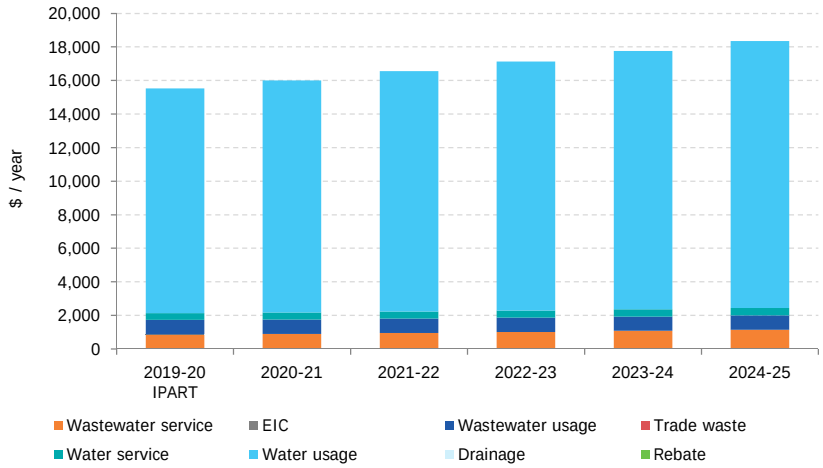
5.19 Bill impacts : Large nursery - low discharge factor

Charges: water, sewer
Configuration: 5,600 kL p.a. / 40mm meter / discharge factor 25%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	403.52	411.72	414.08	425.64	428.28	440.08
Water usage	$nominal	13,384.00	13,832.00	14,336.00	14,840.00	15,400.00	15,904.00
Wastewater service	$nominal	842.51	896.66	953.38	1,014.12	1,077.74	1,145.76
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	857.60	857.60	857.60	857.60	857.60	857.60
Trade waste	$nominal	-	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	15,528.83	15,997.98	16,561.06	17,137.36	17,763.62	18,347.44
% change on the previous year			3.0%	3.5%	3.5%	3.7%	3.3%
Water usage % of water charges		97%	97%	97%	97%	97%	97%
Water usage % of total bill		86%	86%	87%	87%	87%	87%

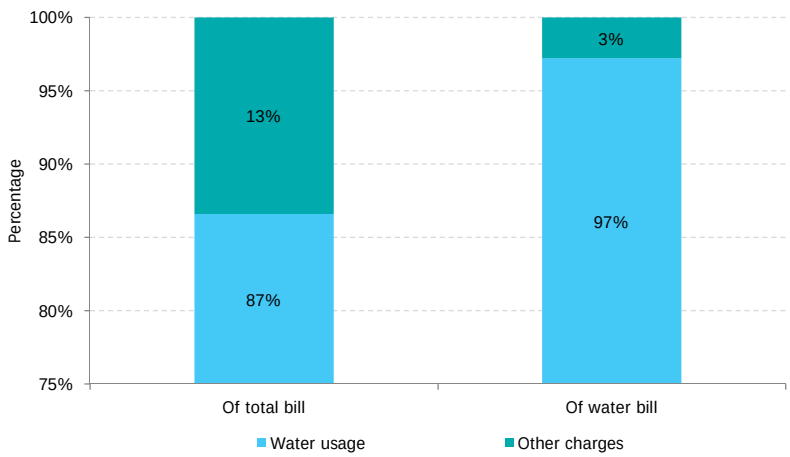
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	403.52	440.08	36.56	7.31	0.14
Water usage	$nominal	13,384.00	15,904.00	2,520.00	504.00	9.69
Wastewater service	$nominal	842.51	1,145.76	303.25	60.65	1.17
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	857.60	857.60	-	-	-
Trade waste	$nominal	-	-	-	-	-
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	15,528.83	18,347.44	2,818.61	563.72	10.84

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $15,529.
By 2024-25 this bill is projected to be $18,347, a change of $2,819 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 18.2%.
The annual average change in percentage terms is 3.4% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
The customer has low bill increases relative to other customers. This is due to the large proportion of the bill related to water services. This product had the lowest increase in target revenues.

