REVIEW OF PRICES FOR HUNTER WATER

SUPPLEMENTARY RESPONSE TO IPART ISSUES PAPER

Hunter Water

06 November 2019

SUMMARY

In our response to IPART's Issues Paper on 21 October 2019, we requested more time to consider how to treat increased costs arising from our response to drought and concurrent reductions in revenue. The current drought makes this issue particularly pertinent.

This supplementary submission assess potential regulatory responses to attenuate the potential material impact on our financeability metrics, should the drought continue. It also provides further information in support of our proposed investment in recycled water infrastructure to irrigate public open space.

It does not repeat information from the July 2019 package of price submission documents or our response to the Issues Paper in October 2019.

This summary captures the key points in our supplementary submission.

Managing drought-related costs

- Like all of NSW, the Lower Hunter is currently feeling the impact of drought, with Level 1 water restrictions introduced for the first time in 25 years. The Bureau of Meteorology's outlook for the summer months is for relatively hot and dry conditions. Under continuing dry conditions, we anticipate implementing level 2 restrictions at 50% storage levels in February 2020 and level 3 restrictions at 40% storage levels in June 2020.
- We are currently forecasting additional operating costs of $10 million to the end of February 2020 on a range of water conservation measures, emergency supply options and managing related operational impacts within the water supply and wastewater systems. This would increase to more than $20 million to the end of June 2020 if the drought continues. In addition, we recently passed the trigger for detailed design of a drought-response desalination plant, with an estimated total capital cost in the order of $100 million.
- Hunter Water is not proposing a drought cost-pass through mechanism to pass the costs on to customers within the regulatory period. We are of the view that IPART's criteria (or preconditions) for approving the pass through of costs associated with specific events are overly prescriptive and limiting.
- At this stage, we consider the most appropriate regulatory response, of those available, is to adopt a four-year regulatory period, 1 July 2020 to 30 June 2024. We still see merits in a five-year regulatory period in the future, for the reasons detailed in our Price Submission.
- Hunter Water recognises that it could ask IPART for an early price review and new determination, possibly after three years, as one option to address extraordinary drought-related costs and potential financeability concerns.

Managing variations in water sales revenues

- IPART's 'demand volatility adjustment mechanism' applies a plus or minus 5% revenue dead-band when assessing actual water sales during a price review. Hunter Water has calculated an $8.8 million adjustment, to be returned to customers in the next regulatory period, for water sales revenue above the 5% threshold during the period 2016-17 to 2018-19.
- We are confident that Hunter Water's new 'climate-correction' demand forecasting methodology will produce more accurate consumption forecasts in future years, under average climatic conditions. Our forecasts do not account for any 'path dependency effect' following a period or prolonged drought conditions and mandated water restrictions.

- We have documented the possible impact on water sales of various water restrictions levels. For example, our demand modelling shows that water sales could fall by 5.6% if Level 1 restrictions apply for a full year, 14.7% if Level 2 restrictions apply for a full year or 29.8% if Level 3 restrictions apply for a full year.
- Hunter Water recovers the majority of the annual revenue requirement for water through the usage price – more than 80% of the typical household water bill is variable. The majority of our costs of delivering the water service are fixed, but our water revenues rely heavily on a volumetric charge.
- Hunter Water has proposed a revenue adjustment mechanism in drought conditions: the 'modified demand volatility adjustment mechanism'. We see this proposal as a way of safeguarding Hunter Water, within the regulatory period, should there be a sustained and severe reduction in water sales.
- Importantly, the proposed mechanism would only apply if mandated water restrictions were in place and Hunter Water's water sales were more than 5% below IPART's allowance – in essence, an uncontrollable variation in water sales. The mechanism would allow Hunter Water to recover lost water revenue below the 5% threshold through a water service charge adjustment in the following year.
- Hunter Water's performance against the key financial metrics will deteriorate in any drought event. In the absence of a mechanism to recover the unbudgeted operating costs of implementing water restrictions and investing in water conservation measures, we believe there is a strong case to incorporate a mechanism that protects Hunter Water from material revenue shortfalls if exceptional circumstances arise.

Investment in recycled water to irrigate parks, sporting grounds or gardens

- Hunter Water's 2019 Price Submission proposed $11.5 million from 2020 to 2025 to enable us to invest in wastewater recycling schemes for irrigation of parks, sporting grounds or gardens in the Hunter region. We included this expenditure because our customers told us they wanted us to provide this type of liveability service that benefits the community and environment, as evidenced through a willingness to pay study.
- The proposal is also consistent with feedback received through customer engagement for the review of the Lower Hunter Water Plan. It is clear from the LHWP that our community supports the use of recycled water for non-drinking purposes, based on a range of considerations, including costs.
- The expenditure was based on preliminary negotiations with possible end-users of one scheme and consisted of a combination of avoided costs in the water system (around $5 million, calculated using the water usage price as a proxy for the long-run marginal cost of water) and external benefits to the community and environment (around $6 million, supported by robust evidence of willingness to pay).
- Hunter Water wishes to clarify that it is seeking $6 million over the price period as a contribution from the broader customer base towards the costs of a new recycled water scheme for irrigation of parks, sporting grounds or gardens. This amount results in a bill impact of no more than $1 per year for a residential household (or non-residential equivalent). 77% of survey respondents were willing to pay this amount if Hunter Water delivers at least 20 ML of recycled water per year by 2025.

- We mindful of delivering on the preferences of our broader customer base in the most efficient way. We understand that ideally we would be proposing a specific recycled water project, including details on end-users and co-investors, full costings and expected revenues. However, we are significantly progressed in identifying a range of possible schemes that would meet the conditions described in the willingness to pay study and ranking these based on cost-effectiveness.
- We are confident that the $6 million financial contribution will assist us in securing end-use customer commitment, which experience shows is critical for the success of recycled water schemes. The amount requested is modest, given the willingness to pay study findings support significantly more expenditure for at least 150 ML per year of addition recycling. We intend to also continue discussions with potential end-use customers on recycled water prices and pursue any opportunities for grant funding that arise.
- We note that IPART considers the efficiency of our actual capital expenditure in the next price review, which presents an opportunity to make adjustments to the contribution from the broader customer base with reference to the specific characteristics of the scheme, including adjustments to avoided costs and external benefits.

Contents

1. Introduction

We lodged '*Hunter Water's 2019 Price Submission*' with IPART on 1 July 2019 (our summary 'pricing proposal', ten technical papers and regulatory information returns). This was the first step in IPART's propose-respond regulatory model for the 2019-20 price review.

Our price submission provided a detailed breakdown of the proposed capital and operating expenditure programs over five years, proposed annual revenue requirements and proposed prices for all regulated services. The submission also provided the background to key issues, the rationale for expenditure and pricing proposals, and an analysis of the likely bill impacts for various customer categories.

IPART published its Issues Paper for the review of Hunter Water's prices on 17 September 2019, inviting customer and stakeholder comment with 53 prompting questions.

We lodged a response to most matters raised in IPART's Issues Paper on 21 October 2019. Therefore this supplementary submission focusses on form of regulation opportunities to attenuate the potential material impact of increased costs and reduced revenues on our financeability metrics, should the drought continue.

Section 2 sets out the magnitude of potential drought impacts and our proposed treatment of the impacts for the next regulatory period.

Section three provides further information in support of our proposed investment wastewater recycling. It describes how our claim for funding aligns with IPART's pricing arrangements for recycled water. It also seeks to advance discussions on the nature of external benefits being valued through customer willingness to pay studies.

All dollar amounts presented in this paper are shown in real, $2019-20 terms.

2. Regulatory treatment of drought-related variations in costs and revenues

Hunter Water's 2019 Price Submission, like past price submissions, assumed no drought conditions over the next price path – in effect, that water storages would stay above 80% at all times. Our expenditure proposals, revenue requirements and proposed prices were all based on this assumption.

Our price submission set out the case to extend the typical regulatory period for water utilities by one year (to five years), noting some safeguards and mechanisms in IPART's regulatory model that assist with managing uncertainty. One such safeguard is the demand volatility adjustment mechanism, which provides for revenue changes in future periods for material deviations between actual demand and the forecast demand used to set prices. At the time, Hunter Water was also considering a drought cost pass-through mechanism for unbudgeted operating costs but did not provide a firm proposal. Together these two mechanisms had the potential to manage the increases costs and concurrent decreased revenues that occur during drought.

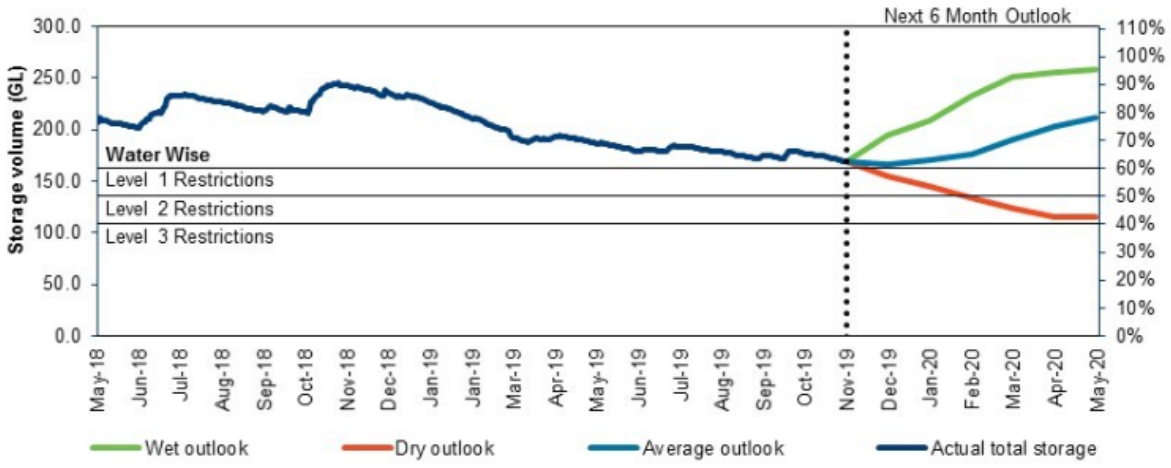
We have now had further time to consider the likely impacts of drought on our costs, revenues and financeability, along with management options. This section sets out the magnitude of drought impacts and our proposed treatment of the impacts for the next regulatory period.

2.1 Managing drought-related costs

2.1.1 Persistent drought conditions would result in higher expenditure

Our water storages have fallen steadily throughout 2019 (see Figure 1), resulting in 'level 1' water restrictions in mid-September 2019. The last time we implemented water restriction was in the early 1990s. The Bureau of Meteorology's outlook for the summer months is for relatively hot and dry conditions. Under continuing dry conditions, we anticipate implementing level 2 restrictions at 50% storage levels in February 2020 and level 3 restrictions at 40% storage levels in June 2020.

Figure 1 Hunter Water's outlook for water restrictions during 2019-20



Source: Hunter Water.
Note: Analysis based on actual water storage volume at end October 2019

The Lower Hunter Water Plan 2014 incorporated a drought-response desalination plant should water storages fall below specific thresholds. This drought-response measure is our insurance policy in a worst case scenario if the Lower Hunter reached critical water storage levels in unprecedented drought conditions. We would only build the plant after implementing a suite of less expensive water conservation measures.

We recently passed the 65% trigger to commence detailed design of the drought-response desalination plant at Belmont. In October 2019, we submitted an 'environmental impact statement' for the Belmont project with the NSW Department of Planning. We anticipate that the Department will publish the EIS before the end of 2019.

Hunter Water's business case for the Belmont Desalination Scheme is subject to the NSW Government's Infrastructure Investment Assurance Framework (currently gateway 1 review). Hunter Water's preliminary (P90) estimate of the total capital costs for the Belmont Desalination Scheme is in the order of $100 million for a 15 ML per day plant, providing critical 'top up' to guard against the region running out of water. Some uncertainty with the project costs will remain until later stages of planning, design and procurement.

The Lower Hunter Water Plan 2014 set out a 35% threshold to start construction of the desalination plant and a 15% threshold to commence supply. Those thresholds are also under review.

Hunter Water will continue to invest in a range of water conservation measures and new initiatives should water storages remain at current levels or fall further. These conservation measures help slow the water depletion rate, making the water we have last longer.

Drought-response measures requiring additional operating expenditure include:

- Water efficiency projects with residential and non-residential customers, including management plans, audits, rebate schemes, water tank tune-ups and data loggers.
- Implementing restrictions including messaging, community water officers, processing exemptions and monitoring compliance.
- Community engagement including advertising, awareness events, Love Water campaign, engaging with schools, advocacy programs and general community education.
- Managing operational impacts including managing sewer chokes, operating the Tomago borefields, additional leakage management work, reducing leak response times and Central Coast transfers.
- Drought response option development including the detailed design for the Belmont plant, investigating other water sources and investigating recycled water schemes.

Our work in preparing for drought related measures has ramped up over recent months. We are currently forecasting additional operating costs of $10 million to the end of February 2020. This would increase to more than $20 million to the end of June 2020 if the drought continues.

2.1.2 Regulatory treatment

Drought cost pass-through

The Issues Paper for the Review of WaterNSW (Greater Sydney) outlines IPART's overall position on the under- and over-recovery of operating and capital expenditure:[1]

> *On balance, we typically do not make retrospective adjustments for any under- or over-recovery between determination periods unless in exceptional circumstances. This is because we set efficient operating and capital expenditure for the regulatory period with an expectation that costs can fluctuate, some new costs will rise, and some expected costs will not occur. If there is no bias in the forecasts, we would expect the gains from underspends to offset the losses from overspends over the longer term.*

The current drought conditions are an obvious example of 'exceptional circumstances' – something that is specific and unique to our industry sector. As outlined above, Hunter Water has incurred additional operating expenditure to date, and this spend will increase significantly if dry conditions prevail. None of this expenditure was included in IPART's 2016 Determination, as it was not possible to foresee current circumstances at that time.

IPART's regulatory model acknowledges that drought is an 'exceptional circumstance' and provides for some uncontrollable drought-related costs to be passed through to customers during the regulatory period (e.g. it allows Sydney Water to recover the additional cost associated with purchasing desalinated water from the Sydney Desalination Plant).[2]

Hunter Water supports the concept of a cost pass-through mechanism during drought events. Entering into water restrictions results has a double hit on water utilities: higher unplanned and unbudgeted expenditure at the same time as water sales revenue is falling. Depending on the severity of both impacts, Hunter Water's performance against the key financial metrics will decline.

IPART's sets out six criteria or preconditions for approving the pass through of costs associated with specific events.[3] Hunter Water is of the view that IPART's criteria are overly prescriptive and limiting. Three of those criteria are particularly onerous:

1. The resulting efficient costs associated with the trigger event can be fully assessed including whether there are other factors that fully or partially offset the direct cost of the event.
2. The resulting cost is assessed to exceed a materiality threshold.
3. The regulated business cannot influence the likelihood of the trigger event or the resulting cost.

IPART's approach works well in the instance of Sydney Water passing through the costs of operating the Sydney Desalination Plant, where IPART reviews and approves SDP's expenditure in a separate determination. IPART's approach has shortcomings where the costs are not known exactly in advance or where the utility has some discretion or influence over the level of expenditure.

Hunter Water will spend more on operating costs as storages fall, possibly more than $20 million per year. Likewise we will incur capital costs if we need to construct the Belmont Desalination Scheme or invest in other drought-response capital projects. In most of these cases, it is not possible to exactly assess and pre-determine those costs given our lack of recent experience with drought – by definition, 'exceptional circumstances'. In addition, there is no hard trigger for additional spending on some water conservation measures and we have some influence over the resulting cost in other areas.[4]

[1] IPART, 2019 (d), p. 75.
[2] IPART, 2019 (a), p. 112.
[3] Ibid, p. 113 (Box 10.2).
[4] The 2014 Lower Hunter Water Plan, the NSW Government's 20 year water security blueprint, provides guidance but is currently undergoing a periodic review.

IPART has approved our 'Economic level of water conservation' (ELWC) methodology that sets out a framework for comparing the value of water saved against the present value of the costs of water conservation measures. We note that Sydney Water's 2019-2023 Operating Licence mandates the implementation of any project that satisfies the ELWC, including the projects and initiatives that are economic when the short-run value of water increases as storages fall.[5]

Hunter Water suggest that it may be possible to link the ELWC methodology with a drought cost pass-through mechanism. Projects that satisfy the ELWC, where supported by a detailed assessment, could be included a pass-through mechanism tied to the level of water restrictions. Hunter Water will work on this concept for the next price review.

Hunter Water notes that IPART can establish a true-up arrangement in the following year should actual efficient costs from a particular program or project be lower or higher than initially forecast. In this way, IPART should be less concerned about assessing and approving exact costs in a cost-pass methodology. Provided the initial cost assessment was reasonable and consistent with the ELWC assessment, IPART could allow the recovery of costs when a trigger event occurs, and true-up those costs if there a material difference between forecast and actual efficient costs.

WaterNSW has suggested that IPART allow the recovery of financing costs for capital expenditure on major drought-response measures where that expenditure is prudent and efficient. IPART's Issues Paper for WaterNSW explained the approach as follows:[6]

> *We acknowledge that we currently do not compensate (or claw back from) the business for the return on capital for the period between when additional costs (or cost savings) are incurred and when the next price determination occurs. The reason for this is to provide the business with financial incentives to manage its capital expenditure within its set allowance. For this price review, we will investigate the appropriateness of continuing this approach and consider alternative options that would not compromise our regulatory framework.*

The Belmont Desalination Plant was part of the NSW Government's Lower Hunter Water Plan and the project business case is currently subject to scrutiny by Infrastructure NSW (under NSW Treasury's Assurance Framework). Hunter Water would support an approach that allowed Hunter Water to recover the financing costs for the Belmont Desalination Plant, should it proceed, measured using the WACC. This approach would provide investment certainty, help with credit-rating assessments and fairly share the costs of drought response measures between the utility and customers.