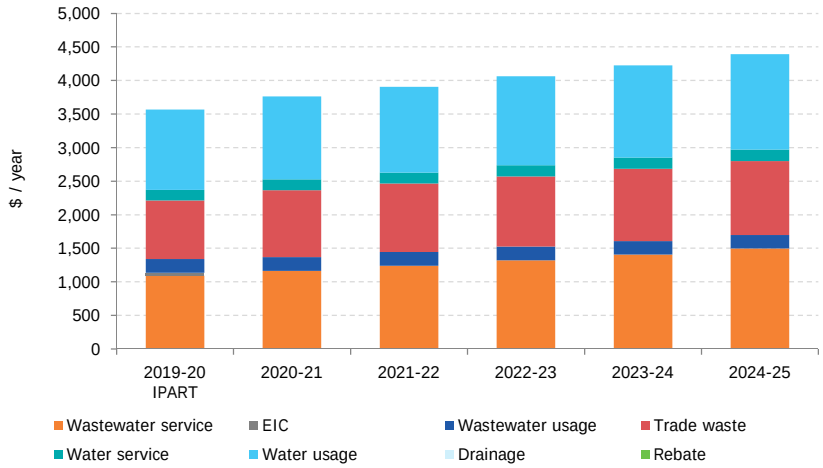
5.20 Bill impacts : Fast food outlet

Charges: water, sewer, moderate trade waste
Configuration: 500 kL p.a. / 25mm meter / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	157.63	160.83	161.75	166.27	167.30	171.91
Water usage	$nominal	1,195.00	1,235.00	1,280.00	1,325.00	1,375.00	1,420.00
Wastewater service	$nominal	1,092.58	1,164.64	1,239.73	1,320.59	1,404.86	1,495.43
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	204.35	204.35	204.35	204.35	204.35	204.35
Trade waste	$nominal	875.70	996.82	1,021.74	1,047.28	1,073.47	1,100.30
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	3,566.45	3,761.64	3,907.57	4,063.49	4,224.97	4,391.99
% change on the previous year			5.5%	3.9%	4.0%	4.0%	4.0%
Water usage % of water charges		88%	88%	89%	89%	89%	89%
Water usage % of total bill		34%	33%	33%	33%	33%	32%

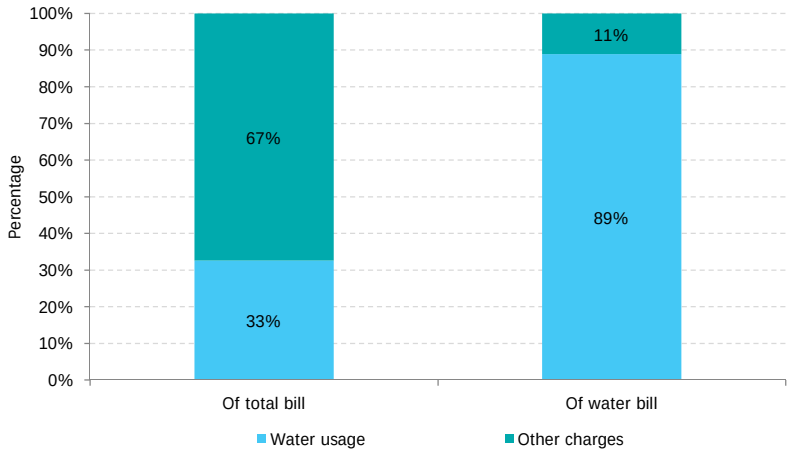
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	157.63	171.91	14.28	2.86	0.05
Water usage	$nominal	1,195.00	1,420.00	225.00	45.00	0.87
Wastewater service	$nominal	1,092.58	1,495.43	402.85	80.57	1.55
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	204.35	204.35	-	-	-
Trade waste	$nominal	875.70	1,100.30	224.60	44.92	0.86
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	3,566.45	4,391.99	825.54	165.11	3.18

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $3,566.
By 2024-25 this bill is projected to be $4,392, a change of $826 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 23.1%.
The annual average change in percentage terms is 4.3% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste moderate annual agreement fee decreases at the start of the price period. The customer now pays high strength charges based on actual discharge, rather than a deemed average strength being included in the annual agreement fee.