Shorter regulatory period

Hunter Water's 2019 Price Submission (Technical Paper 3, Part A) proposed a five-year price path from 1 July 2020 to 30 June 2025. Our submission set out the following case for IPART to extend the typical regulatory period for water utilities by one year:

> *For the next regulatory period, the additional year would provide revenue certainty for Hunter Water, price and bill certainty for our customers, and reduce some of the administrative costs associated with the regulatory review process.*
>
> *For future price reviews, a five-year determination cycle would make a crucial difference. It would allow a window of time for IPART to work with the NSW metropolitan water utilities on broader improvements and refinements to the regulatory model – a process and approach that could be repeated on a five-yearly cycle.*[7]

[5] NSW Government, 2019.
[6] IPART, 2019 (d), p. 79.
[7] Hunter Water's 2019 Price Submission, Technical Paper 3, Form of Regulation, p.A4.

Technical Paper 3 included a standalone section, *A roadmap for modernising regulation*, outlining reasons for reviewing IPART's regulatory framework for public water utilities. The roadmap set out a process for systematically addressing key elements of IPART's regulatory framework to ensure it remains best placed to achieve the NSW Government's objectives. The roadmap did not detail a specific regulatory model or specific changes. Instead, we identified some potential areas for review, giving examples from other jurisdictions and sectors.

Our roadmap suggested a five-year regulatory period, as this would allow IPART three years to review and design possible improvements to the current regulatory model. We observed that IPART had initiated multiple reviews of different parts of the regulatory framework in the current period, leaving little time to consider broader reforms in an integrated and prioritised way.

We note that Sydney Water's 2019 Price Submission proposed a four-year price path for the next regulatory period, and that IPART has set out a preliminary view in support of this proposal. Hunter Water's proposal for a broader review of IPART's approach over a five-yearly regulatory cycle would work best if Sydney Water's and Hunter Water's price reviews were aligned.

Our pricing proposal discussed various safeguards and mechanisms in IPART's regulatory model that helped Hunter Water form a judgement in favour of five years. This included improvements to IPART's trailing cost of debt in the WACC method and the demand volatility adjustment mechanism. At the time, Hunter Water was considering a drought cost pass-through mechanism for unbudgeted operating costs.

IPART's Issues Paper examined the merits of a longer, five-year regulatory period:

> *"Advantages include greater price stability and revenue predictability (which may lower a utility's business risk and assist investment decision making); strong incentives for a utility to achieve efficiency gains which are later passed on to customers; and reduced regulatory costs.*
>
> *Disadvantages include increased risk associated with using forecast data to set prices; possible delays in customers benefitting from any efficiency gains; and the risk that changes in the industry will impact the effectiveness of the Determination.*

IPART has given a preliminary view that a *"5-year determination period is appropriate"*. IPART has sought feedback on this position from all stakeholders, noting the risk of forecasting expenditure levels over a longer regulatory period:

> *A key factor in our decision will be the level of confidence that we have in expenditure forecasts in the later years, which can be a significant risk factor. We will also consider whether it is beneficial to align the Hunter Water price review with the Sydney Water price review, which we are undertaking concurrently.*[8]

The Public Interest Advocacy Centre's (PIAC) response to the Issues Paper supported undertaking a comprehensive review of the regulatory model outside of the metropolitan price reviews, as proposed by Hunter Water.[9] However PIAC preferred a four-year price period due to the improved consistency arising for alignment between Sydney Water and Hunter Water price reviews, and the material uncertainty in costs and demand.[10]

Hunter Water's revised proposal – a four-year regulatory period

In light of the ongoing drought conditions, Hunter Water has reconsidered its positon on the length of the determination period. Hunter Water's now proposes a four-year regulatory period, 1 July 2020 to 30 June 2024.

The risk remains that drought conditions may prevail for longer and storages fall further. Hunter Water may incur far higher levels of capital expenditure to ensure customers receive a basic level of supply. Hunter Water therefore proposes a shorter regulatory period to deal with the impact of these uncertain events.

[8] IPART 2019 (a), p.112.
[9] PIAC, 2019, p. 8.
[10] Ibid, p. 7.

Hunter Water recognises it has the option to ask IPART for an early price review in exceptional circumstances. Additional unbudgeted expenditure may impact our financial metrics, pushing the business below the thresholds in IPART's financeability test. Similarly, NSW Treasury requires Hunter Water to undergo an annual credit rating by one of the main agencies. We would pursue an early re-opening and new determination, possibly after three years, should there be pressure on our investment-grade credit rating.

IPART requires five-year forecasts in any case

Hunter Water's 2019 Price Submission proposed a five-year regulatory period and provided five-year forecasts for each element of the building block model. We also proposed water, wastewater and stormwater charges looking out over a five-year period.

IPART's Guidelines for Water Agency Pricing Submissions require water utilities to submit five years of data when preparing proposed expenditure, revenues and prices.[11] IPART ultimately makes the decision on the length of the determination period at the end of the price review, anywhere from one to five years depending on the circumstances at the time.

We do not anticipate that a four-year regulatory period would have any material impact on our pricing proposal. A four-year regulatory period need not alter IPART's approach to the two transitional tariff arrangements that we have proposed in this review:

1. Residential wastewater service charges: Our response to IPART's Issues Paper (21 October 2019) flagged a quicker transition path for wastewater service charge levied on the owners of apartments. Given the lower revenue requirement and lower forecast bill impacts, we proposed a two- or three-year transition path, not the six-year path in our pricing proposal.
2. Location-based prices: Our pricing proposal set out a transition path for large water customers using more than 50ML in seven distribution zones. We proposed a common water usage price for all water customers from 2024-25. IPART could retain this timeline if it decides to phase-in the removal of location-based prices.

2.2 Water sales revenue

2.2.1 Demand volatility adjustment mechanism

Material variations between actual water sales and those used to determine prices can cause issues for a water utility and its customers. The main concerns are described in IPART's Issues Paper, where it sets out the following rationale for a applying a 'demand volatility adjustment mechanism':[12]

> *We consider it appropriate to take a risk sharing approach between the utility and customers for small variations (ie, less than 5%) between forecast and actual water sales. However, for larger variations we consider that applying a demand volatility adjustment mechanism ensures that prices are cost-reflective over the medium term. If actual consumption is much higher or much lower than forecast, this could result in customers paying too much or, conversely, affect the financeability of the utility.*

Hunter Water's response to the Issues Paper calculated a net revenue adjustment for the current regulatory period in accordance with the 'demand volatility adjustment' method set out by IPART. We summed water sales revenue over the first three years of the current period: actual sales revenue for 2016-17, 2017-18 and 2018-19. We then looked at the variance with IPART's 2016 water sales allowance, a difference of 7.4% or $29 million.

[11] IPART, 2018.
[12] IPART, 2019 (a), p. 74.

Revenue greater than the 5% threshold equates to $9.5 million. From this we deducted operating costs of $600,000 incurred in providing the additional water (based on our estimate of the short-run marginal cost of water). The calculated net adjustment is $8.8 million that could be returned to customers.[13]

Hunter Water supports an approach whereby IPART spreads the reduction over each year of the next regulatory period. We envisaged that IPART would simply reduce the water revenue requirement in each year by the same NPV amount, effectively reducing the water service charge (base 20mm meter) in each year.[14]

We note that the updated water service charges provided in our response to the Issues Paper were approaching zero under the lower WACC forecast, even without applying the demand volatility adjustment mechanism. As previously flagged, Hunter Water would like to discuss the balance between water service and usage charges with IPART when the outcomes of the current expenditure review and IPART's assessment of the long-run marginal cost of water are further advanced.

2.2.2 Improved method for forecasting water demand

Hunter Water's response to IPART's Issues Paper detailed improvements and refinements to our water demand forecasting methodology. We explained how we developed a new statistical technique for determining the starting year demand, known as the 'climate correction' method. We have also updated the model we use to forecast demand by sector from the new starting point. The Department of Planning, Industry and Environment has overseen an independent review of this work over the past six months.

We have provided IPART with revised forecasts of water demand and wastewater discharges using the new method.[15] By looking at the impact of climate on average demand, we now forecast slightly lower residential water demand and materially higher non-residential demand. Our previous approach for estimating non-residential demand did not appropriately account for climate-dependent factors when assessing non-residential trends. Figure 2 shows actual demands and our long-term forecasts for the residential and non-residential sectors under the old and new methodologies.

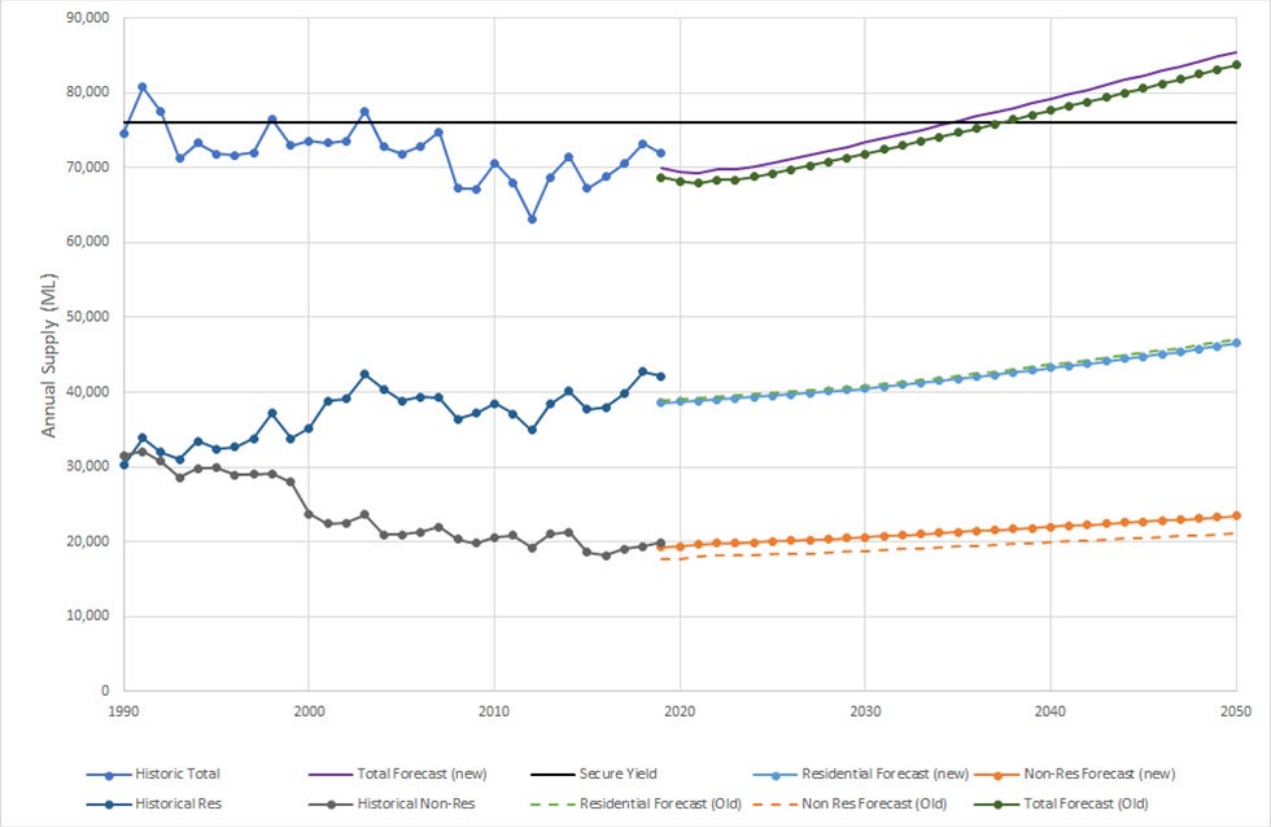
Hunter Water notes that following the Millennium drought of the mid-2000s, many water utilities in Australia experienced a long period of below historical water sales after water restrictions were lifted. The longer the duration of water restrictions and the deeper the fall in storages levels, the more pronounced was this 'slow rebound' effect. We have not accounted for this possible change in customer behaviour, a form of path dependence, in our forecast of water sales.

[13] Hunter Water completed the first billing cycle for 2019-20 at the end of 31 October 2019. We have reviewed the accuracy of the estimate for 'unbilled consumption' that was previously made at 30 June 2019. This shows that we received $0.9 million less usage revenue compared to the value that was estimated and accrued at 30 June 2019.

[14] This occurs because service charges are a balancing item set to recover residual revenue requirements after accounting for revenue from water sales at set water usage prices.

[15] Hunter Water, 2019 (b), section 6.

Figure 2 Forecast residential, non-residential and total demand using the old and new demand forecast methodology



Source: Hunter Water.

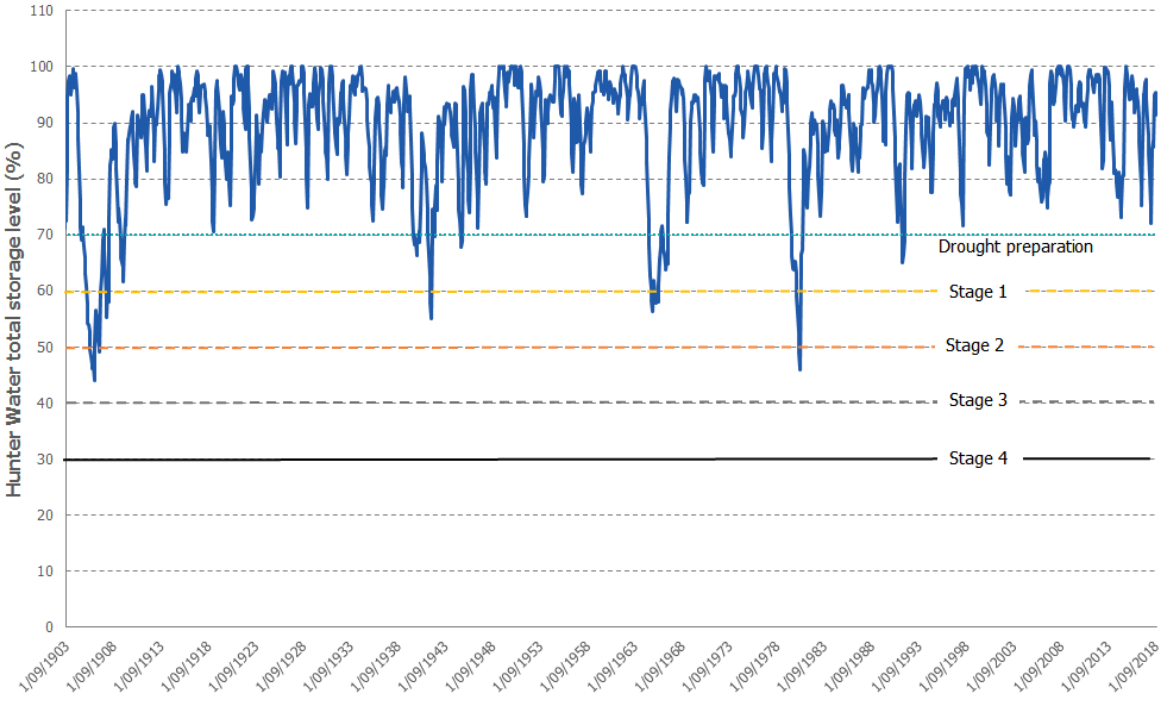
2.2.3 Likelihood of triggering water restrictions

The Lower Hunter Water Plan 2014 set out triggers for water restrictions based on available water storages: Level 1 at 60% storage levels, Level 2 at 50% and Level 3 at 40%. The Minister for Water makes an order under the *Hunter Water Regulation 2015* to give legal effect to the restrictions. The order is made a few weeks before the restrictions commence, so actual storage levels may not exactly coincide with the trigger level on the day restrictions start. Restrictions may be lifted when storages levels exceed 70%, taking into account the season and weather outlook at that time.

Under 'normal' conditions our current storages (with a capacity of 277 GL) yield around 76 GL per year, or 233 ML per day. This compares with an average consumption level of around 190 ML per day, increasing to 215 ML per day or more in summer months. In extended hot, dry periods this supply buffer can erode quickly.

While future climate conditions are inherently uncertain, recent history provides some empirical information on drought conditions observed in our region. Storage modelling based on observed climate outcomes over the last 120 years or so is depicted in Figure 3. This shows how our current storage capacity and demand would be affected if we were to re-live past weather patterns.

Figure 3 Storage levels using past rainfall and current storage infrastructure



Source: Hunter Water.

A more detailed analysis of past drought events and their likely impact on our storages (if repeated today) is provided in Table 1. A re-occurrence of a major drought event suggests that Hunter Water could reasonably expect to be in drought-response mode (i.e. managing storage levels below 70%) for anywhere between 12 and 24 months. This analysis does not include the current drought period.

Table 1 Duration of our drought program if past droughts were repeated today

Drought characteristic	1906 drought	1942 drought	1965 drought	1980 drought
Preparatory (and exit) phase (70-60%)	7 months	2 months	15 months	11 months
Duration of Stage 1 (60-50%)	10 months	2 months	7 months	3 months
Duration of Stage 2 (50-40%)	8 months	-	-	2 months
Total period for which HWC storage would be operating below 70%	25 months	4 months	22 months	16 months
Minimum storage reached	44%	55%	56%	46%

2.2.4 Financial impact of water restrictions

Hunter Water implemented Level 1 water restrictions on 16 September 2019 for the first time in more than 25 years. We reported a fall in water sales of 12% over the first five weeks of water restrictions.[16]

Our water planning team has modelled the potential reduction in water sales at different restriction levels.