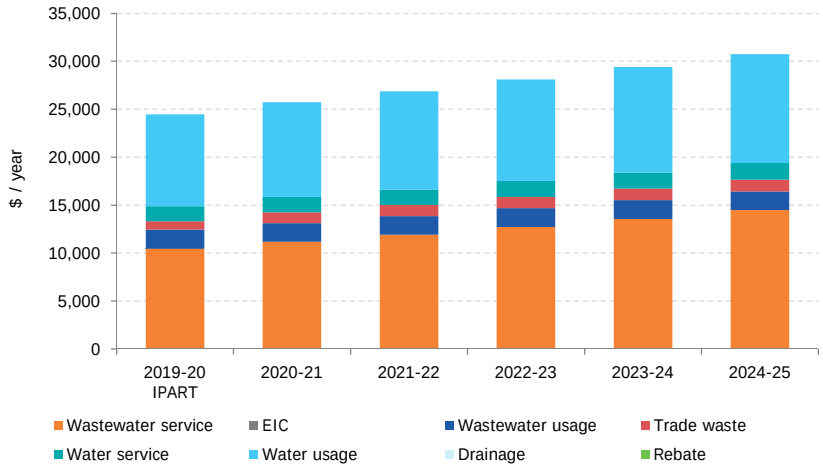
5.21 Bill impacts : Shopping centre with low strength trade waste

Charges: water, sewer, moderate trade waste
Configuration: 4,000 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	1,576.25	1,608.28	1,617.50	1,662.66	1,672.97	1,719.06
Water usage	$nominal	9,560.00	9,880.00	10,240.00	10,600.00	11,000.00	11,360.00
Wastewater service	$nominal	10,443.37	11,166.73	11,913.17	12,725.17	13,563.81	14,473.70
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	1,956.40	1,956.40	1,956.40	1,956.40	1,956.40	1,956.40
Trade waste	$nominal	875.70	1,115.88	1,143.77	1,172.37	1,201.68	1,231.72
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	24,452.92	25,727.29	26,870.85	28,116.59	29,394.86	30,740.88
% change on the previous year			5.2%	4.4%	4.6%	4.5%	4.6%
Water usage % of water charges		86%	86%	86%	86%	87%	87%
Water usage % of total bill		39%	38%	38%	38%	37%	37%

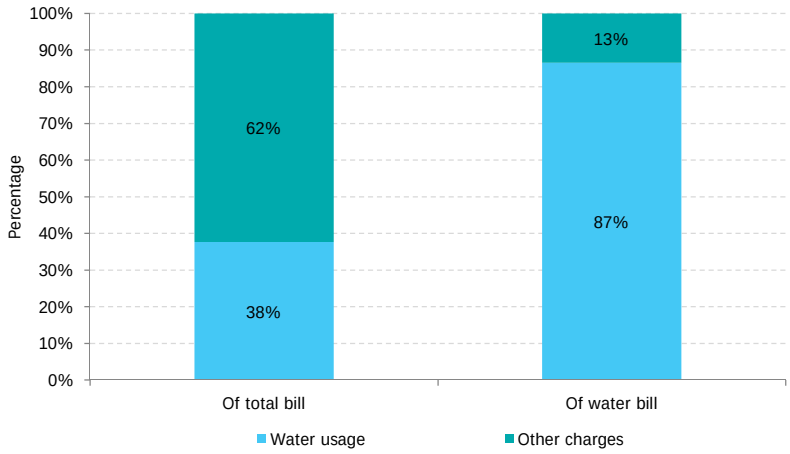
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	1,576.25	1,719.06	142.81	28.56	0.55
Water usage	$nominal	9,560.00	11,360.00	1,800.00	360.00	6.92
Wastewater service	$nominal	10,443.37	14,473.70	4,030.32	806.06	15.50
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	1,956.40	1,956.40	-	-	-
Trade waste	$nominal	875.70	1,231.72	356.02	71.20	1.37
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	24,452.92	30,740.88	6,287.95	1,257.59	24.18

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $24,453.
By 2024-25 this bill is projected to be $30,741, a change of $6,288 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 25.7%.
The annual average change in percentage terms is 4.7% per annum.
The customer has four meters - two 25mm, and two 50mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste moderate annual agreement fee decreases at the start of the price period. The customer now pays high strength charges based on actual discharge, rather than a deemed average strength being included in the annual agreement fee.

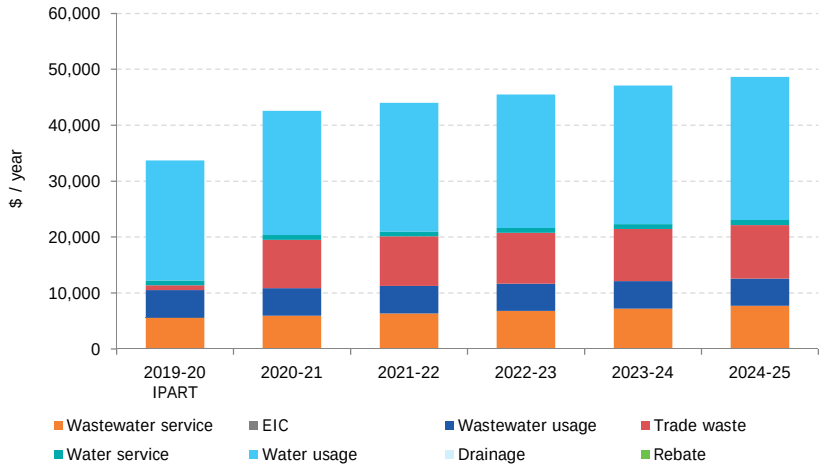
5.22 Bill impacts : Shopping centre with high strength trade waste

Charges: water, sewer, moderate trade waste
Configuration: 9,000 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	832.26	849.17	854.04	877.88	883.33	907.67
Water usage	$nominal	21,510.00	22,230.00	23,040.00	23,850.00	24,750.00	25,560.00
Wastewater service	$nominal	5,585.50	5,967.03	6,361.81	6,790.04	7,233.44	7,713.24
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	4,884.30	4,884.30	4,884.30	4,884.30	4,884.30	4,884.30
Trade waste	$nominal	875.70	8,665.95	8,882.60	9,104.67	9,332.29	9,565.59
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	33,728.96	42,596.46	44,022.75	45,506.89	47,083.35	48,630.80
% change on the previous year			26.3%	3.3%	3.4%	3.5%	3.3%
Water usage % of water charges		96%	96%	96%	96%	97%	97%
Water usage % of total bill		64%	52%	52%	52%	53%	53%

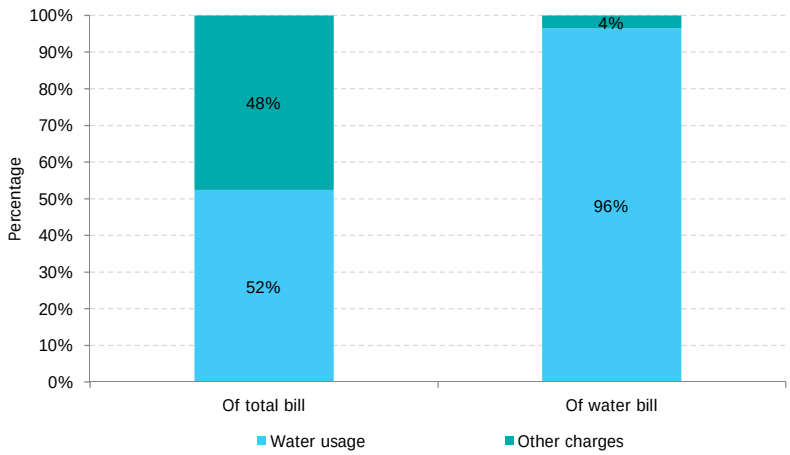
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	832.26	907.67	75.41	15.08	0.29
Water usage	$nominal	21,510.00	25,560.00	4,050.00	810.00	15.58
Wastewater service	$nominal	5,585.50	7,713.24	2,127.74	425.55	8.18
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	4,884.30	4,884.30	-	-	-
Trade waste	$nominal	875.70	9,565.59	8,689.89	1,737.98	33.42
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	33,728.96	48,630.80	14,901.84	2,980.37	57.31