Under Scenario A, where the current Level 1 water restrictions are in place to February 2020 followed by Level 2 restrictions to June 2020, our water sales would fall by 4,520 ML or 7.5% (using Hunter Water's new methodology to forecast unrestricted water sales in 2019-20).

Under Scenario B, where Level 1 water restrictions apply for the full year 2020-21, our water sales would fall by 3,420 ML or 5.6%. Under Scenario C, where Level 2 water restrictions apply for the full year 2020-21, our water sales would fall by 8,870 ML or 14.7%. Under Scenario D, where Level 3 water restrictions apply for the full year 2020-21, our water sales would fall by 17,970 ML or 29.8%.

Table 2 Forecast impact of water restrictions on Hunter Water's water sales, by level of restriction

Year	Restriction scenario	Unrestricted water sales (ML)	Restricted water sales (ML)	Reduction in water sales (ML)	Reduction in water sales (%)
Scenario A	Level 1 to Jan 2020, then Level 2 to 30 June 2020	59,920	55,400	4,520	7.5
Scenario B	Level 1 throughout 2020-21	60,370	56,950	3,420	5.6
Scenario C	Level 2 throughout 2020-21	60,370	51,500	8,870	14.7
Scenario D	Level 3 throughout 2020-21	60,370	42,400	17,970	29.8

Hunter Water's response to IPART's Issues Paper included an assessment of our performance against IPART's financeability metrics using WACC estimates of 4.1% and 3.2%. Applying both the benchmark and actual tests, we did not satisfy the funds from operations over debt metrics for a number of years with a WACC of 3.2%. This analysis assumed that our actual water sales over the next regulatory period would exactly match our forecast unrestricted water sales.

Hunter Water has supported IPART's proposed demand volatility adjustment mechanism in recent price reviews – we suggested a tightening of the earlier 10% dead-band in the 2015-16 price review. IPART's proposed mechanism uses a 5% dead-band as a margin of error for water demand forecasting. We anticipated that the mechanism would work to correct more material forecasting errors or as a mechanism to counteract larger swings in water sales for other reasons. We note that one of the stated rationales for the mechanism in IPART's Issues Paper is to ensure that variable water sales revenue do not affect the utility's financeability.

2.2.5 A modified demand volatility adjustment mechanism

Hunter Water considers that a modified demand volatility adjustment mechanism ('modified-DVAM') could be designed and implemented to address material revenue shortfalls in exceptional circumstances. This mechanism would protect Hunter Water against the risk of pro-longed period of water restrictions that severely impacted Hunter Water's water sales revenue.

[16] Minister for Water, Property and Housing, 27 October 2019.

We currently recover the bulk of our water annual revenue requirement through the water usage price, about an 80:20 ratio for usage and service charges. Under the current proposed prices, our reliance on the water usage charge increases over the price period. IPART's approach relies on setting the usage price with the reference to the long-run marginal cost, where there is an assumption that all inputs are variable. In reality most of the costs of delivering the water service are fixed, yet we rely on a volumetric charge to cover those costs, including our borrowing costs.

We see this modified-DVAM as a safeguard mechanism that provides protection within the regulatory period should there be a sharp fall in water sales. Importantly, the mechanism would only apply at those times when Hunter Water's actual water sales were driven lower by drought conditions and mandatory water restrictions – in essence, an uncontrollable variation in water sales.

The proposed modified-DVAM has four basic design features:[17]

1. Potentially enacted in any single year: unlike the standard DVAM which is assessed over a four-year period, the modified-DVAM could be triggered for a single year only.
2. Two triggers or pre-conditions must hold: the modified-DVAM would only be triggered if the Minister has enacted water restrictions in the Lower Hunter and Hunter Water's actual water sales were more than 5% below IPART's allowance.
3. Revenue recovery in the following year: IPART would allow an increase in Hunter Water's water service charges in the following financial year for an amount matching the lost sales in the year the triggers were met.
4. Revenue recovery only applies to lost water sales below the minus 5% threshold: with a one-year lag, IPART would allow Hunter Water to recover lost sales below the minus 5% threshold less the short-run marginal cost of water (representing the savings in operating costs from not having to treat and supply the water).

An important feature of these proposed arrangements is that IPART's standard DVAM would apply for all years at the next price (2023-24) review if the modified-DVAM was not triggered. If the modified-DVAM was triggered in, say, one year, then IPART would apply the standard DVAM across the other three years and make a revenue adjustment, up or down, in the following regulatory period.

Any year where the modified-DVAM was triggered would, by definition, result in much lower water sales. If Hunter Water's water sales were, in aggregate, more than 5% above IPART's allowance in the three years, these higher sales would not be netted off against lower sales in the year the modified-DVAM was in effect. In this way, customers would be protected under the standard-DVAM 5% upside threshold and Hunter Water would be able to recovered uncontrolled variances in water sales during periods where water restrictions apply.

Hunter Water's response to the Issues Paper supported IPART's proposed approach of only applying the adjustment mechanism in those years where actual water sales data was available. In the current price path, that covers the three-year period 2016-17 to 2018-19. In the next four-year regulatory period, IPART would apply the adjustment mechanism across a four-year period of actual water sales data: 2019-20 to 2022-23. In this way, IPART includes sales data across two price paths, including one year of data from the current price path.

Hunter Water proposes that the modified-DVAM should apply for the current financial year 2019-20, as this year forms part of IPART's standard DVAM model for the next price review. Hunter Water has met one of the triggers in this year, with Level 1 water restrictions currently in place. Hunter Water may satisfy the second necessary trigger if water sales revenue falls below the 5% threshold across the remaining months of 2019-20.

Using Scenario A (see Table 2), where Level 1 water restrictions apply to February 2020 following by Level 2 restrictions to 30 June 2020, Hunter Water's water sales would by 7.5% below IPART's allowance.

[17] The modified-DVAM concept outlined here was developed by Dr Z Peroski from Sydney Water. We are grateful for the concepts that Dr Peroski continues to contribute to advance economic regulation of the water industry.

Applying the modified-DVAM method, this would result in an increase in the base water service charge of about $12 per annum in 2020-21.

To further describe the potential impact on water charges of the modified-DVAM model, we have also modelled the potential revenue adjustment in Scenario C (Table 2) where Level 2 restrictions are in place throughout 2020-21. In this unlikely scenario, restricted water sales would be 8,870 ML or 14.7% below IPART's allowance (assuming IPART accepts Hunter Water's forecast). The total amount below the 5% threshold equates to 5,852 ML or $14.1 million. Deducting $700,000 in water treatment and distribution costs gives a net amount of $13.4 million. Dividing this amount by the 272,000 meter equivalents gives an annual increase in the base water service charge of about $50 per annum in 2021-22, about a 4% increase on the typical household bill in that year.

We would like to work with IPART on some of the operational details associated with the proposal over the coming months. We have identified two areas requiring further refinement:

1. What if restrictions were in place for only part of the year? There are two ways to approach this: only calculate the adjustment for those months where restrictions were in force or apply for the full financial year recognising that water sales must also fall below 5%.

2. How would we calculate 'actual sales' before the end of the financial year to calculate the service charge adjustment in the following year? Hunter Water understands that IPART uses a '10-month actuals' (July to April) and '2-month forecast' (May and June) when assessing any eligible pass-through of Sydney Desalination Plant costs in Sydney Water's water usage price. A similar approach could apply here, possibly with a further true-up, if necessary and material, in the year following the revenue recovery year using the actuals water sales for the May and June months.

3. Investment in recycled water to irrigate parks, sporting fields or gardens

3.1 Clarification of the costs we are seeking to recovery

Hunter Water's 2019 Price Submission (Technical Papers 1 and 2) proposed $11.5 million over the five-year period from 2020 to 2025 to enable us to invest in wastewater recycling schemes for irrigation of parks, sporting grounds or gardens in the Hunter region. We included this expenditure because our customers told us they wanted us to provide this type of liveability service that benefits the community and environment, as evidenced through a willingness to pay study. It is also consistent with feedback we have received through customer engagement for the revision of the Lower Hunter Water Plan (see section 3.2).

In Technical Paper 1 we outlined how our willingness to pay study complied with IPART's principles for customer engagement. We also attached a full copy of the study report, including survey questions and results. In our response to IPART's Issues Paper we provided more detail describing how our study was designed and executed in accord with the Productivity Commission report detailing best practice principles for using a contingent valuation approach to state preference surveys.[18]

We note that there has been some uncertainty in the evidentiary requirements to secure a contribution towards project costs from the broader customer base when the project appears to trigger two sets of guidelines – those for discretionary expenditure (to achieve outcomes above those mandated by regulation) and those for pricing arrangements for recycled water. We have reflected on the two sets of guidelines and consider them to be in accord.

We note this is an emerging area for water utilities and for IPART. We therefore welcome IPART's initiative in using this price review as an opportunity to clarify how it considers the broader customer base's willingness to pay for discretionary expenditure on recycled water schemes. In the Issues Paper, IPART reflects on its 2019 Final Report on recycled water prices and states:[19]

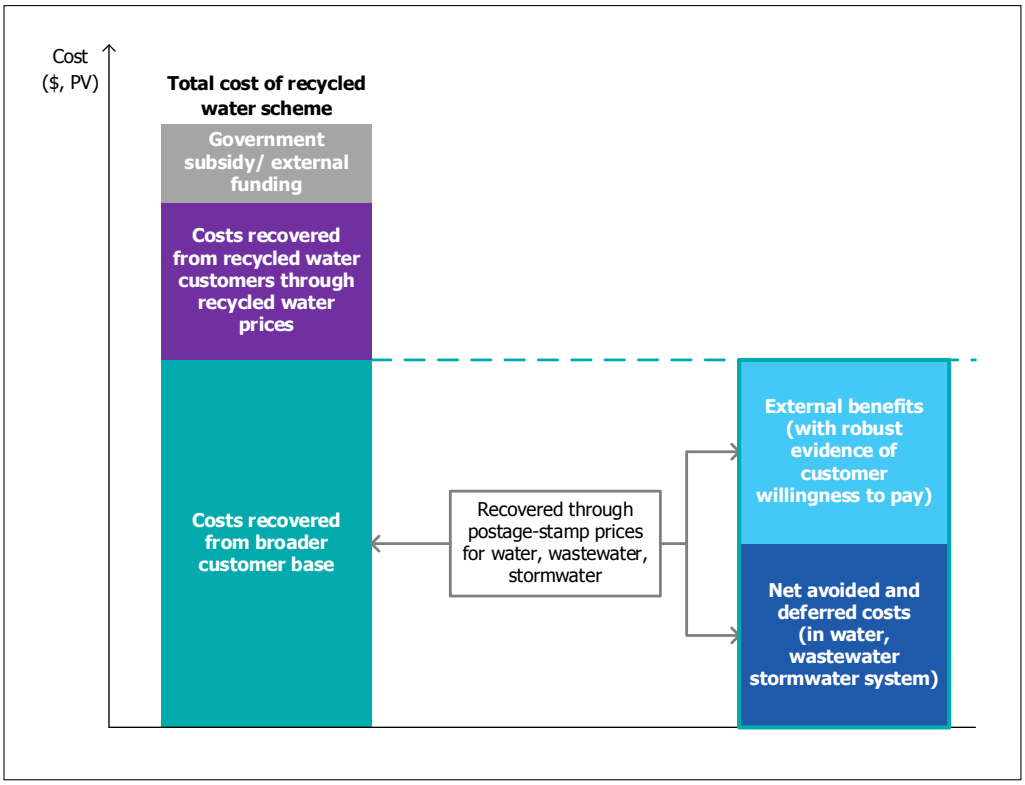
> *We note that when applying a set of principles for the first time it is an opportunity to test and, if necessary, clarify our approach.*

IPART has also recently issued a stakeholder update clarifying that Water utilities should *"invest in recycling when it is the best way of delivering the services and environmental outcomes that their customers want"*.[20] This provides additional clarity in how the pricing frameworks for public utilities recognise the benefits of recycling.

Hunter Water's understanding is that IPART's framework allows for the recovery of costs associated with recycled water schemes that are higher-cost than traditional servicing solutions from three sources (as shown in Figure 4).[21]

[18] Hunter Water, 2019 (b) and Productivity Commission, 2014, pp 44-47.
[19] IPART, 2019 (a), pp. 61.
[20] IPART, 2019 (b).
[21] In the current NSW policy setting where developer charges are set to zero.

Figure 4 IPART's framework for recovering the costs of recycled water services



Source: Hunter Water, based on various figures in IPART, 2019 (c)

A number of factors must be identified when apportioning the costs across the three contributors for the type of new recycled water project that we are proposing. In particular, the net avoided and deferred costs in the water, wastewater or stormwater system depend on:

- The extent to which the end-use customer is currently irrigating with drinking water, and the long-run marginal cost of water. These inputs to calculating the new avoided and deferred costs in the water system vary depending on the specific project.
- Avoided costs in the wastewater system, which may be imputed using the long-run marginal cost of wastewater.

We understand that ideally we would be proposing a specific recycled water project, including details on end-users and co-investors, full costings and expected revenues. Our experience is that end-use customer commitment is critical for the success delivery of, and ongoing uptake from, recycled water schemes. However, it is often difficult to secure, particularly in the absence of other commitments and financial contributions.

We also mindful of delivering on the preferences of our broader customer base in the most efficient way. Our Price Submission claim for $11.5 million towards a new recycled water project was based on preliminary negotiations with possible end-users of one scheme that could be delivered between 2020 and 2025. Reference to that scheme enabled us to calculate potential cost offsets (avoided costs) in the water system, which we combined with the contribution towards external benefits – effectively grouping all of the broader customer base to arrive at $11.5 million.

Since lodging our Price Submission, we have been continuing to explore opportunities for using recycled water for irrigation of parks, sporting grounds or gardens. This has resulted in us identifying more potential projects, which we intend to compare for efficiency and value for money in delivering the outcomes desired by our customers.

In the absence of nominating a specific recycled water project, we consider an allowance representing a reasonable contribution to external benefits is appropriate:

- Hunter Water wants to follow through on its commitment to deliver projects, which we said we would do if there was sufficient evidence of customer support. This was a core element or our willingness to pay study – it increased the realism of responses. We also seek to preserve the consequentiality and realism of responses by maintaining customer confidence.
- A firm additional funding source is likely to empower further discussion with potential end-use customers and is more likely to yield a timely commitment to uptake. We intend to pursue external funding sources, in case these are needed to bring recycled water charges to a level acceptable to end-use customers.

Hunter Water wishes to clarify that it is seeking $6 million over the price period as a contribution from the broader customer base towards the costs of a new recycled water scheme for irrigation of parks, sporting grounds or gardens. Our modelling shows that the bill impacts for a residential household (or non-residential equivalent) would be in the order of $0.87 per year to $0.98 per year.[22] At this bill impact level, 77% of survey respondents were willing to pay and Hunter Water must deliver at least 20 ML of recycled water for irrigation of parks, sporting grounds or gardens by 2025. We have a high level of confidence that this commitment can be met in the regulatory period.

We note that 57% of survey respondents were willing to pay $3.00 per household per year ($2017-18), on the condition that at least 150 ML of recycled water is used for irrigation of parks, sporting grounds or gardens by 2025. If we are able to cost-effectively deliver additional recycled water schemes that expand usage from 20 ML to at least 150 ML per year, we may seek to draw on this customer willingness to pay to support a further contribution from customers at the next price review. Our preliminary modelling suggests that willingness to pay findings support up to $15 million (up to $9 million more than we are proposing).

Hunter Water withdraws the claim for $5.5 million in recycled water cost offsets that we included in our July 2019 pricing proposal. We may seek IPART's guidance on a claim for cost offsets at a later time, depending on the characteristics of specific recycled water schemes and IPART's assessment of the LRMC estimates for water and wastewater.

3.2 Sense checking with triangulation

In the opinion of the Consumer Council for Water, the independent representative of household and business water consumers in England and Wales, validating willingness to pay results by triangulation with other data sources is a sign of good practice and robustness. Triangulation can take many forms, including comparison with results from other customer engagement activities, review of data from incidents and day-to-day feedback to contact centres.[23]

In the case of Hunter Water's proposed new recycled water project, the findings of the willingness to pay study can be cross-checked against the findings from customer engagement for the revision of the Lower Hunter Water Plan (LHWP).

The LHWP is a whole of government approach to ensure the Lower Hunter has a sustainable and resilient water system that can adapt and respond to change. Hunter Water is working with the NSW Government, key stakeholders and our community to review the LHWP so that it reflects our changing community values and priorities while effectively balancing water supply and demand in our region.

[22] The estimated bill impact per customer depends on the services they receive (water, wastewater, stormwater).
[23] Consumer Council for Water, 1 May 2019, Presentation to WSAA Workshop on Willingness to Pay, Melbourne.

We held a series of community deliberative forums to find out what our community values about water and what they think about the different supply and demand option types we are considering.

Phase I consisted of two deliberative forums, one in in Maitland on 23 October and one in Newcastle on 31 October 2018. A total of 138 people attended the forums. Phase II consisted of a further two deliberative forums, one in Newcastle on the 25 June and one in Maitland on the 26 June 2019. A total of 153 people attended the phase II forums.

The forums were conducted by Woolcott Research and Engagement on behalf of Hunter Water. The demographic breakdown of participants by phase is outlined in Figure 5.

All forums consisted of a mix of table discussions, presentations from the front, participant keypad voting, activity sheets and a feedback session. Participants spent most of the time working in small groups seated around a table. Independent table facilitators guided the discussions and recorded the main points.