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $33,729.
By 2024-25 this bill is projected to be $48,631, a change of $14,902 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 44.2%.
The annual average change in percentage terms is 7.6% per annum.
The customer has three meters - two 20mm, and a 50mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste moderate annual agreement fee decreases at the start of the price period. The customer now pays high strength charges based on actual discharge, rather than a deemed average strength being included in the annual agreement fee.

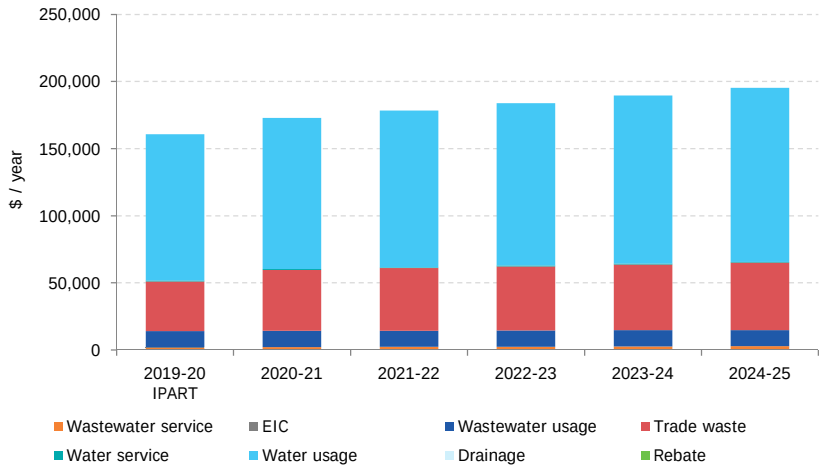
5.23 Bill impacts : Large industrial firm with high strength trade waste

Charges: water, sewer, major trade waste
Configuration: 45,600 kL p.a. / 50mm meter / discharge factor 40%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	630.50	643.31	647.00	665.06	669.19	687.63
Water usage	$nominal	108,984.00	112,632.00	116,736.00	120,840.00	125,400.00	129,504.00
Wastewater service	$nominal	1,985.68	2,121.73	2,262.42	2,415.12	2,573.15	2,744.25
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	12,140.40	12,140.40	12,140.40	12,140.40	12,140.40	12,140.40
Trade waste	$nominal	36,897.27	45,386.97	46,521.65	47,684.69	48,876.80	50,098.72
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	160,679.04	172,924.41	178,307.46	183,745.27	189,659.54	195,175.00
% change on the previous year			7.6%	3.1%	3.0%	3.2%	2.9%
Water usage % of water charges		99%	99%	99%	99%	99%	99%
Water usage % of total bill		68%	65%	65%	66%	66%	66%