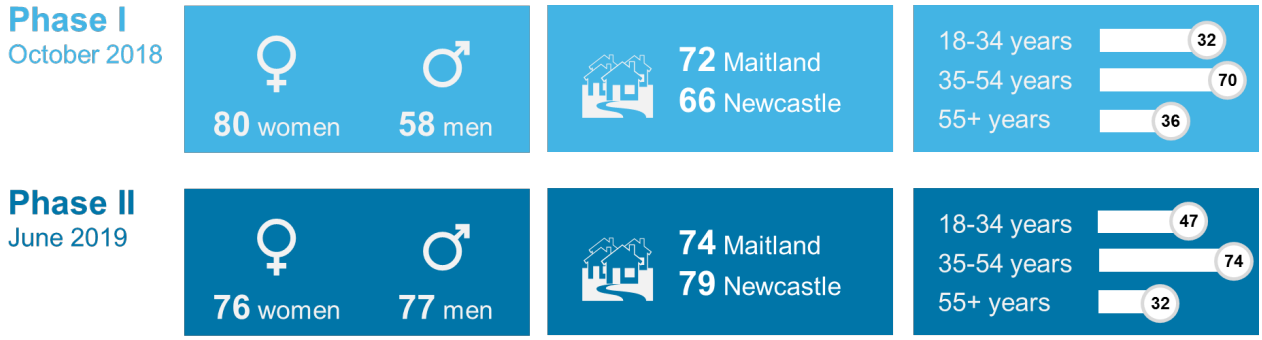
What is a deliberative forum?

A deliberative forum is a workshop-style event that facilitates two-way interaction between organisations and a representative cross-section of their community.

The process allows participants to digest complex information and discuss their understanding of this information with other participants before providing feedback to decision-makers.

Deliberative forums are a key engagement tool Hunter Water is using to help inform the review of the LHWP.

Figure 5 Demographic composition of LHWP deliberative forum participants



Source: Hunter Water, 2019 (c).

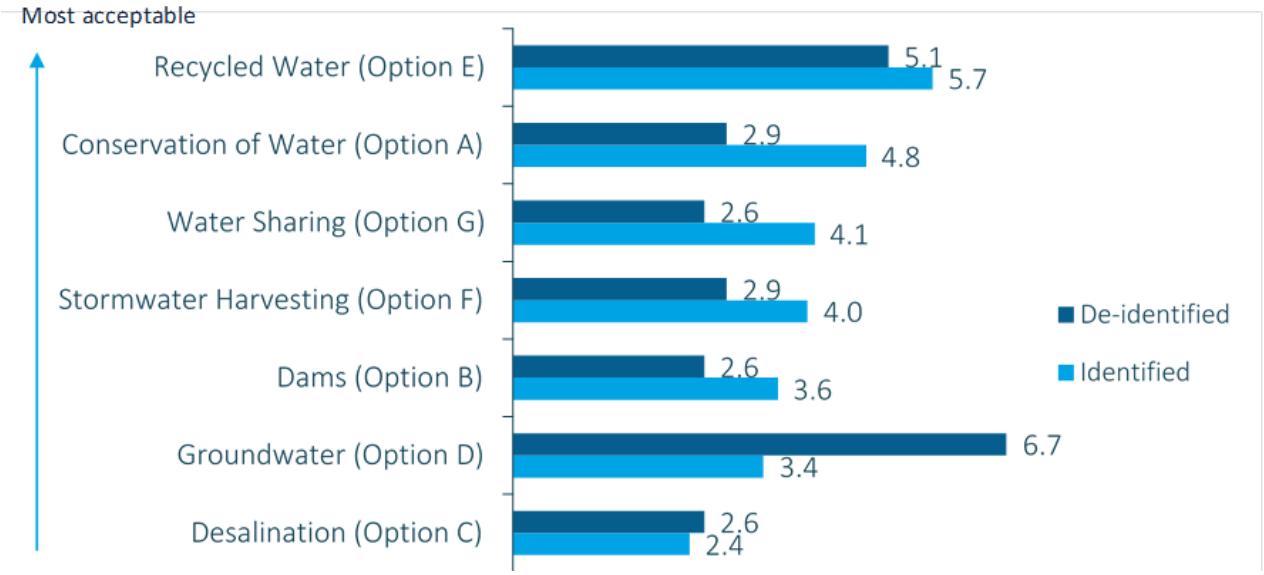
During Phase II forums, Participants were provided with information for each supply and demand option type (de-identified) showing how that option rated against key considerations (cost, environment, reliability, social impact) based on industry knowledge. This de-identified (or blind) activity was designed to elicit preferences for option types without bias from predispositions towards the option types.

Participants were asked to rank the de-identified option types from most to least acceptable. Recycled water was ranked equal second most preferred option (see Figure 6). Participants were then presented with information for each of the seven option types through presentations from the front and a series of fact sheets and asked to explore and discuss the positive and negative aspects of each.

Following exploration and discussion of the positive and negative aspects of each supply and demand option type, the option types were identified and participants were asked to rank the identified options from most to least acceptable. When the names of the options were revealed, recycled water emerged as the option with the highest mean preference score (see Figure 6).

It is clear from the LHWP that our community supports the use of recycled water for non-drinking purposes, based on a range of considerations, including costs.

Figure 6 Ranking and mean scores of de-identified compared with identified option types for LHWP



* Higher mean scores indicate higher ranking (i.e. greater acceptance or preference)
Source: Woolcott Research and Engagement, 2019.

3.3 Validity of non-use values

We sought expert advice from Marsden Jacob Associates, economists with expertise in non-market valuation, on non-use values (also known as passive use values or transaction values) of people that will not directly use or consume a good or service. The MJA advice is provided in Attachment A.

In summary it finds:

- The utility-theory foundations of transaction values are well established in welfare and public policy economics.
- Transaction values are observable in the real world, for example through donations to charitable causes. Around two thirds of people donating do not claim a tax deduction and therefore do not benefit directly. Their utility derives from the satisfaction of contributing to a cause they value, as expressed through promises of general outcomes that are not directly linked to a specific project.
- IPART's guidance on discretionary proposals and recycled water proposals allows for transaction values to be included as external benefits in seeking a contribution from the broader customer base.
- Hunter Water's proposed expenditure on a discretionary recycled water project is supported by clear evidence of customer willingness and ability to pay for what are essentially transaction (i.e. non-use) values. In addition to fulfilling the principles of best-practice willingness to pay studies, the goods and services described in the survey and conditions under which they would be supplied were consistent with real world examples of transaction values.

4. Abbreviations

Acronym	Term
DVAM	Demand volatility adjustment mechanism
IPART	Independent Pricing and Regulatory Tribunal (NSW)
LRMC	Long-run marginal cost
ML	Megalitres (ie. 1,000,000 litres)
NPV	Net present value
PIAC	Public Interest Advocacy Centre
PV	Present value
P90	A P90 cost estimate is one which has a 10% probability of being exceeded (i.e. a 90% probably of not being exceeded)
WACC	Weighted average cost of capital

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Customer willingness to pay for regulated non-use goods and services.

Hunter Water has asked us to advise whether customers can have a willingness and ability to pay for a good or service provided by Hunter Water that they will not benefit from directly by consuming, or being likely to consume.

Our advice below sets out evidence that shows the answer to this question is clearly yes. We show:

- The utility-theory foundations of transaction values are clearly established in welfare and public economics theory, and have been for more than 40 years.
- These values (called variously non-use, passive use values, transaction values and by other names) are widely observed through transactions every day in the real world.

We also comment on IPART's current approach to assessing discretionary expenditure proposals and recycled water proposals, including how IPART permits transaction values to be accounted for in regulated pricing.

Transaction values clearly exist. They are important to economic efficiency and efficient regulation.

That people derive value from goods and services that they may not directly experience or consume is well established in economic theory, economic evidence, and in the real world.

These values are variously called passive-use values, non-use values, transaction values and by other names. In this paper we refer to them as transaction values, consistent with the term attributable to Nobel Laureate economists Kenneth Arrow and Robert Solow (Arrow and Solow) from their 1993 NOAA report on contingent valuation.

In the NOAA report Arrow and Solow distinguish between consumption values and transaction values. Consumption value is realised when an individual's utility increases from consuming a good or service. Transaction value occurs when an individual's utility increases due to being involved in some form of transaction or activity. Like all measures of welfare change, transaction value reflects changes in the satisfaction of preferences. The preferences relevant to transaction values are preferences about an outcome that people care about.

Arrow and Solow cite charitable giving as an example of transaction value. The utility that an individual derives from charitable giving comes mostly from the act of giving rather than material changes that follow (for the

charitable giver) from the gift. The act of giving to a cause that the individual cares about provides the giver with utility. The Nobel Laureates make it clear that the validity of transaction value as a basis of utility is irrefutable; to exclude transaction values from economic assessment would violate standard foundations of utility-theory.