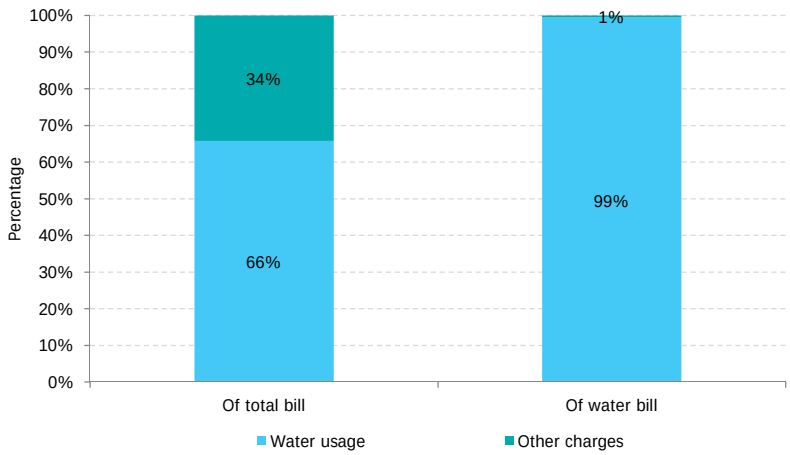
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	630.50	687.63	57.13	11.43	0.22
Water usage	$nominal	108,984.00	129,504.00	20,520.00	4,104.00	78.92
Wastewater service	$nominal	1,985.68	2,744.25	758.58	151.72	2.92
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	12,140.40	12,140.40	-	-	-
Trade waste	$nominal	36,897.27	50,098.72	13,201.46	2,640.29	50.77
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	160,679.04	195,175.00	34,495.96	6,899.19	132.68

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $160,679.
By 2024-25 this bill is projected to be $195,175, a change of $34,496 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 21.5%.
The annual average change in percentage terms is 4.0% per annum.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period. Base high strength charges per kilogram related to the relevant wastewater treatment plant have increased.

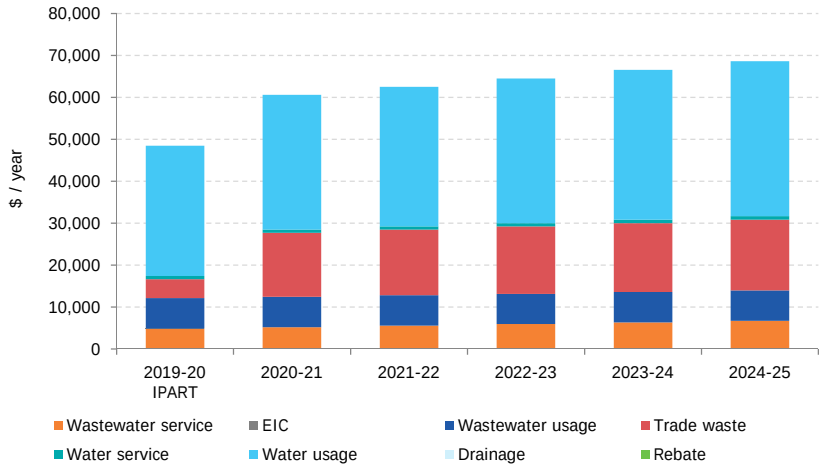
5.24 Bill impacts : Large industrial firm with high strength trade waste

Charges: water, sewer, major trade waste
Configuration: 13,000 kL p.a. / Multiple meters / discharge factor 76% -100%

Composition of the projected annual bill ($nominal)

		2019-20 IPART	2020-21	2021-22	2022-23	2023-24	2024-25
Water service	$nominal	731.38	746.24	750.52	771.47	776.26	797.65
Water usage	$nominal	31,070.00	32,110.00	33,280.00	34,450.00	35,750.00	36,920.00
Wastewater service	$nominal	4,857.30	5,192.88	5,539.33	5,916.02	6,305.24	6,727.33
EIC	$nominal	41.20	-	-	-	-	-
Wastewater usage	$nominal	7,242.70	7,242.70	7,242.70	7,242.70	7,242.70	7,242.70
Trade waste	$nominal	4,513.70	15,290.96	15,673.23	16,065.07	16,466.69	16,878.36
Drainage	$nominal	-	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-	-
Projected total annual bill	$nominal	48,456.28	60,582.78	62,485.79	64,445.25	66,540.89	68,566.03
% change on the previous year			25.0%	3.1%	3.1%	3.3%	3.0%
Water usage % of water charges		98%	98%	98%	98%	98%	98%
Water usage % of total bill		64%	53%	53%	53%	54%	54%