The utility-theory foundations of transaction values are well established in welfare and public economics. Carson *et al.* provide a clear contemporary introduction. Economic evaluation guidance from Australian and State agencies and Departments recognise the importance of transaction values in many public policy and regulatory decisions. The Office of Better Practice Regulation, the Productivity Commission, Commonwealth and State Cost-Benefit Guidance all recognise the importance of including transaction values in evaluation. TPP17-03 NSW Government Guide to Cost-Benefit Analysis includes comprehensive coverage of how to include transaction (non-use) values in economic evaluation.

There is clear evidence that transaction values exist in the real world. We see these transactions every day. Last year Australians donated in the order of $9 billion to charitable causes. Around one third of people donating claim the donation as a tax deduction. This means donations do not give financial tax benefits in most cases.

In many, if not most, cases the $9 billion of donations that were made in 2018 were based on promises of general outcomes that are not linked to a project directly. In many, if not most, cases the donations occur without any expectation that the persons donating will be a direct 'consumption' beneficiary of the investments made with their donation. Consider some examples here:

- Save the Children Australia promises they will use donations to deliver life-saving aid and development programs, and making sure children can be children, wherever they are. Save the Children Australia raised $30 million in cash donations based on this general outcome promise in 2017.
- The Nature Conservancy Australia promises they will make a difference to protect and conserve the Australian environment for the benefit of people and nature. They underpin this promise by saying (1) they'll get things done (2) they're trusted (3) they're efficient (4) they will make investments to have the greatest impact and (5) they're experts in their field. Based on this promise TNC Australia raised $5.5 million in donations from Australians in 2017-18, and more than $25 million over the last five years.

These Australian donations are clear evidence of transaction values occurring in the real world. They show that people are willing and able to pay for a good or service they will not consume, and are not direct beneficiaries of.

The donation payments are consistent with the foundations of utility-theory. People make the donation payments because it increases their utility to do so. The payment is made with the expectation that the money will be invested in a way that delivers outcomes consistent with what the organisation is promising. The payment is made without knowing the exact project the money goes to. There is no expectation that the payment is made to receive a benefit share of a specific outcome. The payees are more likely to give if the organisation is (1) reputable, (2) has a track record of delivering (3) are experts in their field (4) are providing services and outcomes that the person making the payment values, in general terms.

Hunter Water's willingness to pay survey elicited transaction payments from customers. The survey clearly demonstrated that a statistically significant, representative sample of existing customers are willing to pay for discretionary goods and services outcomes that they will not necessarily consume.

Hunter Water survey respondents clearly demonstrated they had willingness and ability to pay for some of the general outcomes promised by Hunter Water, not specific projects. These outcomes were described in similar in ways to the outcomes promised by Save the Children and TNC that raised more than $35 million from Australians in 2017-18.

Survey respondents committed to paying Hunter Water for the goods and services subject to specific promises made by Hunter Water that increased the consequentiality and incentive compatibility of their responses, including:

- That Hunter Water would make the investments in the next price period.
- On the understanding of the general type of outcomes that Hunter Water would deliver. In the case of recycled water these outcomes included upper and lower bounds on the recycled water volumes that would be delivered and upper and lower bounds on expected average cost of delivering these volumes.
- On the understanding that the exact outcomes and cost of achieving the outcomes were subject to uncertainty. As stated above, Hunter Water described the uncertainty and parameterised the uncertainty in quantities and prices through upper and lower bounds.
- On the understanding that Hunter Water would deliver the project, were technical experts in delivering these projects, and had an evidenced track record of delivery.

The conditions posed by Hunter Water asking for willingness and ability to pay are largely the same conditions that people made $9.2 billion in real donations on in Australia in 2018, and are almost identical to the TNC promises that raised $5.5 million in donations in 2017-18.

Accounting for transaction values in IPART's current approach to assessing discretionary expenditure proposals and recycled water proposals.

IPART's current position on pricing of recycled water extends the recognition of external benefits in the funding framework and allows for these to be recovered from the broader customer base.

IPART defines external benefits as positive externalities, including *"environmental, health, and liveability benefits, that arise as a result of recycled water schemes operating."* (pp55). IPART states that to quality for funding (of recycled water schemes) *"the onus would be on the public water utilities to identify external benefits and demonstrate customers' willingness-to-pay for them. Further, external benefits must be additional to those achieved through existing regulatory standards and specific to the provision of recycled water."* (pp55).

IPART notes that it may provide further guidance in the future on how regulated water utilities can demonstrate willingness to pay. This latter statement reflects that IPART, like Australian water utilities, is on a learning curve towards developing best practices for incorporating positive externalities in regulated pricing.

In our reading, IPART's guidance identifies that transaction values are relevant values, and should be included as external benefits in regulatory price submissions. Key points here are:

- **The positive externality examples identified by IPART are not exhaustive.** Transaction values are not included in the list of examples (pp55). However, IPART has not stated that transaction values are not valid positive externality values. Our view is that IPART would not exclude transaction values from the list of relevant positive externality values without clearly stating why they exclude these values. Excluding transaction values as valid positive externalities would violate standard foundations of utility-theory, would be inconsistent with Commonwealth and State Government economic and regulatory guidance. It would also be inconsistent with real world evidence discussed above. Given the weight of this evidence, we do not think IPART intends to exclude transaction values as valid measures of customer preference and willingness to pay.
- **IPART has stated they expect to see willingness and ability to pay.** They have not stated they do not expect to see willingness and ability to pay for transaction values. Hunter Water has provided IPART with clear evidence of customer willingness and ability to pay for recycled water transaction values. Each customer has clearly indicated their preferred level of the recycled water services from the choices offered and associated willingness to pay, even though they may not use these services directly. The manner in which the customer willingness to pay estimates were elicited satisfies all of the best-practice requirements set out by IPART in Box 5.1.
- **IPART treats positive externalities as cost offsets, not cost or benefit shares.** IPART's current recycled water pricing arrangements amend the regulatory framework to allow external benefits to be recovered from the broader customer base as cost offsets. Our view is this is a significant and positive regulatory amendment that helps place recycled water on a level playing field with traditional water, wastewater and stormwater infrastructure. In our reading, there is nothing in IPART's guidance that requires willingness to pay based on beneficiary or cost shares.
- **IPART uses a less prescriptive approach to recognising external benefits.** In our reading, a less prescriptive approach to recognising external benefits means that the approach should allow for all positive externalities to be included as cost offsets, where the regulated water utility can demonstrate that customers are willing to pay. This is consistent with IPART's view that an overly prescriptive approach will *"limit some external benefits from being adequately recognised."* (pp56). We agree with IPART. In the case of transaction values it would be overly prescriptive to require regulated utilities to tie transaction values back to specific project benefits, or benefit shares. This is because willingness to pay for transaction values does not need to be stated on this level of specificity to be consistent with utility-theory and observed real world behaviour, as discussed above.
- **Public water utilities are also likely to be in the best position to identify the external benefits that may arise from a recycled water scheme, and to elicit customer preferences about which benefits they value (pp56).** We agree with IPART's statement. Our reading of this statement is that IPART is accepting that if regulated utilities elicit willingness to pay for transaction values from customers for recycled water using best practices (Box 5.1) then IPART will accept that these transaction values are valid. To the extent that IPART does not accept robust evidence that Hunter Water customers have transaction values for recycled water, they would be implying that IPART understands Hunter Water customers' preferences better than Hunter Water, despite having no direct knowledge of customers' preferences, including transaction value preferences.
- **External benefits should be additional and specific to recycled water (pp57-58).** We agree with this statement as well. In our reading, IPART is recognising that transaction values should be additional and specific to recycled water. That is, Hunter Water customers are willing to pay a premium ($ per kilolitre)

on conventional supply for use of recycled water for irrigation of parks, sporting grounds and gardens in the Hunter region. Again, the recycled water premium is in addition to the cost for the use of potable water for this purpose, and reflects the transaction utility from knowing recycled water is being used. Hunter Water has satisfied these conditions in its willingness to pay survey. The willingness to pay evidence elicited by Hunter Water is demonstrably specific to recycled water and recycled water outcomes. Hunter Water customers were made aware that they were paying a premium to conventional water supply for the additional recycled water outcomes through inclusion of the statement in the survey "*Hunter Water will continue to invest in wastewater recycling schemes for irrigation when they cost less than drinking water…"*.

On the basis of the points above, our view is that there is nothing in IPARTs guidance that precludes transaction values from being included in recycled water pricing submissions as valid cost offsets to be funded from the broader customer base. Our view is that there are two fundamental questions for IPART:

(1) First is whether Hunter Water's consultation around recycled water satisfies provides clear evidence of customer willingness and ability to pay for recycled water transaction goods and services.
(2) Second is whether IPART is satisfied that Hunter Water has the ability to deliver the level of service beneath the upper bound average cost range used in the willingness to pay survey.

As discussed in this paper, our view is that Hunter Water has clearly satisfied the first test. We do not offer a view on the second test.

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