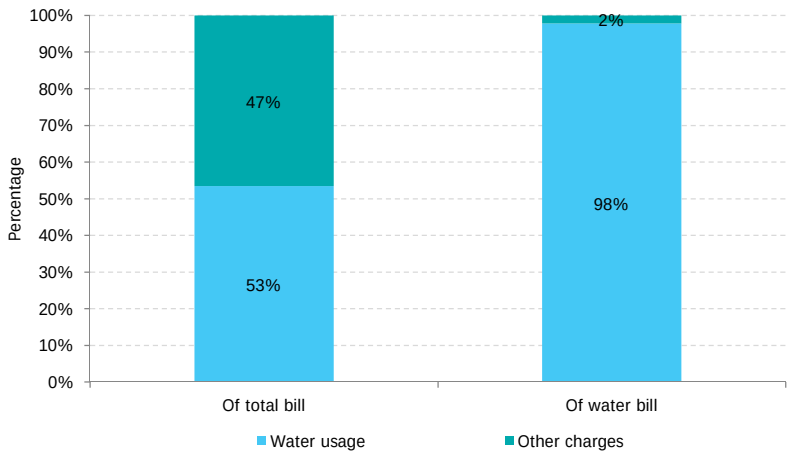
Projected annual bill ($nominal terms)



Changes over the 2019-20 to 2024-25 period ($nominal)

		2019-20 Bill	2024-25 Bill	Difference	Av Ann Δ	Av Wkly Δ
Water service	$nominal	731.38	797.65	66.27	13.25	0.25
Water usage	$nominal	31,070.00	36,920.00	5,850.00	1,170.00	22.50
Wastewater service	$nominal	4,857.30	6,727.33	1,870.03	374.01	7.19
EIC	$nominal	41.20	-	(41.20)	(8.24)	(0.16)
Wastewater usage	$nominal	7,242.70	7,242.70	-	-	-
Trade waste	$nominal	4,513.70	16,878.36	12,364.66	2,472.93	47.56
Drainage	$nominal	-	-	-	-	-
Rebate	$nominal	-	-	-	-	-
Projected total annual bill	$nominal	48,456.28	68,566.03	20,109.75	4,021.95	77.35

Average water usage component 2020 - 25



Notes

All values are shown are in $nominal terms. Annual inflation of 2.5% is assumed over the price period.
The typical bill for this customer category in 2019-20 is $48,456.
By 2024-25 this bill is projected to be $68,566, a change of $20,110 in $nominal terms.
The percentage change in the bills over the 5 years (i.e. by 2024-25) is 41.5%.
The annual average change in percentage terms is 7.2% per annum.
The customer has two meters - a 20mm and a 50mm.
The water usage charge increases in real terms over the period to maintain the variable proportion of the bill.
Wastewater service charge = (ME meter connection charge x discharge factor) + deemed usage allowance
The EIC will no longer be charged after 2019-20.
Wastewater usage charge = ((water consumption x discharge factor) - discharge allowance) x wastewater usage charge
Trade waste major annual agreement and inspection fees increase at the start of the price period. Base high strength charges per kilogram related to the relevant wastewater treatment plant have increased.

6. Abbreviations

Acronym	Term
AIR	Annual information return
CPI	Consumer price index
CTGM	Chichester trunk gravity main
EIC	Environmental improvement charge
GL	Gigalitres (ie. 1,000,000,000 litres)
HSP	Hunter Sewerage Program
IPART	Independent Pricing and Regulatory Tribunal (NSW)
kL	Kilolitre (ie. 1,000 litres)
LRMC	Long-run marginal cost
mm	millimetres
ML	Megalitres (ie. 1,000,000 litres)
NPV	Net present value
RAB	Regulatory asset base
SIR	Special information return
SRMC	Short-run marginal cost
WACC	Weighted average cost of capital

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